



भारत कोकिंग कोल लिमिटेड
(एक मिनिस्ट्रल कम्पनी)
(कोल इण्डिया लिमिटेड का एक अंग)
महाप्रबन्धक का कार्यालय
कुसुन्डा क्षेत्र, पो: कुसुन्डा, धनबाद, झारखण्ड

Ref No. BCCL/KA-6/Env./2016/ 28

Date: 30.04.2016

To,
The Director(s)
Ministry of Environment, Forest and Climate Change (MoEFCC),
(Govt. of India)
Regional Office (ECZ),
Bungalow No. A-2,
Shyamali Colony,
Ranchi - 834002

Sub : Six monthly compliance report on Environmental Clearance Conditions for the period from October'2015 to March'2016 in respect of Cluster-VI Group of mines, EC order no.: J-11015/183/2011-1A.II(M), dated 26-08-2013

Dear Sir,

Enclosed please find herewith six monthly compliance reports on environmental clearance conditions for the period from **October 2015 to March 2016** in respect of **Cluster-VI** Group of mines, **EC order no.: J-11015/183/2011-1A.II(M), dated 26-08-2013** for your kind perusal.

With regards,

Encl.: as above with soft copy (CD)

General Manager
Kusunda Area, BCCL

Copy:

- (1) Director, 1A Monitoring Cell,
Paryavaran Bhawan,
CGO Complex, New Delhi- 110003
- (2) The Member Secretary,
Jharkhand State Pollution Control Board,
TA Division Building, HEC, Dhurwa, Ranchi-834004
- (3) General Manager, Kusunda Area
- (4) Dy.GM(Environment), BCCL, Koyla Bhawan, Dhanbad
- (5) Office copy

General Manager
KUSUNDA AREA-VI

COMPLIANCE OF EC CONDITIONS of CLUSTER-VI

(October'15 to March'16)

Sl. no.	A. Specific Conditions by MOEF:	Compliance
i	The maximum production from the two opencast section in the cluster shall not exceed beyond that for which environmental clearance has been granted.	The approved normative production and peak production for East Bassuriya OC and Gondudih Khas Kusunda OC under Kusunda Area are total 3.50 MTPA & 4.55 MTPA respectively and for whole cluster consisting of East Bassuriya Colliery, Bassuriya Colliery, Gondudih Khas Kusunda Colliery and Godhur Colliery, that figure is 5.87 MTPA and 7.631 MTPA respectively. Total production of all mines of the cluster-VI in 2015-'16 is 1.091 MT which is well within the limit.
ii	The two nallahs passing through the mines should be preserved and made functional to drain the water.	Complied. In every year, before monsoon the nallahs are made clear of any obstacles to ensure proper draining of water.
iii	The coal transport to the siding will continue by road to the siding within 2 km with payload loader loading into Rly. Wagons for a period of 5 years by which time the proposed silo in Rly. Siding not being affected in the Jharia Action Plan will be constructed for RLS loading into railway wagons.	Coal transport to siding is being done by road to siding with payload loader loading into railway wagons.
iv	As subsidence is on higher side in Godhur colliery, special attention should be given for control and monitoring of subsidence.	For control and monitoring of threat of subsidence at fire affected area within Godhur lease hold special attention has been made by mine management. JRDA has completed survey the basties at fire affected area for evacuation & rehabilitation of the inhabitants under Jharia Master Plan and partially distributed Identity Cards, but evacuation of non-BCCL persons have not yet been done by JRDA. Colliery Management have allotted quarters at other safe place to employees residing at/near fire affected area for their early evacuation and accordingly shifting of employees is going on at the allotted quarters at newly constructed colonies at East Bassuriya and Jagjivan Nagar. Besides, one special team headed by senior mine official has been made at Colliery for inspection/supervision of the lease hold area of Godhur for early detection of any pot hole, fume and report to mine management for

		early action.
v	All old dumps will be filled back in mine voids. At the end of mining there should not be any OBD and should be only one void which shall not exceed 30 m deep.	It shall be complied. Action is being taken as specified in EMP.
vi	An increase in the CSR	BCCL is taking up activities from the HQ level and through its administrative areas for the implementation of CSR activities. For this purpose A CSR cell is functioning which is headed by General Manger(CSR) under the direct control of Director(Personnel) of the company. A details of CSR activities at Kusunda Area is enclosed Annexure-A 3.
vii	Dhanbad Action Plan, as CEPI, be implanted where ever is applicable.	Dhanbad Action Plan has been prepared in consultation with Jharkhand Pollution Control Board for entire BCCL and not clusterwise. It is being implemented comprehensively for all the mines of BCCL. Some of the salient actions of this cluster are enclosed as Annexure-E.
viii	Since the cluster is situated close to Dhanbad, thick green belt and residential areas should be done along the periphery of ML area. Avenue-plantation should be done along the roads which are used for coal transport and measures to arrest coal dust while transporting by covering the trucks and water sprinkling measures etc.	It is being complied. Plantation at degraded area is already being executed for development of green belts as per EC. Adequate water sprinkling is being done at coal transportation road regularly by mobile water sprinklers, and coal transportation is being done by covering trucks by tarpaulin as measures to control dust pollution. At degraded OB dumps at Gondudih eco-restoration work are in successful progress. Details of plantation done and programme of eco-restoration are enclosed as Annexure-B.
ix	Whereas laudable efforts have been made in drawing skill development programmes along with Planning Commission of Gol , all out efforts should be made to ensure that they are suitably employed either with the PP or elsewhere.	Training programmes for all employees are conducted regularly at mine vocational training centre as per Mine VT Rule and special training are being conducted at mine VT Centre, at HRD Deptt. of BCCL HQ and outside of Company for development of their skill. The required details are given in Annexure-F.
x	The measure to identify in the Environmental Plan for Cluster- VI groups of mine and the conditions given in this environmental clearance letter shall be dovetailed to the implementation of the Jharia Action Plan.	Master Plan activities are dovetailed with compliance of environmental clearance conditions. The master plan deals with fire control and rehabilitation activities of fire affected areas in the leasehold of BCCL.

		<p>By implementing complete digging out of fiery seams with water spraying in force as fire control measures air pollution and emission of Green House Gases (GHGs) from the fire affected areas are being prevented. Further rehabilitation of the families from the fire endangered area to the safe places is being taken-up with the help of State Govt. of Jharkhand.</p> <p>The Master plan is being implemented for BCCL as per the prioritization of fire and rehabilitation activities in approved Master Plan. The brief status of Rehabilitation and Fire control measures are enclosed (Annexure-D)</p>
xi	<p>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 VI 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 to prevent ingress of air (ventilation) in such areas, which may re-start fresh fires</p>	<p>NRSC had conducted survey of fires of Jharia coalfield by remote sensing methods using thermal infra-red data and land subsidence mapping of Jharia coalfield using Inter-ferometric SAR data. Total fire affected area in Jharia Coalfield has been reduced.</p> <p>Action is being taken as specified in EC and as per Jharia Master Plan. 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 prepare time-series map for monitoring of fire. NRSA will soon start the work</p> <p>For control and monitoring of threat of subsidence at fire affected area within Godhur lease hold special attention has been made by mine management. JRDA has completed survey the basties at fire affected area for evacuation & rehabilitation of the inhabitants under Jharia Master Plan and partially distributed Identity Cards, but evacuation of non-BCCL persons have not yet been done by JRDA. Colliery Management have allotted quarters at other safe place to employees residing at/near fire affected area for their early evacuation and accordingly shifting of employees is going on at the allotted quarters at newly constructed colonies at East Bassuriya and Jagjivan Nagar. Besides, one special team headed by senior mine official has been made at Colliery for inspection/supervision of the lease hold area of Godhur for early detection of any</p>

		pot hole, fume and report to mine management for early action. Under Jharia Master Plan, fire patch of V/VI/VII/VIII seam at Gareria Section of East Bassuriya, Kusunda Area about 1,70,000 m ³ have been filled by mitti/incombustible OB, rest void will be filled up by quarry OB of East Bassuriya OC.
xii	Underground mining should be taken up after completion of reclamation of Opencast mine area.	It shall be complied.
xiii	The OB material should be crushed like sand and be used for stowing in underground mines.	At present no underground mining work is going on in the mines of Kusunda Area.
xiv	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-VI shall be drawn up and implemented. The schedule of backfilling should be clearly brought out and submit the same to MoEF.	Calendar plan has been prepared and enclosed as annexure –A 1, 2. Mine closure plan as per the guidelines of Ministry of Coal has been prepared by Regional Institute –II, Central Mine planning and Design Institute, Dhanbad. The financial provisions required for the implementation of mine closure plan are being kept in accounts, and accordingly action are being taken.
xv	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 followed. Embankments have been constructed and maintained as specified in EC (Figure 1).
xvi	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 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).
xvii	There shall be no internal OB dumps. There will be 8 external OB Dumps covering an area of 32.84 Ha. The height of the dumps shall be 16 m and the total quantity shall be of 5.247 Mm ³ . The final mine voids will have an area of 66.76 ha (Filled up with water). with depth of 25 m bgl. The entire mined out area shall be re-vegetated. Areas where opencast mining was carried out and	It is being complied. Action is being taken as specified in EMP. Backfilling of OB is going on concurrent with mining and at the end of mining activity the area will be re-vegetated and reclaimed as per EMP. Plantation work have already been done with the help of DFO, Dhanbad. At degraded OB dump areas eco-restoration work is in successful progress. (Annexure-B)

	completed shall be reclaimed immediately thereafter. It was observed that most of the OB are reclaimed total area 441.24 ha at the end of mining where reclaimed external OB dump 32.84 ha and internal OB Dump 120.34 ha. Green Belt over an area of 66.12 ha. Density of tree plantation 2500 trees/ ha of plants which of and abandoned. The proponent should dump all the OB material in abandoned mines.	
xvii i	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. The small water bodies in OC shall be protected to the extent feasible and the embankment proposed along water body shall be strengthened with stone pitching.	It is being followed. Embankments have been constructed as specified in EC
xix	Active OB dumps near water bodies and rivers should be rehandled for backfilling abandoned mine voids. However, those which have been biologically reclaimed need not be disturbed.	No OB is being dumped near water bodies.
xx	Thick green belt shall be developed along undisturbed areas, mine boundary and in mine reclamation.	It is being complied. Yearly plantation is being done for development of green belts as per EC. For green belt development plantation / eco-restoration programme is enclosed in Annexure-B.
xxi	Specific mitigative measures identified for the Jharia Coalfields in the Environmental Action Plan prepared for Dhanbad as a critically polluted area and relevant for Cluster VI shall be implemented.	Dhanbad Action Plan has been prepared in consultation with Jharkhand Pollution Control Board for entire BCCL and not clusterwise. It is being implemented comprehensively for all the mines of BCCL. Some of the salient actions of this cluster are enclosed in Annexure-E.
xxii	The locations of monitoring stations in the Jharia Coalfields should be finalized in consultation with the Jharkhand State Pollution Control Board.	The locations of monitoring stations has been finalized in consultation with JSPCB and the Environmental monitoring of mines/units of BCCL as per the requirement of environmental Acts, Laws, Environmental Clearance conditions, etc . The monitoring work has been done by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad who is

		having CSIR laboratory recognized under the EP Rules . The work is now being carried out by CMPDIL.
xxii i	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 for the entire Jharia Coalfields. Mineralogical composition study should be undertaken on the composition of 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.	The work of monitoring of ambient environment has been done by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad having CSIR laboratory recognized under the EP Rules . At present CMPDI is doing the work. The proposal of the work of source apportionment study is under process.
xxiv	The Plan for conveyor-cum—rail for Cluster-VI should be dovetailed with Jharia Action Plan. The Committee desired that road transportation of coal during Phase—I should be by mechanically covered trucks, which should be introduced at the earliest. Coal dispatch shall be diverted from the present rail sidings to Rapid Loading System (RLS) soon after the construction and commissioning of the RLS at Maheshpur is completed. The railway siding order issued and same would come in 3 years. The details of same should be provided to ministry. The mode of transportation of coal by truck till Railway Siding should be by mechanically covered trucks.	CMPDIL, RI-II has been requested to conduct study and prepare the plan in this regard. By that time transportation is being done by covering vehicle with tarpaulin cover.
xxv	1387 no. of PAF's should be rehabilitated at cost of Rs 10,768.17 Lakhs as per the approved Jharia Action Plan.	It is being complied.

xxvi	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.	No underground mining work is going on in this Area. For control and monitoring of threat of subsidence at fire affected area within Godhur lease hold special attention has been made by mine management. JRDA has completed survey the basties at fire affected area for evacuation & rehabilitation of the inhabitants under Jharia Master Plan and partially distributed Identity Cards, but evacuation of non-BCCL persons have not yet been done by JRDA. Colliery Management have allotted quarters at other safe place to employees residing at/near fire affected area for their early evacuation and accordingly shifting of employees is going on at the allotted quarters at newly constructed colonies at East Bassuriya and Jagjivan Nagar. Besides, one special team headed by senior mine official has been made at Colliery for inspection/supervision of the lease hold area of Godhur for early detection of any pot hole, fume and report to mine management for early action.
xxvii	Sufficient coal pillars shall be left un extracted around the air shaft (within the subsidence influence area) to protect from any damage from subsidence, if any.	It shall be complied. Action is being taken as specified in EMP.
xxvi ii	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	It will be complied, if required
xxix	Depression due to subsidence resulting in water accumulating within the low lying areas shall be filled up or drained out by cutting drains.	It will be complied, if required
xxx	Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.	It has been complied and maintained
xxxi	No depillaring operation shall be carried out below the township/colony.	It will be complied,
xxxi i	A detailed CSR Action Plan shall be prepared for Cluster VI group of mines. As stated by the Proponent, it is formulating a detailed Corporate Social Responsibility (CSR) Action Plan through Tata Institute of Social Sciences (TISS), Mumbai which will consist of need-based base-line survey, CSR Action Plan, CSR Auditing and monitoring	CSR activities have been taken up on priority basis. The details of activities is enclosed in Annexure-A.3 .

	<p>mechanism etc. Director (Per.), BCCL. along with a team visited TISS/ National CSR Hub, Mumbai on 18th Jun, 2012 for finalizing the MoU with TISS and National CSR Hub for conducting base-line survey, empanelment of NGOs and formulating the project specific CSR action plan for BCCL. The Action Plan for Corporate Social Responsibility will include 5% of the retained earnings of the previous year subject to minimum of Rs. 5 per tonne of coal production of the previous year will be provided for Corporate Social Responsibility (CSR), an amount of Rs. 381.55 lakhs/year has been year marked for the CSR activities.</p>	
xxxi ii	<p>The area within Cluster VI ML existing as waste land and not being acquired shall be put for productive use under CSR and developed with fruit bearing and other useful species for the local communities. A 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 expenditures there on 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. Plantation should also be made in vacant area and along the road side so as to reduce dust pollution.</p>	<p>CSR activities have been taken up on priority basis.. The details of activities are enclosed .</p> <p>Plantation at degraded area and avenue plantation has been executed with the help of DFO, Dhanbad for development of green belts as per EC. Eco-restoration work at OB dump are in successful progress at degraded areas.</p> <p>Details of plantation to be done and programme of eco-restoration are enclosed in Annexure- B.</p>
xxxi v	<p>The mine water should be treated properly before supply to the villager.</p>	<p>Mine water is treated by water filter plant before supply to villagers. For which in Kusunda Area, three Pressure Filters, two Slow Sand Filter and two Rapid Gravity Filter Plant are there and at East Bassuriya New Colony, installation of two nos. Pressure Filters is under process. At Alkusa installation of two nos. of Pressure Filters are under proposal.</p>
xxx	<p>Details of transportation, CSR, R&R. and</p>	<p>being complied.</p>

v	implementation of environmental action plan for each of the clusters-VI should be brought out in a booklet form within a year and regularly updated.	
xxx vi	Central recreation park with herbal garden should be developed for use of all inhabitants.	It shall be complied.
xxx vii	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.	Being complied. The work of monitoring of ambient air and water has been done by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad having CSIR laboratory recognized under the EP Rules. Now the work is being carried out by CMPDI.
xxx viii	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.	<p>No ground water is being utilized for the purpose of industrial use. Mine water has been channelized through pipelines and through delivery for its use for the community purposes after filtration. Drinking water is being purchased from the Mineral Area Development Authority (MADA). Further for the utilization of mine water following actions has been taken by the company</p> <ol style="list-style-type: none"> 1. Installation of Pressure filters: In Kusunda Area, three Pressure Filters, two Slow Sand Filter and two Rapid Gravity Filter Plant are there. At East Bassuriya New Colony, installation of two nos. Pressure Filters is under process. At Alkusa installation of two nos. of Pressure Filters are under proposal. 2. Rain water Harvesting: to catch run-off water in colonies Rain water Harvesting is being done. BCCL has already developed rain water harvesting at Koylanagar Township In Kusunda Area, proposal for rain water harvesting at two colonies is under process from Civil Deptt.
xxx ix.	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.
xi	Regular monitoring of groundwater level and quality of the study area shall be carried out by	Regular monitoring of Ground water is being carried out by CMPDIL. Establishment of new piezometers is

	<p>establishing a network of existing wells and construction of new peizorneters. The monitoring for quantity shall be done four times a year in pre-monsoon(May), monsoon(August), post-monsoon(Novemer) 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.</p>	<p>under process. In this regard, CMPDIL has submitted a report titled "Location and design of Piezometers for Cluster of Mines of BCCL" and the design locations have been finalized by CMPDIL.</p>
xli	<p>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.</p>	<p>It shall be complied.</p>
xlii	<p>For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1:5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years(for any one particular season which is consistent in the time series), and the report submitted to MOEF and its Regional office at Bhubaneswar.</p>	<p>Presently a time series map of vegetation cover in the Jharia Coal Field is being carried out through CMPDI Ranchi using satellite imagery for every 3 years. CMPDI has started to prepare "Time series of land use maps based on satellite imagery of the core zone and buffer zone.</p>
xlili	<p>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 eco system 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;</p>	<p>CMPDI has prepared Mine Closure Plan for progressive mine closure activities which are being implemented at mines. Final Mine Closure Plan will be prepared.</p>
xliv	<p>A separate management structure for implementing environment policy and socio-economic issues and the capacity building required in this regard.</p>	<p>A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives has been established in Headquarters. They are also trained in</p>

		<p>ecological restoration, sustainable development, rainwater harvesting methods etc. At the Area level, one Executive in each area has also been nominated as Nodal Officer (Environment) under General Manager of Area and at Project level, concerned Safety Officer under Project Officer is looking after the environment related jobs and 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. HoD (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.</p> <p>The team is multidisciplinary and very much motivated under the guidance of company's CMD and Director (Technical) . Further capacity building at both corporate and operating level is being done.</p>
Xlv	Corporate Environment Responsibility.	
(a.)	The Company shall have a well laid down Environment Policy approved by the Board of Directors.	A well defined Corporate Environment Policy has already been laid down and approved by the Board of Directors. This is also posted on BCCL website.
(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.	Complied.
(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.	A hierarchical system of the company to deal with environmental issues from corporate level to mine level already exists.
(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.	Being complied.
B.	<u>General Conditions</u>	

i	No change in mining technology and scope of working shall be made without 'prior approval of the Ministry of Environment and Forests.	Being followed.
ii	No change in the calendar plan of production for quantum of mineral coal shall be made.	Being followed. Production of clusters are well within the production capacity as per EC.
iii	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM10, PM2.5, SO2 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.	Air quality monitoring stations and monitoring of ambient environment has been established after consultation with State Pollution Control Board. Central Institute of Mining & Fuel Research (CIMFR), Dhanbad having CSIR laboratory recognized under the EP Rules have done work. CIMFR has done the monitoring work. CMPDIL is presently doing the monitoring work.
iv	Data on ambient air quality (PM10, PM 25, SO2 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 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 with ear plugs/muffs.	Being complied

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 followed. Mine water is being reutilized for industrial purposes (sprinkling, cooling/ fire control etc.)
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. As part of DAP condition, actions are being taken for its implementation.
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.	Air quality monitoring stations and monitoring of ambient environment has been established after consultation with State Pollution Control Board. Central Institute of Mining & Fuel Research (CIMFR), Dhanbad having CSIR laboratory recognized under the EP Rules have done work and now the monitoring work is being carried out by CMPDIL.
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.	Being Complied. A separate full fledged Human Resource Development Deptt. is conducting regular training programme on these issues. Apart from this Vocational Training Centers are existing in the Area 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 an records maintained thereof. The quality of environment due to outsourcing and he health and safety issues of the outsourced manpower should be addressed by the company white outsourcing.	Initial Medical Examination (IME) and Periodical Medical Examination (PME) of all the personnel of the Area is carried out at Bhuli PME Centre, Bhuli, Dhanbad as per the Statutes and guidelines of Director General of Mines Safety (DGMS). Data enclosed as Annexure-F
xi	A separate environmental management cell with suitable qualified personnel shall be set up under	A full-fledged Environment Department, headed by HoD (Environment) along with a suitable qualified

	the control of a Senior Executive, who will report directly to the Head of the company.	multidisciplinary team of executives has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the Area level, one Executive in each area has also been nominated as Nodal Officer (Environment) under General Manager of Area and at Project level, concerned Safety Officer under Project Officer is looking after the environment related jobs and 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. HoD(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.
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	Being complied
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 www.envfor.nic.in .	It has been complied.
xiv	A copy of the environmental clearance letter shall be marked to concern Panchayat /Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on company's website.	Complied.




xv	A copy of the environmental clearance letter shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days.	Complied.
xvi	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance 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 PM10, PM2.5, SO2 and NO,, (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.	Complied.
xvii	The project proponent shall submit six monthly compliance reports on status of compliance the stipulated environmental clearance conditions (both in hard copy and in e-mail) to view respective Regional Office of the Ministry, respective Zonal Office s of CPCB and the SPCB.	Being complied in time.
xvii i	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.	Shall be complied.
xix	The Environmental statement for each financial year ending 31 March in Form —V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules,1986,as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF by E-mail.	Being complied.

6.	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report so also during their presentation to the EAC.	Agreed
7.	The proponent is required to obtain all necessary clearances/approvals that may be required before the start of the project.	Agreed
8.	The Ministry or any other competent authority may stipulate any further condition for environmental protection.	Agreed
9.	Failure to comply with any of the conditions mentioned above may result in the withdrawal of this clearance and attract the provisions of the Environment (Protection) Act, 1986.	Agreed
10.	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981. The Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.	It is being complied
11.	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.	Agreed

Annexure-A

1. Coal Production of the Cluster will be well within the limit for which environmental clearance has been granted.

2. **OB BACKFILLING PROGRAMME**

Backfilling Programme: (in Mm³)

Year	Gondudih Khas Kusunda OC	East Bassuriya OC	Godhur Mixed	Total
2016-17	2.5	0.20	0.15	2.85
2017-18	2.58	0.20	0.54	3.32
2018-19	3.0	0.20	0.54	3.74
2019-20	3.0	0.20	0.53	3.73
2020-21	3.5	0.20	0.50	4.20


3. CSR ACTIVITIES OF BCCL

Bharat Coking Coal Limited (BCCL) is committed to good corporate citizenship and makes constant efforts to build and nurture long lasting relationships with members of the society in general and it's peripheral communities in particular.

BCCL is taking up activities from the HQ level and through its administrative areas for the implementation of CSR activities. For this purpose A CSR cell is functioning which is headed by General Manger(CSR) under the direct control of Director(Personnel) of the company.

The CSR activities presently being done by BCCL

- To meet the acute shortage of drinking water in peripheral villages' drinking Water is provided through deep borewells, tubewells, pumps/motors, in the peripheral villages of BCCL. Water supply through pipeline, through water tanker is provided also to the villages. Mine water is supplied after proper filtration in Filter Plants.
- **Education:** BCCL adopts a multi-pronged approach to promote quality education in backward areas. The measures taken by BCCL comprise Construction, Extension, and Renovation of school buildings etc are done to promote quality education in the nearby villages. BCCL is Extending financial aid for educational facilities to 83 nos. Private Committee Managed schools. Measures are taken to promote women literacy and carrier development.
- **Health Care:** BCCL Conducts medical/health camps for dwellers of peripheral villages for rendering free medical consultancy. CSR Clinics, wellness clinics, artificial limbs centers are organized for the benefit of the needy section of the society.. Mobile medical vans are deployed as special arrangement for medical services. AIDS awareness camps are organized as special drive to develop awareness and to render free consultancy. In Kusunda Area many medical /health camps in peripheral villages and in collieries and various awareness programmes have already been conducted, and is being conducted regularly by Area Medical Team.
- **Occupational health:** awareness programme are organized.
- **Other Welfare Activities:** this includes Construction / renovation of Community Halls, construction / repair of roads, construction of Health-sub centres, construction of drain, construction of Chhat Ghat in the ponds, Construction of Boundary wall, providing Choupal for community gatherings, etc.
- **Mashla Chakki centres :** Mashla Chakki centres has been established with machines to promote self employment.
- **Blankets:** During winter, Blankets are distributed among poor section of the society.
- **Sports & Cultural:** Various activities are organized to propagate sports and cultures. Sports/games items and instruments are also provided with play ground.
- **Village adoption:** Lahbera – A SC/ST village nearby Dhansar Mine has been adopted for its all round development and a number of development activities have been carried out including school, health care and Ambulance facility, Mashla Chakki Centre, Community Centre, Play ground, etc.



IN KUSUNDA AREA :

A lot of CSR activities have been done in the peripheral villages in the field of medical and civil and welfare.

Health Campaigning at surrounding villages by MMV (Mobile Medical Van) :

Year	No. of MMV camps	Beneficiaries
2013-'14	298	11,171 patients
2014-'15	306	11,884 patients
2015-'16	380	11,013 patients
Special Health Camps in 2015-'16	5	354 patients
CSR Clinic 2015-'16		5842 patients
Wellness Clinic 2015-'16		6244 patients

In 2013-'14 & 2014-'15 and 2015-16 following civil work have been completed under CSR Activity

- Construction of compound wall for Lahbera School at Dhansar -- work completed
- Deeping of Pond at Lahbera Basti at Dhansar -- work completed
- Constr. of pcc road from Dom tola to Kali Mandir at Barki Bowa Village -- work completed
- Constr. of pcc road from near house of Vikash Rajak to main road at Satitand Village -- work completed
- Constr. of pcc road from Parduman Singh Chowk to near house of Sri Kishore Pandey at Ranguni Panchayat -- work completed
- Constr. of Yatri shed at Dutta Tola near Hanuman Mandir of Ranguni Panchayat -- work completed
- Constr. of boundary wall , Chabutra and a shed near Gram Dewata at Dhansar -- work completed
- Construction of PCC road in Lahbera Basti at Dhansar -- work completed
- Construction of 318 toilets in 179 schools in Chaibasa has been undertaken by Kusunda Area under the Pradhan Mantri Swatchh Vidyalaya Yojana . Construction of toilets in 25 boys' school, 15 girls' schools and 139 Co-education School have been undertaken. -- Out of 318, 234 toilets have been completed. Rest are to be completed soon in 2016-17.

Financial assistance by Kusunda Area to Private Committee managed Schools in villages during the financial year 2015-'16:

(fig.provided by Area Finance Deptt., Kusunda Area)

Name of School	Total Amount (Rs.) in 2015-'16
L.P.School, Dhansar Vikash H.A.School, Bassuriya Bal Vikash P.V.Industry CO Sanjay Gandhi S.M.V.,Godhur Gandhi M.K.E.S.E.,Bassuriya Madhya Vidyalay, Kurmidih Bassuriya Vidyalay,Bassuriya Shishu Vikash M.Vidyalay J.N.Vidyalay, Gondudih DAV School, Kusunda	29,73,750.00

Annexure-B

- Plantation- At Gondudih- Khas Kusunda Colliery Plantation has been done by DFO, Dhanbad at about 10.5 Ha area of OB dump. 500 no. bamboo-gabion plantation have been done. At the side of rly. siding plantation work is being going on. At about 2.0 Ha Ecological restoration site total about 5900 no. plants and plenty of grass-seeds have been planted successfully with encouraging results. At new eco-restoration site (more than 1.79 Ha OB dump- area) about 2400 plants along with seeds of grass and shrubs have spread over during 2015-'16 successfully.

PLANTATION/ECOLOGICAL-RESTORATION PROGRAMME

Plantation/Ecological Restoration Programme (Cluster-VI & part of Cluster-VII mines of Kusunda Area) :

YEAR	CLUSTER VI & CLUSTER VII(Part under Kusunda Area)	No.of saplings/plants
2016-17	2.00 Ha(approx.)	5000
2017-18	4.00 Ha(approx.)	10000
2018-19	6.00 Ha(approx.)	15000
2019-20	6.00 Ha(approx.)	15000
2020-21	6.00 Ha(approx.)	15000



Annexure-C

(AS PER ANALYSIS REPORT SUBMITTED BY CIMFR, DHANBAD)

Samples collected and analysed by CIMFR, Dhanbad at the Monitoring Stations located and marked with the help of JSPCB

1. ANALYSIS REPORT OF WATER

Location code	Location name	Description	Date	Odour	pH	Fe (mg/l)	Cl (mg/l)	TDS (mg/l)	SO ₄ (mg/l)	NO ₃ (mg/l)	AS (mg/l)	Pb (mg/l)	Zn (mg/l)
SW-14	Ekra nala	Surface water(U/S)	11.06.2015	Agreeable	7.24	2.570	26.3	779	559.4	3.01	0.005	<0.001	0.174
SW-15	Ekra nala	Surface water(U/S of clstr-v)	11.06.2015	Agreeable	7.38	2.247	23.48	833	574.3	2.01	0.021	0.009	0.187
GW-6	Near Bassuriya	Ground water(tube well)	11.06.2015	Agreeable	7.22	0.868	13.4	395	29.11	<0.01	0.003	<0.001	0.068

Location code	Location name	Description	Period of sampling	pH value	COD, mg/l	TSS, mg/l	Oil & Grease, mg/l
MW-6	East Bassuriya	Mine Effluent water	06.06.2015	7.32	49.7	55.9	3.56

2. ANALYSIS REPORT OF AMBIENT AIR QUALITY

Zone	Location	Period	PM _{2.5}	PM ₁₀	SO ₂	NO ₂
Core	Manager's Office, Bassuriya (A-9)	10.04.2015	65.4	156.1	29.14	49.30
		05.05.2015	66.3	132.4	29.8	50.1
		04.06.2015	43.0	129.8	27.0	46.5
Buffer	Mine Office, Nichitpur (A-8)	21.04.2015	58.9	151.3	27.9	45.6
		07.05.2015	32.1	148.1	29.8	48.2
		29.05.2015	35.0	99.5	38.6	50.1
	GM Office,PB Area (A-16)	08.04.2015	48.2	115.0	25.1	45.6
		24.04.2015	54.1	90.9	30.2	50.1
		15.05.2015	50.7	89.8	23.9	48.5

Action taken : (1) regular and sufficient water spraying by mobile tankers and through pipe lines is done at roads(haul roads, transportation roads, etc.), at all strategic dust generating points such as loading, un-loading,transfer points etc.

(2) covered coal transportation by trucks is already implemented

(3) plantation/eco-restoration at non-coal bearing/decoaled OB dump site is being done.

(4) making transportation road pucca and its regular maintenance

(5) use of dust extractors at drill m/c.

etc.

Note: Pollution inventory of different sources within the area apart from the coal mining is required to be carried out actual assessment of pollution load by mining and other sources.



ANNEXURE--- D

STATUS OF JHARIA MASTER PLAN DOVETAILED WITH ENVIRONMENT CLEARANCE CONDITIONS

Rehabilitation and Fire control measures

Socio-economic Survey :

Survey of fire affected families (non-BCCL) at Kusunda Area has been nearly completed by JRDA and distribution of ID Card has been partially done by JRDA.

Accommodation provided in Satellite Township:

- Till about 946 quarters at newly constructed colonies at East Bassuriya and at Jagjivan Nagar have been allotted to the employees residing at coal bearing/fire affected areas in different collieries under Kusunda Area and out of which 493 employees have been shifted. More quarters are under construction for phasewise shifting of employees.
- In temporary rehabilitation site at decoaled zone of East Bassuriya about 28 PAF/encroachers have been shifted.
- Non-BCCL families will be shifted by JRDA.

Status of fire dealing :

Under Master Plan, many Fire schemes have been formulated / prepared /implemented for dealing fires sites spread in collieries of BCCL. Further for expediting the fire dealing process, excavation methods has been resorted to by deploying Hired HEMM at various mines of BCCL. Total digging out of fiery coal has been adopted for dealing of fire.

In fire patch of V/VI/VII/VIII seam of Gareria Secn. at East Bassuriya, about 1,70,000 cu.m. mitti and non-combustible material has been filled, rest will be filled by quarry OB .

NRSC has conducted survey of fires of Jharia coalfield by remote sensing methods using thermal infra-red data and land subsidence mapping of Jharia coalfield using Inter-ferometric SAR data. Total fire affected area in Jharia Coalfield has been reduced from 9.0 sq.km to 2.18 sq.km. This could be achieved only due to the successful "excavation method i.e. digging out of fiery coal" adopted by BCCL.

At Kusunda Colliery and Ena OC, total firey coal are being digged out as a measure of fire dealing with the deployment of hired HEMM. The underground workings of Alkusa Colliery has been sealed due to fire threats after taking measures to control UG fire as per CMR'57 DGMS guidelines. The coal reserve of Alkusa Colliery will be extracted from Kusunda OC side. For control and monitoring of threat of subsidence at fire affected area within Godhur lease hold special attention has been made by mine management.



ANNEXURE-E

COMPLIANCE OF DHANBAD ACTION PLAN

(1) Covering of loaded transport vehicles

It has been complied. The clause of covering of loaded coal transport vehicle has also been incorporated in the transport agreement/ contract.

(2) Coal transport roads shall be made pucca

In 2015-16 about 80 m pucca road near Kusunda Office has been constructed.

Proposals for 2016-17 include:

- About 90 m block concretized road construction from NH-32 and Kusunda office connecting point to Kusunda Office.
- About 90 m block concretized road construction from NH-32 connecting point to old auto workshop.
- About 125 m of WBM road construction from Godhur office up to Kali Mandir
- About 300 m of two lane WBM road at/ near Godhur CHP.

(3) All drillings to be done with dust containment and suppression systems. Sprinklers will be installed including at all coal stock & sidings

DUST EXTRACTOR: Regarding drilling it has already been complied in all OC mines. Drill machines are having OEM fitted DUST EXTRACTION system.

Complied. Water sprinkling at all coal stock and sidings is being done by mobile water tankers and through pipe lines. Proposal for installation of fixed sprinklers at siding is under process.

(4) MOBILE SPRINKLERS

Sl. no.	Mine	Haul road length in Km	No. of mobile sprinklers	Total Capacity(KL)	Trips per day
1	Kusunda OC + Godhur mixed	6.5-7.0	6	3-20 KL, 3-12KL	35 trips/day
2	Dhansar/Industry	3.5-4.0	6	2-12KL each, 1-20KL, 3-8KL each	20 trips/day
3	Gondudih KKC	5.0-6.0	3	60	15 trips each/day,
4	Ena	1.5-2.5	1	9	4 trips /day,
5.	East Bassuriya	2.5-2.8	1	12KL	6 trips each/day

(5) The direction of surface run-off of the premises of collieries shall be diverted to created water bodies.

Creation of water bodies in coal bearing area will pose safety threats to nearby mine and it will be violation of mines act. This will also create grave danger of inundation of the adjacent mines since the mines are 100 years old and interconnected with each other. So this action cannot be complied.



However to catch run-off water in colonies proposal for Rain water Harvesting in two colonies is under process

(6) Dealing of mine fires

A Master plan for Dealing with fires and subsidence and rehabilitation in the Leasehold of BCCL has been approved by Govt. of India vide letter no- 22020/1/2005-CRC dated 12 08 09. In fire patch of V/VI/VII/VIII seam of Gareria Secn. At East Bassuriya about 1, 70,000 cu.m. mitti and non-combustible material has been filled, rest will be filled by quarry OB .

In Kusunda OC and Ena OC, fire patches are being dug out for the purpose of dealing with fire and combustible materials are extracted out to save the coal from burning and to stop further spread of the fire. Once the total fiery coal is dug-out/excavated there will be no more chance of re-starting of fresh/spreading of fire into other areas.

At Alkusa mine, measures have been taken as per CMR'57 and DGMS Guidelines to control ug fire and entrances have been filled/sealed to stop ingress of air into fire affected area.

(7) The waste water shall be passed through oil separator-cum-filtration system

-- It shall be complied

(8) The removed Obs shall be utilized for low land filling or for making roads.

Complied. Removed OB is used for low land filling and for making roads as and when required.

(9) Tree plantation on the dumps

Complied. 26,250 nos. saplings planted at 10.5 Ha OB dump area and 500 nos.plants as avenue plantation done by DFO, Dhanbad.

In Gondudih-Khas Kusunda Mine. Ecological restoration work in 2.0 Ha OB dump area at Gondudih is in successful progress; total 5500 plants has been planted there. At new eco-restoration site (more than 1.79 Ha OB dump- area) about 2400 plants along with seeds of grass and shrubs have spread over during 2015-'16 successfully.

(10) All hazardous wastes shall be disposed off

Complied.

1. All units have applied for authorization as per Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules.
2. Burnt oil is used for lubrication of haulage system in underground mine, thus reducing quantity required to be disposed. Remaining burnt/used oil is disposed as per rule.
3. Disposal of Hazardous waste, burnt Oil / batteries is being done through E-auctioning to authorized recycler/ re-processor having valid authorization from CPCB/ SPCB. Return are also being filed.

(11) Monitoring and Reporting six monthly

- (12)** Monitoring work has been done by CIMFR, Dhanbad as per work order issued by BCCL HQ.

(12) Introduction of GIS/ GPS

CMPDI, HQ has been given the job of satellite surveillance of the Jharia coal field through NRSA Hyderabad and the information is being uploaded in the website.

ANNEXURE-F

KUSUNDA AREA

Status of Periodical Medical Examination & Vocational Training

Mines under Cluster-VI	Total PME done for the period April'15 to March.'16	Vocational Training done for the period April'15 to March.'16
Bassuriya, East Bassuriya, Godhur and Gondudih Khas Kusunda	637	166



Figure 1 *Stone Pitching/embankment at Kari Jore near Godhur Colliery.*

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**ENVIRONMENTAL MONITORING REPORT
OF
BHARAT COKING COAL LIMITED,
CLUSTER – VI**

(FOR THE Q.E. MARCH, 2016)

E. C. no. J-11015/183/2011-IA.II (M) dated 26.08.2013-

June, 2016



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CLUSTER - VI

(FOR THE Q.E. March, 2016)

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ENVIRONMENTAL MONITORING REPORT OF BHARAT COKING COAL LIMITED CLUSTER – VI

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CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

EXECUTIVE SUMMARY

1.0 Introduction

The purpose of environmental monitoring is to assess the quality of various attributes that affects the fauna and flora. In accordance with the 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 is operating Underground and Opencast Mines in Jharia Coalfield (JCF) is a part of Gondwana Coalfields located in Dhanbad district of Jharkhand, the JCF is bounded by 23°37' N to 23°52' N latitudes and 86°09' E to 86°30' E longitude occupying an area of 450 Sq.km. BCCL has awarded Environmental monitoring work of Jharia Coalfield (JCF) to Central Mine Planning & Design Institute Limited (CMPDIL). The environmental monitoring has been carried out as per the conditions laid down by the MoEFCC while granting environmental clearance of project, consent letter issued by the respective SPCB, and other statutory requirements.

2.0 Sampling location and rationale

2.1 Ambient air sampling locations

The ambient air quality monitoring stations were selected to represent core, buffer zone area. The rationale has been based on the guidelines stipulated by MoEFCC, consent letter of SPCB, as well as other statutory requirements.

2.2 Water sampling stations

The Water sampling stations were selected for mine sump water, drinking water supply, well/ Hand pump water and also surface water samples.

2.3 Noise level monitoring locations

Noise levels vary depending on the various activities in mining areas. The monitoring of noise level in different locations will be helpful to take appropriate mitigating measures. The noise levels were recorded in mining area, washery and in residential area.

3.0 Methodology of sampling and analysis

3.1 Ambient air quality

Parameters chosen for assessment of ambient air quality were Particulate Matter (PM₁₀), Fine Particulate Matter (PM_{2.5}), Sulphur Di-oxide (SO₂) and Nitrogen Oxides (NO_x). Respirable Dust Samplers (RDS) and Fine Dust Sampler (PM_{2.5} sampler) were used for sampling of PM₁₀, SO₂, & NO_x and Fine Dust Sampler (PM_{2.5} sampler) were used for sampling of PM_{2.5} at 24 hours interval once in a fortnight and the same for the gaseous pollutants. Also in compliance of the EC conditions Half yearly analysis of Heavy metals has been carried out for Arsenic (As), Cadmium (Cd), Chromium (Cr), Mercury (Hg), Nickel (Ni), Lead (Pb). The samples were analyzed in Environmental Laboratory of CMPDI, RI-I, Asansol.

3.2 Water quality

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

3.3 Noise level monitoring

Noise level measurements in form of 'L_{EQ}' were taken using Integrated Data Logging Sound Level Meter. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB (A).

4.0 Results and interpretations

4.1 Air quality

It has been seen from the analysis results that the 24 hours average concentration parameters like PM₁₀, PM_{2.5}, SO₂ and NO_x are mostly within the permissible limits in all sampling locations as per MoEFCC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines and National Ambient Air Quality Standard - 2009. Sometimes the concentration of PM₁₀ & PM_{2.5} exceeds the limits due to heavy public traffic, poor road condition, coke oven plants, burning of coal by surrounding habitants, brick making, municipal waste dumps and industries like Steel Plant, thermal Plants including their fly ash etc.

4.2 Water quality

The test results indicate that the major parameters compared with MoEFCC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines, IS.10500/2012 (Drinking water) and IS: 2296 (Surface water), were within permissible limits.

4.3 Noise Level

During the noise level survey it has been observed that the noise level in the sampling locations is within the permissible limits prescribed as per MoEFCC Gazette Notification No. GSR 742(E) dt 25.09.2000 Standards for Coal Mines for Industrial Area and Noise pollution (Regulation and Control) Rules, 2000.

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.

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-VI is situated in the Northern part of the Jharia coalfield. It includes a group of 4 Mines (viz. East Baseriya Colliery (OC), Baseriya colliery (UG), Gondudih Khas Kusunda colliery (OC) and Godhur Colliery (Mixed). The Cluster – VI is situated about 25 - 30 kms from Dhanbad Railway Station. The mines of this Cluster – VI 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 Sendra and Ekra nalas.
- 1.2 The Cluster-VI is designed to produce 5.87 MTPA (normative) and 7.631 MTPA (peak) capacity of coal. The average grade of coal W – III & W- IV.

The Project has Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEFCC) for a rated capacity 5.87 MTPA (normative) and 7.631 MTPA (peak) capacity of coal production vide letter no. J-11015/183/2011-IA.II (M) dated 26th August, 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 PM₁₀, PM_{2.5}, SO₂, NO_x monitoring. Location of the stations has been decided based on the meteorological data, topographical features and

environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.

In compliance of these conditions the Environmental Monitoring has been carried out & report prepared for submission to MoEFCC & SPCB and other statutory authorities.

.....

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) Baseriya Managers Office (A9): Industrial Area

The location of the sampling station is 23° 47'17" N & 86° 22'12" E. The sampler was placed at Ground level of Safety Office. The station was selected to represent the impact of mining activities of Kusunda area, poor roads condition, heavy public traffic, burning of coal by the surrounding habitants.

II. BUFFER ZONE Monitoring Location

i) Nichitpur (A8) : Industrial Area

The location of the sampling station is 23° 48'20" N & 86° 21'30" E. The sampler was placed at roof top at Safety office of Nichitpur.

ii) Kusunda OCP (A10) : Industrial Area

The location of the sampling station is 23° 46.822' N & 86° 24.241' E. The sampler was placed at Ground level of Safety Office.

iii) Pootki Balihari Office (A16): Industrial Area

The location of the sampling station is 23°45'18" N & 86°21'46"E The sampler was placed at Ground level of Colliery Office.

2.2 Methodology of sampling and analysis

Parameters chosen for assessment of ambient air quality were Particulate Matter (PM₁₀), Particulate Matter (PM_{2.5}), Sulphur Di-oxide (SO₂) and Nitrogen Oxides (NO_x). Respirable Dust Samplers (RDS) & fine particulates for PM_{2.5} sampler were used for sampling of PM₁₀ & PM_{2.5} respectively at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analyzed in Environmental Laboratory of CMPDI, RI-I, Asansol.

Also in compliance of the EC conditions Half yearly analysis of Heavy metals has been carried out for Arsenic (As),Cadmium (Cd), Chromium (Cr),Mercury (Hg),Nickel (Ni),Lead (Pb).

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 PM₁₀

In **core zone** under **Industrial area** varies from 76 to 93 $\mu\text{g}/\text{m}^3$

In **buffer zone** in **Industrial area** varies from 66 to 94 $\mu\text{g}/\text{m}^3$

Particulate Matter PM_{2.5}

In **core zone** under **Industrial area** varies from 37 to 48 $\mu\text{g}/\text{m}^3$

In **buffer zone** in **Industrial area** varies from 31 to 48 $\mu\text{g}/\text{m}^3$

Sulphur Dioxide:

In **core zone** under **Industrial area** varies from <10.00 to 12 $\mu\text{g}/\text{m}^3$

In **buffer zone** in **Industrial area** varies from <10.00 to 13 $\mu\text{g}/\text{m}^3$

Oxides of Nitrogen:

In **core zone** under **Industrial area** varies from 18 to 27 $\mu\text{g}/\text{m}^3$

In **buffer zone** in **Industrial area** varies from 19 to 28 $\mu\text{g}/\text{m}^3$

AMBIENT AIR QUALITY DATA

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

Year : **2015-16.**

Name of the Cluster : **Cluster – VI**

Q.E.: **March 2016**

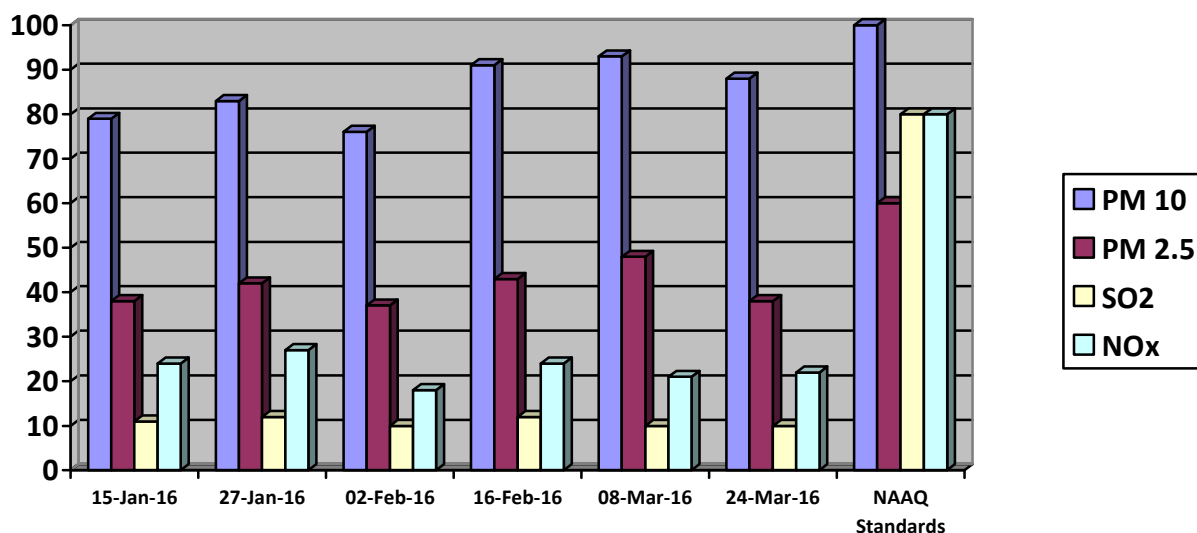
Station Code/Name: (a) A9 Baseriya Managers Office

Category:
Industrial

ZONE: Core

(a). Station Code/Name: A9 – Baseriya Managers Office Category: Industrial.¹

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO ₂	NO _x
1	15 - Jan -16	79	38	11	24
2	27 - Jan - 16	83	42	12	27
3	02 - Feb -16	76	37	<10.0	18
4	16 - Feb - 16	91	43	12	24
5	08 - Mar - 16	93	48	<10.0	21
6	24 - Mar - 16	88	38	<10.0	22
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(µg/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

AMBIENT AIR QUALITY DATA

Name of the Company: **Bharat Coking Coal limited**
 Name of the Cluster : **Cluster – VI**

Year : **2015-16.**
 Q.E.: **March 2016**

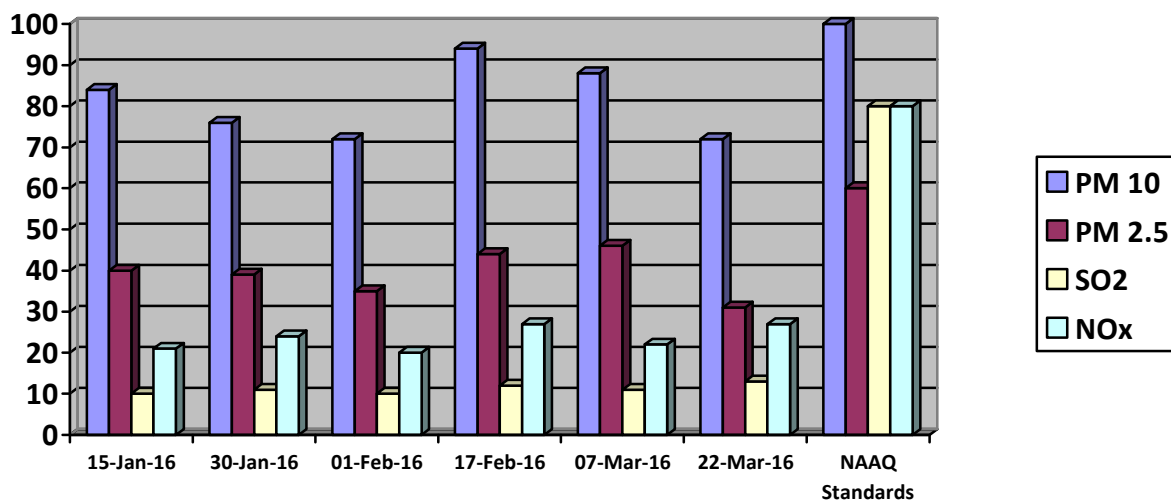
Station Code/Name: (a) **A8 Nichitpur**
 (b) **A10 Kusunda OCP**
 (c) **A16 Pootki Balihari Office**

Category:
Industrial.

ZONE: BUFFER

(a). **Station Code/Name: A8 – Nichitpur, Category: Industrial.²**

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO ₂	NO _x
1	15 - Jan -16	84	40	<10.0	21
2	30 - Jan - 16	76	39	11	24
3	01 - Feb -16	72	35	<10.0	20
4	17 - Feb - 16	94	44	12	27
5	07 - Mar - 16	88	46	11	22
6	22 - Mar - 16	72	31	13	27
	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(µg/m ³)	<0.005	<0.001	<0.01	<0.001	<0.01	<0.005

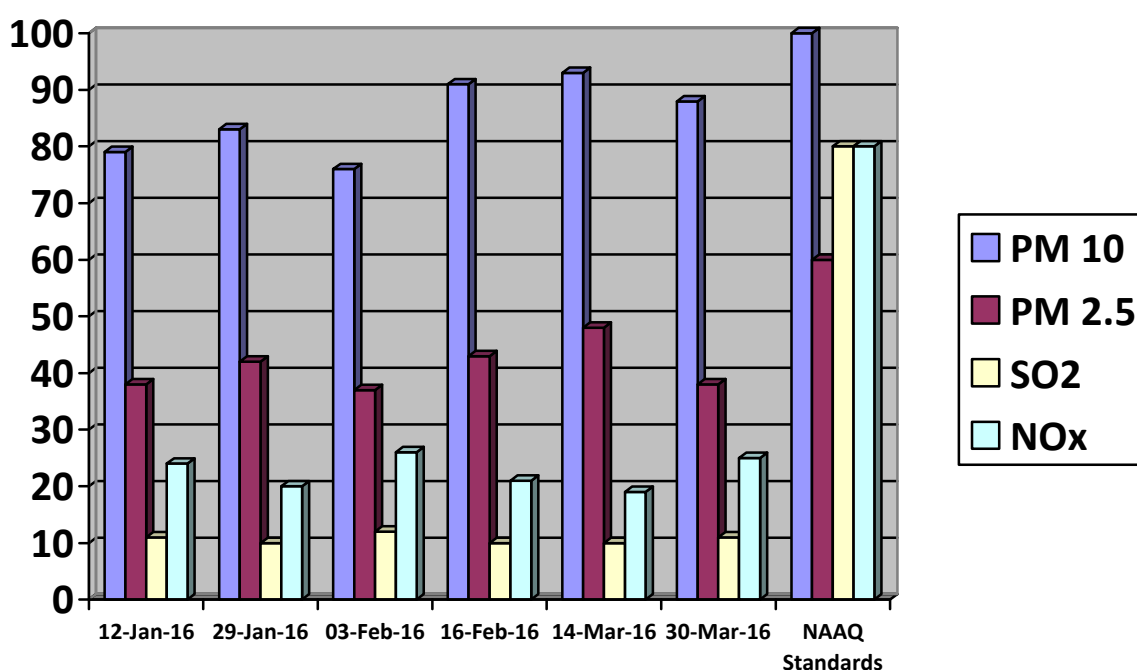
Note:

➤ 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

(b). Station Code/Name: A10 – Kusunda OCP, Category: Industrial.³


Sl. No.	Dates of sampling	PM 10	PM 2.5	SO ₂	NO _x
1	12 - Jan -16	79	38	11	24
2	29 - Jan - 16	83	42	<10.0	20
3	03 - Feb -16	76	37	12	26
4	16 - Feb - 16	91	43	<10.0	21
5	14 - Mar - 16	93	48	<10.0	19
6	30 - Mar - 16	88	38	11	25
	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(µg/m ³)	<0.005	<0.001	<0.01	<0.001	<0.01	<0.005

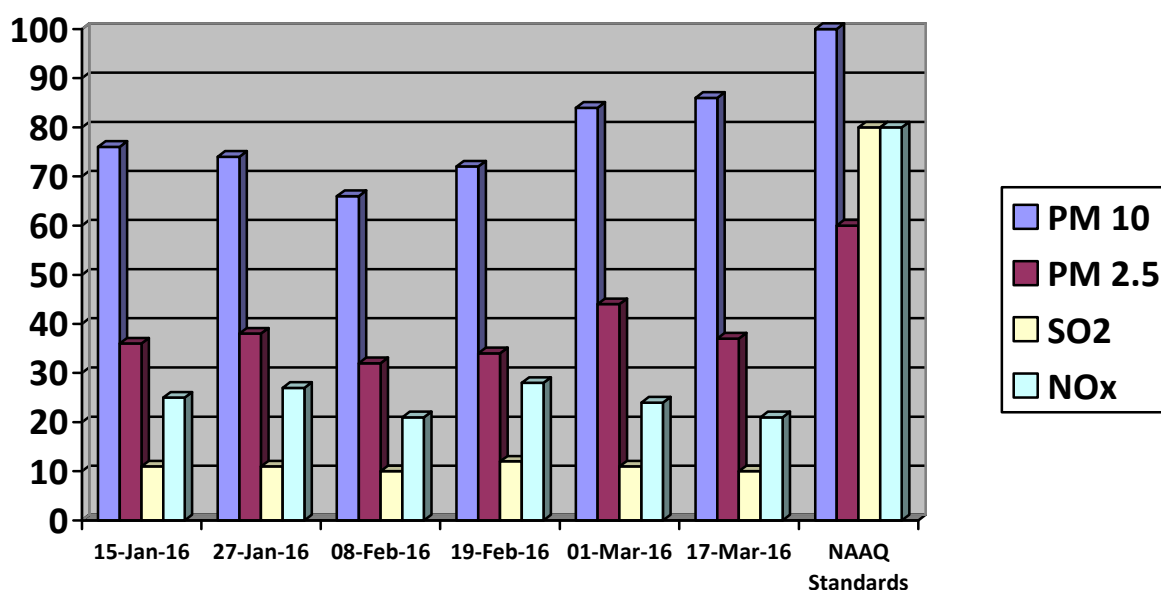
Note:

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

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

(c). Station Code/Name: A16 – Pootki Balihari Office, Category: Industrial.⁴

Sl. No.	Dates of sampling	PM 10	PM 2.5	SO ₂	NO _x
1	15 - Jan -16	76	36	11	25
2	27 - Jan - 16	74	38	11	27
3	08 - Feb -16	66	32	<10.0	21
4	19 - Feb - 16	72	34	12	28
5	01 - Mar - 16	84	44	11	24
6	17 - Mar - 16	86	37	<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(µg/m ³)	<0.005	<0.001	<0.01	<0.001	<0.01	<0.005

Note:

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


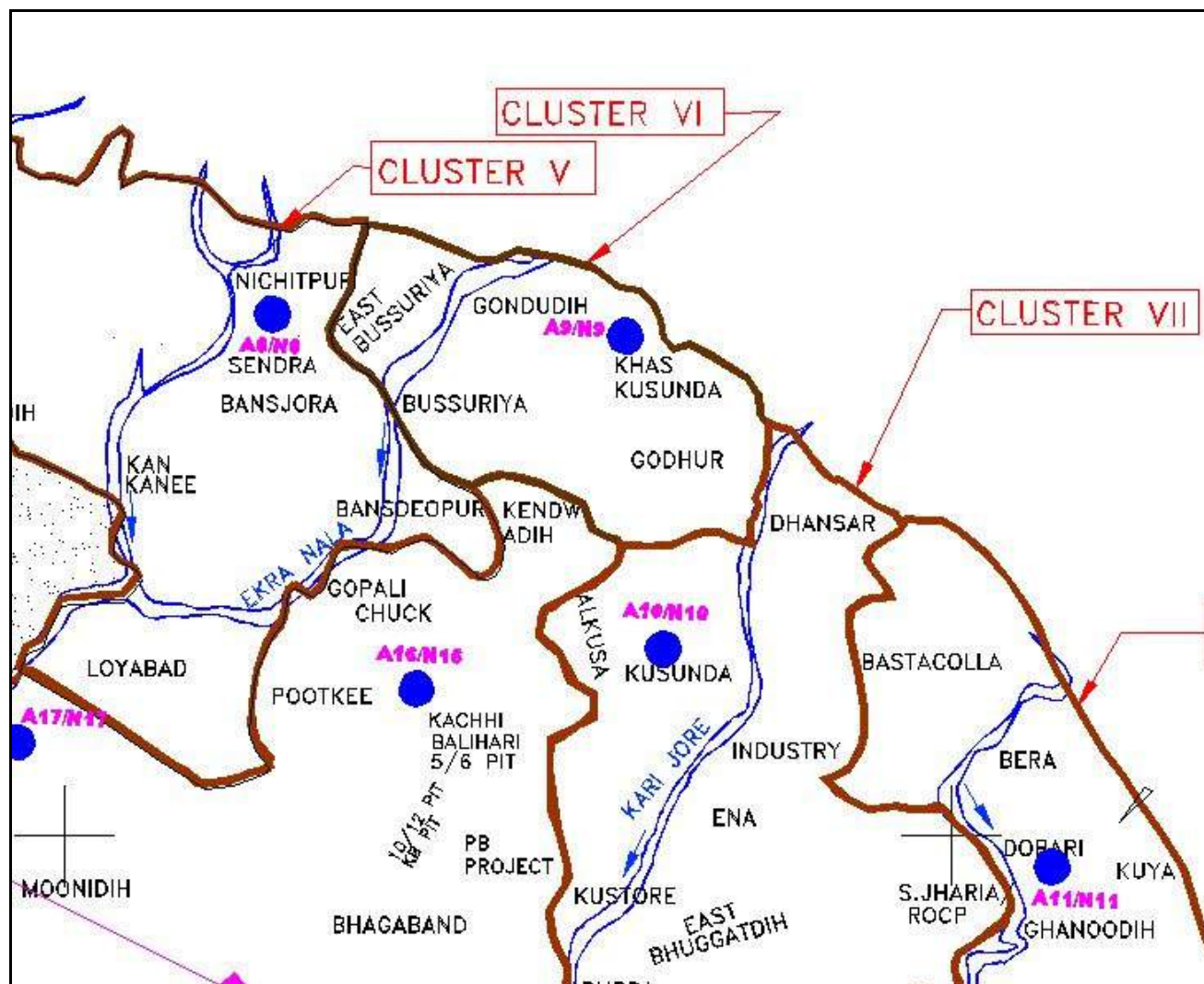
⁴ Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed..........Dated 28.05.2016. Job No. 110310

Fig I: Ambient Air Monitoring Stations in Cluster- VI in Core & Buffer Zones



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 <ul style="list-style-type: none"> • 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 m ³ /minute)
	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.Improved west 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 clause 2.

** 24 hourly / 8 hourly values shall be met 92% of the time in a year. However, 8% of the time it may exceed but not on two consecutive days.

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No. 14 of 1981), and in supersession of the notification No(s).S.O.384(E), dated 11th April 1994 and S.O.935(E), dated 14th October 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect

Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO₂), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogen dioxide (NO₂), µg/m³	Annual * 24 Hours **	40 80	30 80	-Jacob & Hochheiser modified (NaOH-NaAsO ₂) Method -Gas Phase Chemiluminescence
Particulate Matter (Size less than 10µm) or PM₁₀, µg/m³	Annual * 24 Hours **	60 100	60 100	-Gravimetric -TEOM -Beta attenuation
Particulate Matter (Size less than 2.5µm) or PM_{2.5}, µg/m³	Annual * 24 Hours **	40 60	40 60	-Gravimetric -TEOM -Beta attenuation
Ozone (O₃), µg/m³	8 Hours * 1 Hour **	100 180	100 180	-UV Photometric -Chemiluminescence -Chemical Method
Lead (Pb), µg/m³	Annual * 24 Hours **	0.50 1.0	0.50 1.0	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
Carbon Monoxide (CO), mg/m³	8 Hours ** 1 Hour **	02 04	02 04	-Non dispersive Infrared (NDIR) Spectroscopy
Ammonia (NH₃), µg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C₆H₆), µg/m³	Annual *	05	05	-Gas Chromatography (GC) based continuous analyzer -Adsorption and desorption followed by GC analysis
Benzo(a)Pyrene (BaP) Particulate phase only, ng/m³	Annual *	01	01	-Solvent extraction followed by HPLC/GC analysis
Arsenic (As), ng/m³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

NOTE: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigations.

CHAPTER – III

WATER QUALITY MONITORING

3.1 Location of sampling sites

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

i) **Mine Discharge of East Basseriya (MW6)**

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

ii) Drinking Water Quality at **Bansjora Borewell (DW6)**

iii) Surface Water Quality at **U/S of Ekra Nala (SW14)**

iv) Surface Water Quality at **D/S of Ekra Nala (SW15)**

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 analyzed for 25 & 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 parameters are within the permissible limits.

WATER QUALITY DATA

(Effluent Water)

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

Name of the Cluster: **Cluster - VI**

Month: **January, 2016.**

Name of the Stations & Code :

1. MW6- Mine Discharge of East Basseriya

First Fortnight

Sl. No.	Parameters	MW6 (Mine Discharge)	As per MOEF General Standards for schedule VI
		08.01.2016	
1	Total Suspended Solids	28	100 (Max)
2	pH	7.41	5.5 - 9.0
3	Oil & Grease	<2.0	10 (Max)
4	COD	20	250 (Max)

Second Fortnight

Sl. No.	Parameters	MW6 (Mine Discharge)	As per MOEF General Standards for schedule VI
		16.01.2016	
1	Total Suspended Solids	32	100 (Max)
2	pH	7.62	5.5 - 9.0
3	Oil & Grease	<2.0	10 (Max)
4	COD	20	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)

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

Name of the Cluster : **Cluster - VI**

Month: **February, 2016.**

Name of the Stations & Code :

1. MW6- Mine Discharge of East Basseriya

First Fortnight

Sl. No.	Parameters	MW6 (Mine Discharge)	As per MOEF General Standards for schedule VI
		03.02.2016	
1	Total Suspended Solids	42	100 (Max)
2	pH	7.15	5.5 - 9.0
3	Oil & Grease	<2.0	10 (Max)
4	COD	28	250 (Max)

Second Fortnight

Sl. No.	Parameters	MW6 (Mine Discharge)	As per MOEF General Standards for schedule VI
		17.02.2016	
1	Total Suspended Solids	46	100 (Max)
2	pH	7.22	5.5 - 9.0
3	Oil & Grease	<2.0	10 (Max)
4	COD	28	250 (Max)

All values are expressed in mg/lit unless specified.


Analysed By


18/5/16
Dy. Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

WATER QUALITY DATA

(Effluent Water)

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

Name of the Cluster : **Cluster - VI**

Month: **March, 2016.**

Name of the Stations & Code :

1. MW6- Mine Discharge of East Basseriya

First Fortnight

Sl. No.	Parameters	MW6 (Mine Discharge)	As per MOEF General Standards for schedule VI
		08.03.2016	
1	Total Suspended Solids	36	100 (Max)
2	pH	7.47	5.5 - 9.0
3	Oil & Grease	<2.0	10 (Max)
4	COD	20	250 (Max)

Second Fortnight

Sl. No.	Parameters	MW6 (Mine Discharge)	As per MOEF General Standards for schedule VI
		17.03.2016	
1	Total Suspended Solids	28	100 (Max)
2	pH	8.07	5.5 - 9.0
3	Oil & Grease	<2.0	10 (Max)
4	COD	24	250 (Max)

All values are expressed in mg/lit unless specified.


Analysed By


18/5/16
Dy. Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

WATER QUALITY

(EFFLUENT WATER- ALL PARAMETERS)

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

Coal Limited

Name of the Cluster : **Cluster - VI**

Period: **H. Y. Ending March, 2016.**

Area : **Kusunda**

**Project: East
Basseriya UGP**

Cluster VI

Stations:

1. Mine Water Discharge East Basseriya UGP MW-6

Date of Sampling:
17/03/2016

Sl.No.	Parameter	Sampling Stations			Detection Limit	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		MW-6	2	3			
1	Ammonical Nitrogen, mg/l, Max	0.54			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	24			4.00	250.0	APHA, 22 nd 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	<0.30			0.30	5.0	APHA, 22 nd Edition Molybdovanadate
8	Fluoride (as F) mg/l, Max	0.82			0.02	2.0	APHA, 22 nd Edition, SPADNS
9	Free Ammonia, mg/l, Max	<0.01			0.01	5.0	IS:3025/34:1988, Nessler's
10	Hexavalent Chromium, mg/l, Max	<0.01			0.01	0.1	APHA, 22 nd 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, 22 nd 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	1.4			0.50	10.0	APHA, 22 nd Edition, UV-Spectrophotometric
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	8.07			2.5	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
19	Phenolic compounds (as C ₆ H ₅ OH),mg/l, Max	<0.002			0.002	1.0	APHA, 22 nd Edition 4-Amino Antipyrine
20	Selenium (as Se), mg/l, Max	<0.002			0.002	0.05	APHA, 22 nd Edition, AAS-GTA
21	Sulphide (as SO ₃), mg/l, Max	<0.005			0.005	2.0	APHA, 22 nd Edition Methylene Blue
22	Temperature (°C)	36.3			Shall not exceed 5° C above the receiving temp.		IS-3025/09:1984, Thermometric
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	2.8			1.00	100.0	IS:3025/34:1988, Nessler's
25	Total Residual Chlorine, mg/l, Max	0.03			0.02	1.0	APHA, 22 nd Edition, DPD
26	Total Suspended Solids, mg/l, Max	28			10.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
27	Zinc (as Zn), mg/l, Max	0.221			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 Cluster : **Cluster - VI** Period: **Q. E. March, 2016.**

Area : **Kusunda**

Project: East
Basseriya UGP

Cluster VI

Stations:

1. Upstream in Ekra Nala SW-14
2. Downstream in Ekra Nala SW-15

Date of Sampling:
08/03/2016
08/03/2016

Sl. No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		SW-14	SW-15	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	2.8	3.00			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	40	68			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.	5.5	4.3			0.10	IS 3025/38:1989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	0.81	1.3			0.02	APHA, 22 nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	<0.01	<0.01			0.01	APHA, 22 nd 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, 22 nd Edition AAS-GTA
11	Nitrate (as NO ₃), mg/l, Max	17.28	19.05			0.50	APHA, 22 nd Edition, UV-Spectrophotometric
12	pH value	7.72	7.53			2.5	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.002	<0.002			0.002	APHA, 22 nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002			0.002	APHA, 22 nd Edition AAS-GTA
15	Sulphate (as SO ₄) mg/l, Max	240	290			2.00	APHA, 22 nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	504	582			25.00	IS 3025 /16:1984 R : 2006, Gravimetric
17	Zinc (as Zn), mg/l, Max	0.012	0.011			0.01	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

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

WATER QUALITY

(DRINKING WATER- ALL PARAMETERS)

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

Name of the Cluster : **Cluster - VI**

Period: **Q. E. March, 2016.**

Area : **Kusunda**

Project: East
Basseriya UGP

Cluster VI

Stations:

1. Drinking Water from Bansjora borewell DW-6

Date of Sampling:
08/03/2016

Sl.No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		DW-6	2	3			
1	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA, 22 nd Edition, Carmine
2	Colour, in Hazen Units	5			1	5	APHA, 22 nd Edition, Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	189			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	112			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	0.47			0.02	1.0	APHA, 22 nd Edition, SPADNS
7	Free Residual Chlorine, mg/l, Min	0.04			0.02	0.2	APHA, 22 nd 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, 22 nd 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	19			0.5	45	APHA, 22 nd Edition, UV-Spectrophotometric
12	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	8.27			2.5	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric
14	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001			0.001	0.001	APHA, 22 nd Edition, 4-Amino Antipyrine
15	Selenium (as Se), mg/l, Max	<0.002			0.002	0.01	APHA, 22 nd Edition, AAS-GTA
16	Taste	Acceptable			Qualitative	Acceptable	APHA, 22 nd Edition. Taste
17	Sulphate (as SO ₄) mg/l, Max	176			2.00	200	APHA, 22 nd Edition. Turbidity
18	Total Alkalinity (CaCO ₃), mg/l, Max	280			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	1092			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (CaCO ₃), mg/l, Max	756			4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	5			1.0	1	IS-3025/10:1984 R-1996, Nephelometric
24	Zinc (as Zn), mg/l, Max	0.03			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

(GROUND WATER- ALL PARAMETERS)

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

Name of the Cluster : **Cluster - VI**

Period: **Q. E. March, 2016.**

Area :

Kusunda

**Project: East
Basseriya UGP**

Cluster VI

Stations:

1. Ground Water from Godhur More GW-6

Date of Sampling:
28/02/2016

Sl.No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		GW-6	2	3			
1	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA, 22 nd Edition, Carmine
2	Colour, in Hazen Units	5			1	5	APHA, 22 nd Edition, Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	99			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	94			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	1.14			0.02	1.0	APHA, 22 nd Edition, SPADNS
7	Free Residual Chlorine, mg/l, Min	0.04			0.02	0.2	APHA, 22 nd 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, 22 nd 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	3			0.5	45	APHA, 22 nd Edition, UV-Spectrophotometric
12	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	8.02			0.20	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric
14	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max	<0.001			0.001	0.001	APHA, 22 nd Edition, 4-Amino Antipyrine
15	Selenium (as Se), mg/l, Max	<0.002			0.002	0.01	APHA, 22 nd Edition, AAS-GTA
16	Taste	Acceptable			Qualitative	Acceptable	APHA, 22 nd Edition. Taste
17	Sulphate (as SO ₄) mg/l, Max	142			2.00	200	APHA, 22 nd Edition. Turbidity
18	Total Alkalinity (CaCO ₃), mg/l, Max	364			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	890			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (CaCO ₃), mg/l, Max	528			4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	7			1.0	1	IS-3025/10:1984 R-1996, Nephelometric
24	Zinc (as Zn), mg/l, Max	0.017			0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

Analysed By

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

CHAPTER - IV

NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites and their rationale

i) **Baseriya Managers Office (N9)**

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) **Nichitpur (N8)**

To assess the noise generated in the mines activity. Noise levels were recorded in the mines area

iii) **Kusunda OCP (N10)**

To assess the noise level in the industrial area,

iv) **Pootki Balihari Office (N16)**

To assess the noise level in the industrial area, noise levels were recorded during day time in the Mines area.

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** Year : **2015-16.**

Coal Limited

Name of the Cluster: **Cluster -VI**

Month: **January, 2016.**

Name of the Stations & Code :

1. **Baseriya Managers Office (N9)**
2. **Nichitpur (N8)**
3. **Kusunda OCP (N10)**
4. **Pootki Balihari Office (N16)¹**

(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	Baseriya Manegers Office (N9)	Industrial area	15.01.2016	61.4	75
2	Nichitpur (N8)	Industrial area	15.01.2016	62.5	75
3	Kusunda OCP (N10)	Industrial area	12.01.2016	63.8	75
4	Pootki Balihari office (N16)	Industrial area	15.01.2016	61.8	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	Baseriya Manegers Office (N9)	Industrial area	27.01.2016	57.3	75
2	Nichitpur (N8)	Industrial area	30.01.2016	61.3	75
3	Kusunda OCP (N10)	Industrial area	29.01.2016	62.6	75
4	Pootki Balihari office (N16)	Industrial area	27.01.2016	53.4	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..........Dated 28.05.2016. Job No. 110310

NOISE LEVEL DATA

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

Coal Limited

Name of the Cluster : **Cluster -VI**

Month: **February, 2016.**

Name of the Stations & Code :

1. **Baseriya Managers Office (N9)**
2. **Nichitpur (N8)**
3. **Kusunda OCP (N10)**
4. **Pootki Balihari Office (N16)²**

a. First Fortnight


Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	<i>*Permissible Limit of Noise level in dB(A)</i>
1	Baseriya Managers Office (N9)	Industrial area	02.02.2016	63.8	75
2	Nichitpur (N8)	Industrial area	01.02.2016	64.6	75
3	Kusunda OCP (N10)	Industrial area	03.02.2016	61.3	75
4	Pootki Balihari office (N16)	Industrial area	08.02.2016	63.2	75

b. Second Fortnight

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	<i>*Permissible Limit of Noise level in dB(A)</i>
1	Baseriya Managers Office (N9)	Industrial area	16.02.2016	57.6	75
2	Nichitpur (N8)	Industrial area	17.02.2016	61.3	75
3	Kusunda OCP (N10)	Industrial area	16.02.2016	58.7	75
4	Pootki Balihari office (N16)	Industrial area	19.02.2016	66.8	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 Cluster : **Cluster -VI**

Month: **March, 2016.**

Name of the Stations & Code :

1. **Baseriya Managers Office (N9)**
2. **Nichitpur (N8)**
3. **Kusunda OCP (N10)**
4. **Pootki Balihari Office (N16)³**

a. First Fortnight data

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	*Permissible Limit of Noise level in dB(A)
1	Baseriya Managers Office (N9)	Industrial area	08.03.2016	60.3	75
2	Nichitpur (N8)	Industrial area	07.03.2016	58.7	75
3	Kusunda OCP (N10)	Industrial area	14.03.2016	55.6	75
4	Pootki Balihari office (N16)	Industrial area	01.03.2016	53.5	75

b. Second Fortnight data

Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	*Permissible Limit of Noise level in dB(A)
1	Baseriya Managers Office (N9)	Industrial area	24.03.2016	62.7	75
2	Nichitpur (N8)	Industrial area	22.03.2016	61.6	75
3	Kusunda OCP (N10)	Industrial area	30.03.2016	64.8	75
4	Pootki Balihari office (N16)	Industrial area	17.03.2016	61.7	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.*


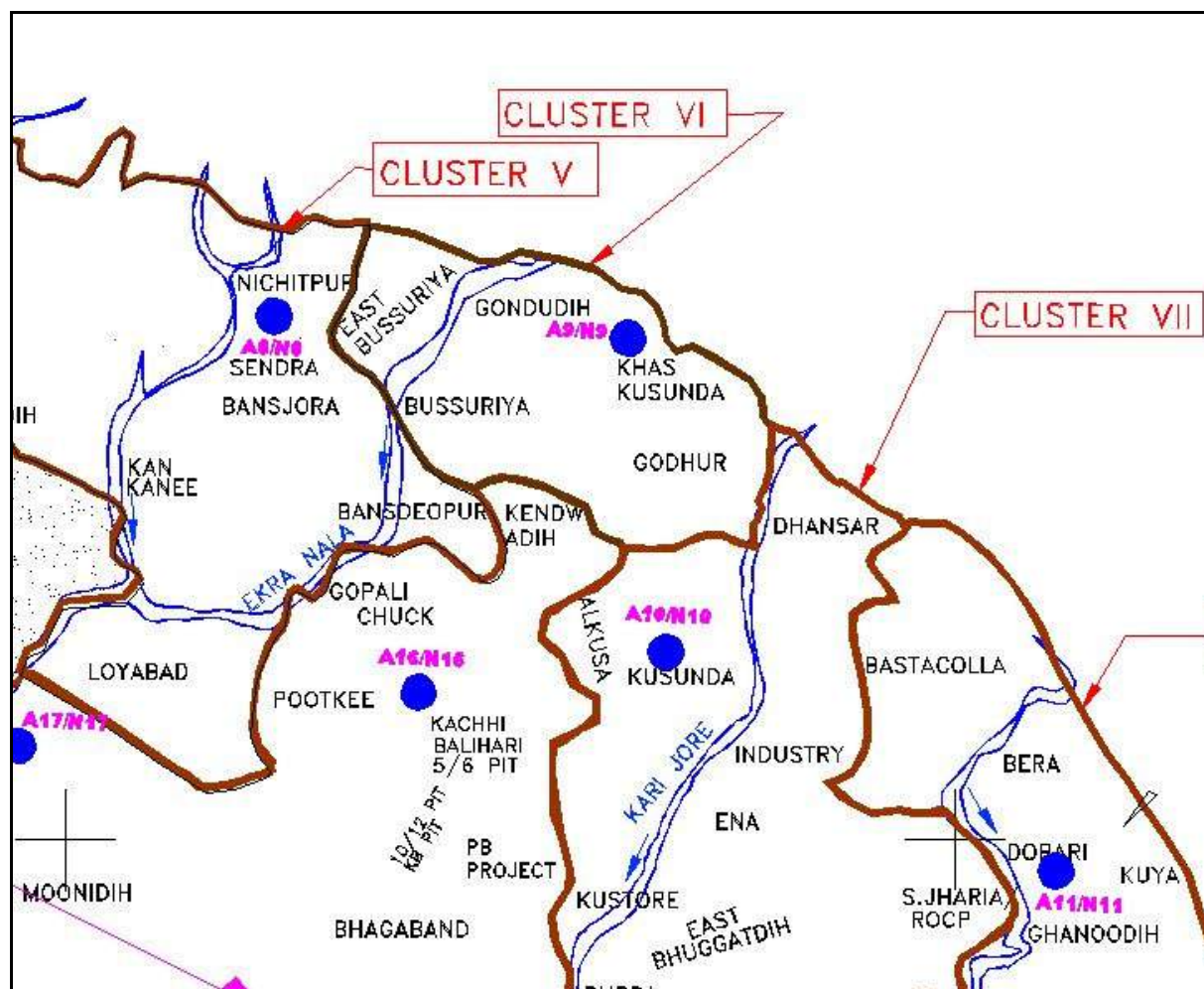
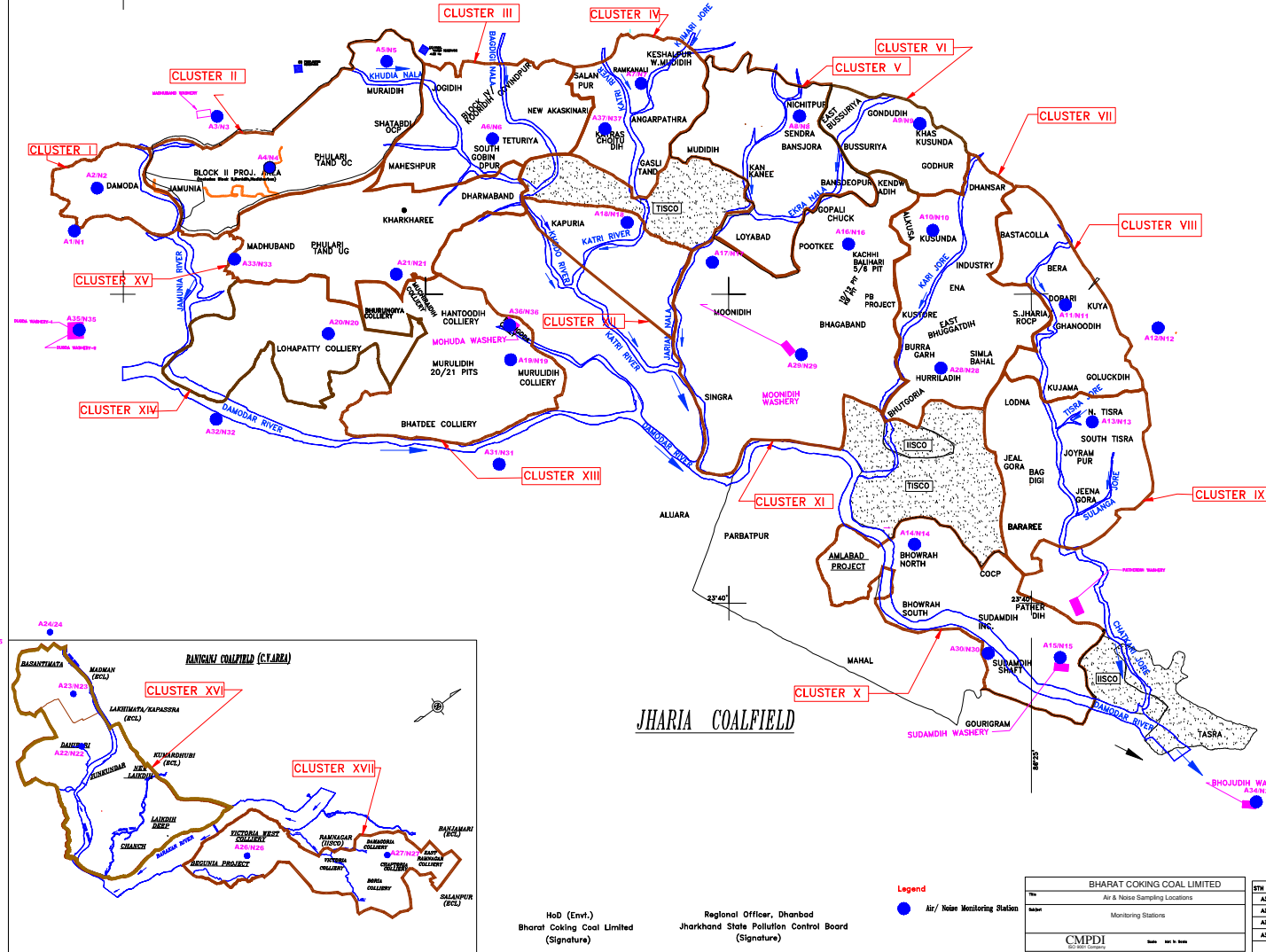
³ Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed..........Dated 28.05.2016. Job No. 110310

Fig: Noise Level Monitoring Location of Cluster VI



Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL

INDEX

Cluster	Surface Water (U/S, D/S)	Name of River/ Nala/ Jore	Mine Effluent Water	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Jamunia River	MW1	Damoda Area	GW1	Ghulway Village
II	SW3, SW4	Khudla Nala	MW2	Block II OCP	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Khudla Nala, Bagdigi Nala	MW3	Govindpur Colliery	GW3	Jogdih Village
IV	SW8, SW11, SW9, SW10	Kain River, Kurnai Jore	MW4	Chotudih	GW4	Kankane Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudidih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Basauria UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kari Jore	MW7	Dhanbari UGP	GW7	Humidih
VIII	SW18, SW19	Kashi Jore	MW8	Dobari UGP	GW8	Ghanudih
IX	SW19, SW20	Kashi Jore	MW9	Jeenagora	GW9	Lodha
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband I UGP	GW11	Bhagabandh
XII	SW27, SW28	Kain River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Muridih (20/21)	GW13	Muridih
XIV	SW31, SW32	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Khudla Nala	MW15	Khanhane UGP	GW15	Khanhane
XVI	SW33, SW34	Khudla River	MW16	Dahbari OCP	GW16	Pattabari Village
XVII	SW35, SW36	Barakar River	MW17	Damagora Colliery	GW17	Chaptoria

