ENVIRONMENTAL CLEARANCE COMPLIANCE OF CLUSTER-XIV (GRANTED VIDE LETTER NO.J-11015/10/2010-IA.II (M) DATED 06.06.2013

(APRIL'18 – SEPT'18)

Sl. No.	A. Specific Conditions by MOEF:	Compliance
i.	**No mining shall be undertaken in/under the forestland until prior forestry clearance has been obtained under the provisions of FC Act 1980.**	Application for forest clearance was applied on 16.3.2010 to DFO, Dhanbad vide ref. no. WJA/MND/F/10/13 dated 16.3.2010. The initial application was misplaced from the office of DFO Dhanbad. It was further directed to apply again demanding "Jungle- Jhari" report for the whole leasehold area. We applied to get the above report from concerned Circle Officer. After several correspondences, C.O. sent the "Jungle- Jhari report for 3 mouzas out of 14 mauza only, showing unavailability/ tearing off of Khatiyan. After putting up the above report to DFO, Dhanbad, he directed to get the above report for rest of Mouzas from D.C's Office, Dhanbad. D.C's office issued the same for 2 mauzas only showing unavailability/tearing off of Khatiyan. Hence, application for forest clearance was again applied to DFO, Dhanbad vide ref. no. WJA/MND/GM/2013/2529 dt. 22.4.13/28.5.13 including above report. There are two no. of Mouzas namely Kunji and Lohapatti which have forest land under leasehold area of Lohapatti colliery. NOC from above Mouzas are obtained from the village panchayats as per the advice of the DFO. DFO, Dhanbad directed us to apply forest clearance of the same through ON-LINE. So Online registration for the same was done vide Unique Proposal no. FP/JH/MIN/9728/2015.Form 'A' application for the same has been completed, top sheets uploaded and Geo-reference is being done. Correspondences for NPV payment are done with concerned DFO, Dhanbad.
ii.	**The maximum production in the cluster shall not exceed beyond that for which environmental clearance has been granted for the cluster XIV.**	It is being complied. Annexure - I
iii.	**The measure identified in the environmental plan for cluster–XIV group of mine and the condition given in this environmental clearance letter shall be dovetailed to the implementation of Jharia**	Implementation of Jharia Action Plan is under process.

	Action Plan.	
Iv.	**As there is no fire in cluster XIV but the measure should be adopted proponent to control spread of neighboring fire to this cluster XIV. The proponent shall prepare time series maps of Jharia Coal field through NRSA to monitor & prevent fire problems in this Jharia Coalfield by Isothermal mapping / imaging and monitoring temperatures of the coal seam (whether they are closed 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 fire in other areas including in mines of cluster - XIV shall be undertaken.**	Work Order Issued to National Remote Sensing Center, ISRO for "Delineation of Surface Coal Fire and associated Land Subsidence in Jharia Coalfield, Jharkhand using satellite based remote – sensing techniques". Annexure - II
V.	**Underground mining should be taken up after completion of reclamation of O/C mine area after two years.**	Agreed. Lohapatti O/C project yet not started.
vi.	**No mining shall be undertaken where underground fires continue. Measure shall be taken to prevent/check such fire including in old OB dump.**	At present there is no fire.
vii.	**A part of Cluster XIV is under River Damodar. It was clarified that although the mine is underground, there is no coal underneath River Damodar, which would be mined. The Committee desired that the data of bore wells near River Damodar require to be monitored for permeability and seepage of water of River Damodar.**	Agreed. There is no coal mining underneath of River Damodar.
viii.	**The rejects of washeries in Cluster –XIV should be send to FBC based plant.**	There is no washery in cluster XIV, so rejects of washery in cluster XIV cannot be sent to FBC based plant.
ix	**There shall be no external OB dumps.OB produce from the whole cluster will be 7.29 Mm^3. OB from one patch OCP mine shall be backfilled. At the end of the mining there shall be no void and the entire mined out area shall be re-vegetated. Areas where opencast mining was carried out and completed shall be reclaimed immediately thereafter.**	Will be complied. There is no opencast mine in this cluster at present.
x.	**A detailed calendar plan of production with plan for OB dumping and back filling (for open cast mines) and reclamation and**	

	final mine closure plan for each mine of cluster XIV shall be drawn up & implemented.	Being implemented. Mine closure plan is approved.
xi.	**The void in 5 ha area shall be converted in to a water reservoir of maximum depth of 15-20 mtr in post mining stage and shall be gently sloped and upper benches of the reservoir shall be stabilized with plantation and periphery of the reservoir fenced . The abandoned pits and voids should be backfilled with OB & biologically reclaimed with plantation and or may used for pisciculture.**	Will be Complied. As there is no opencast mine in this cluster at present.
xii.	**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.**	Being Complied. There is no running opencast mine in this cluster at present.
xiii.	**Active OB dumps near water body and rivers should be rehandled for back filling abandoned mine voids. However, those which have been biologically reclaimed need not be disturbed.**	No active OB dumps in this cluster at present.
xiv.	**Thick green belt shall be developed along undisturbed areas, mine boundary and in mine reclamation. During post mining stage, a total of 47.63 ha would be reclaimed and afforested by planting native species in consultation with local DFO/Agriculture deptt. Institutions with the relevant discipline. The density of the trees should be around 2500 plants per ha.**	Agreed. Sufficient plantation in required area is done and is also being done. There is no reclaimed land under the leasehold area of cluster XIV and so thick green belt is already developed in adjoining area of cluster XIII (Ecological restoration of 4.2 ha, 1.5 ha 1.8 ha & 0.9 ha area are maintained for the purpose in reclaimed land by planting native species – FRI, Dehradun is doing monitoring of 4.2 ha eco-restoration site).
xv.	**The roads should be provided with avenue plantation on both sides as trees act as sink of carbon and other pollutant.**	Agreed. Being complied.
xvi.	**Specific mitigative measures identified for the Jharia Coalfields in the Environmental Action Plan prepared for Dhanbad as a critically polluted are and relevant for Cluster- XIV shall be implemented.**	Implemented. Environmental action plan is maintained for the purpose.

xvii.	**The locations of monitoring stations in the Jharia Coalfields should be finalized in consultation with the Jharkhand State Pollution Control Board. The Committee stated that smoke/dust emission vary from source to source (fuel wood, coal, flyash 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.**	Location of monitoring stations was already finalized. Source Apportionment Study:- Tender for conducting source apportionment study for BCCL was floated twice, however, none of the bidders qualified. Therefore, as per the MoU "Sustainable Coal Mining in Coal India Limited" entered between CIL and NEERI, NEERI Nagpur was approached for conducting Source Apportionment Study BCCL for compliance of EC conditions. The proposal regarding Conducting the Source Apportionment Study has been submitted by NEERI. Presently it has been submitted to CIL for further scrutiny and approval.
xviii.	**No ground water shall be used for mining activities. Additional water required, if any, shall be met from mine water or by recycling / reused of the water from the existing activities and from rain water harvesting measures. The project authority shall meet water requirement of nearby village(s) in case the village wells go dry to dewatering of mine.**	Already being done water supplied to Kandra and Bhurungia village and all other adjoining villages. There are 8 no. of ponds maintained for the purpose within leasehold area of Cluster XIV.
xix.	**Regular monitoring of groundwater level and quality of the study area shall be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality including Arsenic and Fluoride during the month of May. Data thus collected shall be submitted to the Ministry of Environment & Forest and to the Central Pollution Control Board/SPCB quarterly within one month of monitoring. Rainwater harvesting measures shall be undertaken in case monitoring of water table indicates a declining trend.**	It is being complied. CMPDI RI-II has prepared a report for Location and design of Piezometers. Ground water monitoring has been done.

xx.	**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. Monitoring work being done by CMPDI. Records maintained for the purpose.
xxi.	**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.**	There is no effluent discharge into natural water course. However there is arrangement for treatment of effluent discharge to prescribed standards. There is neither Open Cast mine running nor CHP nor such workshop in this cluster at present.
xxii.	**Regular monitoring of subsidence movement on the surface over and around the working area and impact natural drainage pattern, water bodies, vegetation, structure, roads and surroundings shall be continued till movement ceases completely. In case observation of any high rate of subsidence movement, appropriate effective corrective measure shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil /suitable material.**	At present there is no active depillaring operation in the underground workings of ClusterXIV. There is no chance of active subsidence at present. However subsidence monitoring is being done.
xxiii.	**Sufficient coal pillars shall be left un extracted around the air shaft (within subsidence influence area) to protect from any damage from subsidence, if any.**	Already complied as per DGMS provisions.
xxiv.	**High root density tree species shall be selected and planted over areas likely to be affected by subsidence.**	Plantation in required area is done and is also being done. There is no chance of active subsidence at present.
Xxv.	**Depression due to subsidence resulting in water accumulating within low lying areas shall be filled up or drained out by cutting drains.**	At present there is no active depillaring operation in the underground workings of Cluster XIV. There is no chance of active subsidence at present. However subsidence monitoring is being done.
Xxvi.	**Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the road.**	Already complied as per DGMS's statutory provisions.
xxvii.	**No depillaring operation shall be carried out below the township/colony.**	At present there is no active depillaring operation in the underground workings of Cluster XIV. There is no chance of active subsidence at present.
xxviii.	**The transportation plan for conveyor – cum – rail for cluster XIV should be dovetailed with Jharia Action Plan. Road transportation of coal during phase I should be by mechanically covered trucks,**	Presently no Coal Transportation from cluster-XIV mines as there is NIL Production.

	which should be introduced at the earliest. The plan for conveyor – cum – rail for cluster XIV should be dovetailed with Jharia Action Plan. The road transportation of coal during phase I should be by mechanically covered trucks.	
xxix.	**A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport.**	Pollution load study report for has been submitted by CMPDI. Annexure- III
xxx.	**R & R of 713 nos. of PAF's involved. They should be rehabilitated at cost of Rs. 5035.38 lacs as per the approved Jharia Action Plan.**	PAF's involved is being rehabilitated as per cost specified as per Jharia Action Plan.

Xxxi.	**Details of transportation, CSR, R&R and implementation of environmental action plan for each of the 17 clusters should be brought out in a booklet for and submitted to Ministry.**	Will be Complied.
Xxxii.	**A detailed CSR action plan shall be prepared for cluster XIV group of mines. Specific activities shall be identified for CSR of Rs. 20.25 / annum @of Rs.5/ton of coal production as recurring expenditure. The area within the cluster XIV ML that would be existing waste land and not being acquired shall be put to productive use under CSR and developed with fruit bearing and other useful species for the local communities . Third party evaluation shall be got carried out regularly for the proper implementation of activities under taken in the project area under CSR. Issue raised in the public hearing should 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 the expenditure thereon shall be uploaded on the company website every year. The company must give priority to capacity building both within the company and to the local youth, who are motivated to carry out the work in future.**	Agreed. Being complied

xxxiii.	**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.**	Time series map of vegetation cover in the Jharia Coal field has been carried out through CMPDI in the year 2014 and 2017(which is enclosed as Annexure- IV)
xxxiv.	**A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests five year before mine closure for approval. Habitat Restoration Plan of the mine area shall be carried out using a mix of native species found in the original ecosystem, which were conserved in-situ and ex-situ in an identified area within the lease for reintroduction in the mine during mine reclamation and at the post mining stage for habitat restoration.**	Mine closure plan has already been approved.
xxxv.	**A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the head of Company for implementing environment policy and socio – economic issues and the capacity building required in this regard.**	A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives which includes Environment, Mining, Excavation has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, one executive in each area has also been nominated as Project Nodal Officer (Environment) and is also entrusted with the responsibility of compliance and observance of the environmental Acts/ Laws including environment protection measures .The activities are monitored on regular basis at Area and at Headquarters levels. GM (Environment) at head quarter level, co-ordinates with all the Areas and reports to the Director (Technical) and in turn he reports to the CMD of the company. The team is multidisciplinary and very much motivated under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is being done.

xxxvi.	**Implementation of final mine closure plan for cluster XIV, subject to obtaining prior approval of the DGMS in regard to mines safety issues.**	Mine closure plan has been approved. Will be implemented.
xxxvii.	**Corporate Environment Responsibility:**	Annexure- V
a)	**The Company shall have a well laid down Environment Policy approved by the Board of Directors.**	Agreed
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.**	Complied
d)	**To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.**	Complied
Sl. No.	**B. General Conditions Conditions by MOEF:**	**Compliance**
i.	**No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment**	Being Complied

	and Forests.	
ii.	**No change in the calendar plan of production for quantum of mineral coal shall be made.**	Being Complied
iii.	**Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM10, PM 2.5, SO_2 and NO_x monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.**	The locations of monitoring stations in the Jharia Coalfields has been finalized in consultation with the Jharkhand State Pollution Control Board. The work of monitoring of ambient environment is being done through CMPDIL which is having laboratory under EP rule. Records for the same are maintained. Annexure - VI
iv.	**Data on ambient air quality (PM10, PM 2.5, SO_2 and NO_x) 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.**	Being complied. Monitoring for the same is done by CMPDIL.
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 No opencast projects at present in Cluster XIV.
vi.	**Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.**	The work of monitoring of ambient environment done through CMPDIL which is having laboratory under EP rule. There is neither Open Cast mine running nor CHP nor such workshop from where effluent discharge is found. Very small quantity of burnt oil is generated which is used to lubricate the machines.
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.	Already Complied.
viii.	**Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board and data got analysed through a laboratory recognised under EPA Rules, 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.**	It is complied. Montoring for the same is being done by CMPDI which is having laboratory under EP rule. Annexure-VI
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. Vocational training Centers under separate Human Resource Development Deptt. is conducting regular training programme on these issues. Annexure - VII
x.	**Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing**.	Initial Medical Examination (IME) and Periodical Medical Examination (PME) of all the personnel are carried out as per the Statutes and Director General of Mines Safety (DGMS) `s guideline.
xi.	**A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.**	A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives which includes Environment, Mining & Excavation has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, One executive in each area has also been nominated as Project Nodal Officer (Environment) and is also entrusted with the responsibility of compliance and observance of the environmental Acts/ Laws including environment protection measures .The activities are monitored on regular basis at Area and at Head quarters levels. GM (Environment) at head quarter level,

		co-ordinates with all the Areas and reports to the Director (Technical) and in turn he reports to the CMD of the company. The team is multidisciplinary and very much motivated under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is being done.
xii.	**The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Bhubaneswar.**	It is being initiated to comply the same. Agreed to report the same.

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 http://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 be 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, SO 2 and NOx (ambient) and critical sectorial 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 of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the Ministry, respective Zonal Office s of CPCB and the SPCB.**	Being complied.
xviii.	**The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/monitoring reports.**	Agreed .It is being and shall be complied.
xix	**The Environmental statement for each financial year ending 31st March – Form – V is mandated to be submitted by the Project proponent for the concerned State Pollution Control Board as prescribed under the Environmental (Protection) Rules, 1986 as amended subsequently, shall also be uploaded on the company's website along with the status of compliances of EC conditions and shall be sent to the respective Regional Officers of the MOEF by e-mail.**	Already complied
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 withdrawal of this clearance and attract the provisions of the Environment**	Agreed

	(Protection) Act, 1986.	
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.**	Agreed
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

06.12.2018

Project officer, Lohapatti colliery

Project Officer
LOHAPATI COLLIERY

ANNEXURE- I

A. Production from April'18 to Sept'18 of Cluster XIV mines

Month		April '18	May'18	June'18	July'18	Aug'18	Sept'18	Total (tonne)
Cluster XIV	Lohapatti UG Mine	0	0	0	0	0	0	0
	Lohapatti OC Mine	Nil						Nil
							Total (in tonne)	0
	Production is closed from April'18 from Lohapatti UG Mine.							

ANNEXURE- II

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

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

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

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

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

Dear Sir,

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

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

Thanking you,

Yours faithfully,

7/4/17

General Manager I/C (S & R)

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

ANNEXURE - III

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)
गोन्डवाना प्लेस, कांके रोड, राँची - 834 031, झारखंड (भारत)
Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
Gondwana Place, Kanke Road, Ranchi - 834 031, Jharkhand (INDIA)
Corporate Identity Number (CIN): U14292JH1975GOI001223

पत्रांकः पर्यावरण /15/Lab-16 / E-48671 दिनांकः 31.03.2017

सेवा में,

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

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

महोदय,

Please find attached soft copies of the report on "Study to analyze the Extent of reduction of pollution load every year by reducing coal transportation by Road" for the following **4 (Four) clusters**:

Sl. No.	Name of the Cluster	Peak Production (MTY)
1.	Cluster -IV	3.706
2.	Cluster -XIII	0.234
3.	Cluster -XIV	0.526
4.	Cluster -XVI	1.963

The above reports have been prepared based on the data provided by BCCL and meeting held in the first week of November 2016 at BCCL (HQ) Dhanbad.
You are requested to provide the data for those clusters for which it has not been submitted yet.

सधन्यवाद,

संलग्नकः यथोक्त

भवदीय

31.3.17
महा-प्रबन्धक(पर्यावरण)

प्रतिलिपि:

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

फोन नम्बर / Phone No. : +91 651 2230483
फैक्स नम्बर / Fax No.: +91 651 2231447वेब साईट / Website
Address: www.cmpdi.co.in,Email-gmenv.cmpdi@coalindia.in

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

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

CLUSTER XIV GROUP OF MINES

(Lohapatti UG Mine & Lohapatti OC Mine)

Normative Production : 0405 MTPA
Peak Production : 0.526 MTPA
Lease Hold Area : 1577.22 Ha

Bharat Coking Coal Limited

(March, 2017)

Prepared by

Environment Division

Central Mine Planning & Design Institute Limited

CMPDI (HQ)

Gondwana Place

Kanke Road, Ranchi-834008

CONTENTS

Chapter – I

Introduction

1.1 Genesis:

MOEF provided Environmental Clearance to the various mines of the Cluster vide letter no. J- 11015/10/ 2010 -IA.II(M) dated 6 June 13.

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

1.2 Methodology:

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

1.3 General Information about the Cluster:

1.3.1 Brief Description:

Cluster-XIV consists of two mines namely, Loahapatti opencast (a proposed mine) and Lohapatti underground mine (an operating unit) in the Western Jharia Area of the Bharat Coking Coal Limited in the Dhanbad District of Jharkhand state. BCCL is the proponent of the cluster and it is under the administrative control of Coal India Limited. Coal India Limited is a Public Sector Undertaking of Government of India and functioning under the Ministry of Coal, Govt. of India.

BCCL is the proponent of the cluster and it is under the administrative control of Coal India Limited.

1.3.2 Nature and Size of the Cluster:

Cluster-XIV consists of two mines namely, Loahapatti opencast (a proposed mine) and Lohapatti underground mine (an operating unit) in the Western Jharia Area of the Bharat Coking Coal Limited in the Dhanbad District of Jharkhand state.

The details of the mines showing normative/ peak productions, lease hold areas and life are given in Table no. 1.1.

Table 1.1: Details of the Mines of Cluster –XIV

Sl .No.	Name of Mine	Production Capacity (MTY)		Lease Hold Area (Ha)
		Normative	Peak	
1	Lohapatti UG Mine	0.03	0.039	1577.22
2	Lohapatti OC Mine	0.375	0.487	
	Total	0.405	0.526	1577.22

1.3.3 Impact of Fire Control on Ambient Air Quality:

Due to unscientific mining prior to nationalization there are unstable sites identified in the BCCL. Out of 595 unstable sites identified in the Master Plan , 8 sites consisting of 713 no. of houses/families are affected .The affected families will be rehabilitated in adjacent non coal bearing area.

1.3.4Impact of Resettlement on Ambient Air Quality:

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

1.4 Meteorological Data

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

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

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

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

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

Table 1.2: SEASONAL WIND DISTRIBUTION

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

Wind Direction	Wind Velocity (m/s) & Duration (%)				
	< 0.5	0.6 -1.5	1.6 -3.5	>3.5	Total
N		1.61	0.78	0.00	2.38
NNE		0.83	0.37	0.00	1.19
NE		3.17	1.47	0.05	4.67

Wind Direction	Wind Velocity (m/s) & Duration (%)				
	< 0.5	0.6 -1.5	1.6 -3.5	>3.5	Total
ENE		0.41	0.14	0.00	0.55
E		1.10	0.69	0.00	1.79
ESE		0.50	0.37	0.00	0.87
SE		1.28	0.41	0.05	1.74
SSE		0.64	0.18	0.00	0.82
S		0.41	0.09	0.00	0.50
SSW		0.28	0.05	0.00	0.32
SW		2.29	0.60	0.00	2.88
WSW		1.06	0.41	0.00	1.47
W		8.99	2.48	0.00	11.45
WNW		1.24	1.01	0.00	2.24
NW		11.47	4.22	0.05	15.71
NNW		2.11	0.73	0.00	2.84
CALM	48.40	-	-	-	48.40
Total	48.40	37.32	13.97	0.15	100

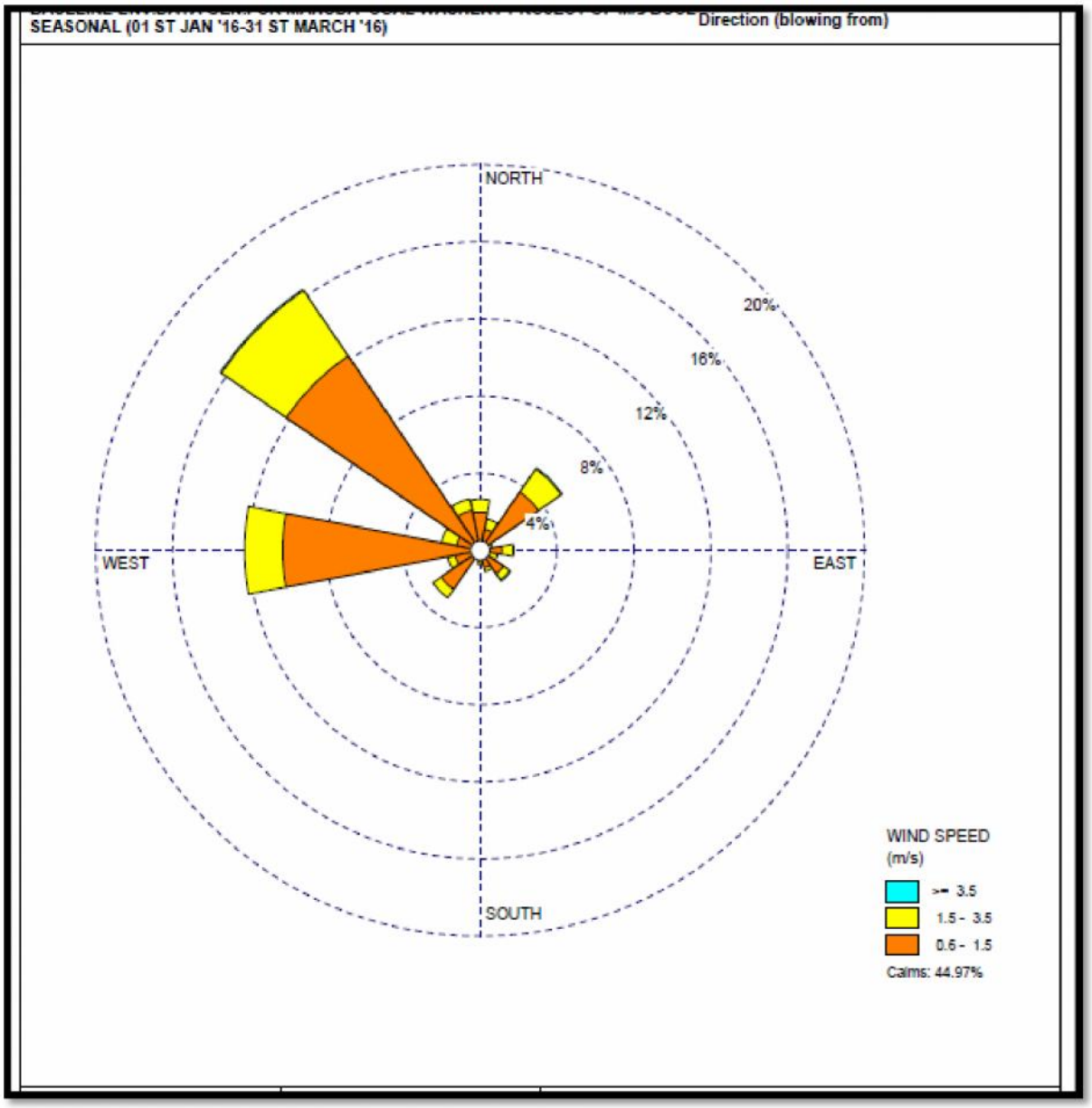


Figure No.-1.1 Wind Rose diagram for the period 1St Jan to 31St March 2016

Chapter – II

Fugitive Dust Generation Due To Movement of Coal

2.1 Introduction

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

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

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

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

2.2 Movement of Coal

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

2.2.1 Lohapatti Colliery :

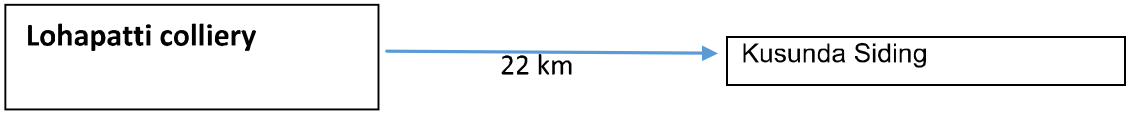


Table: 2.1 Dust Generation (Kg/day)

Name of the Mine	Year	Location	Distance from Face to Siding (Km)	Coal Transferred	Daily Coal Production (Te/Day)	Capacity of the Dumper	Vehicle Kilometer Travelled	Emission Rate for PM 10 (kg/VKT)	Pollution Load * Dust Generated Per Day (Kg/day)	Dust generated Kg/per tonne
Lahapatti Colliery	13-14	Kusunda Siding	22.00	67962	206.00	20.00	453.20	0.53	240.196	
		Total for 13-14			**206.00**				**240.196**	1.17
	14-15	Kusunda Siding	22.00	835	3.00	20.00	6.60	0.53	3.498	
		Total for 14-15			**3.00**				**3.498**	1.17
	15-16	Kusunda Siding	22.00	1481	4.00	20.00	8.80	0.53	4.664	
		Total for 15-16			**4.00**				**4.664**	1.17

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

2.3 Optimum Coal Transportation scheme in the Present Scenario:

Phase – I (for 10 + 05 Years)

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

2.4 Conceptual Plan of Proposed Integrated Coal Transportation Network for the Cluster:

Phase – II (after 15 Years):

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

During 2015-16, the combined daily coal production of the Cluster was 1481 tones resulting in 1727 kg of daily fugitive dust generation. The dust (PM-10) generation rate at present is 1.17 kg/te

As a result of replacement of existing road transportation of coal by Conveyor to railway siding will result in reduction of fugitive dust generation to the extent of 185853 kg/day for daily coal production of 159394 tonnes (0.526 MTY) during Phase –II.

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

Cluster	Mines in Operation in Phase - II	Production Capacity (MTY)	Proposed Transport Infrastructure in Phase – II
XIV	Lohapatti colliery	0.526	**Coal transport by Conveyor to Railway Siding**
	Total	0.536 MTY = 159394 tonnes /Day	

2.5 Conclusion:

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

Phase – I :(2013-14 to 2028 -29) :

1. During Phase – I, business as usual(BAU) scenario will prevail and the existing road cum rail transport network system will be used for coal dispatch to the consumers. During 2015-16, the combined daily coal production of the Cluster was 1481 tones resulting in 1727 kg of daily fugitive dust generation. The dust (PM-10) generation rate at present is 1.17 kg/te.
2. The generation of fugitive dust due to transportation of coal by road can be further reduced by enforcing covering of loaded trucks, periodical removal of loose materials lying on the road surface and black topping of coal transportation roads.
3. Avenue plantation, effective wetting of the road surface and proper maintenance of roads will further result in mitigation of the impact of road generated dust on ambient air quality.
4. Better road condition, by the use of Mechanical Sweeper or vacuum cleaner dust generation may be minimized.

Phase – II :(From 2029-30 Onwards):

As a result of replacement of existing road transportation of coal by Conveyor to railway siding will result in reduction of fugitive dust generation to the extent of 185853 kg/day for daily coal production of 159394 tonnes (0.526 MTY) during Phase –II.

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

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

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

Year	Coal Production (Te/day)	Dust Generation(Kg/Day)
2015-16 (By Road transportation)	4	1727
2029-30 (Considering peak production and all the coal transported through Road)	159394	1858534
2029-30(By Conveyor Transportation)	159394	0

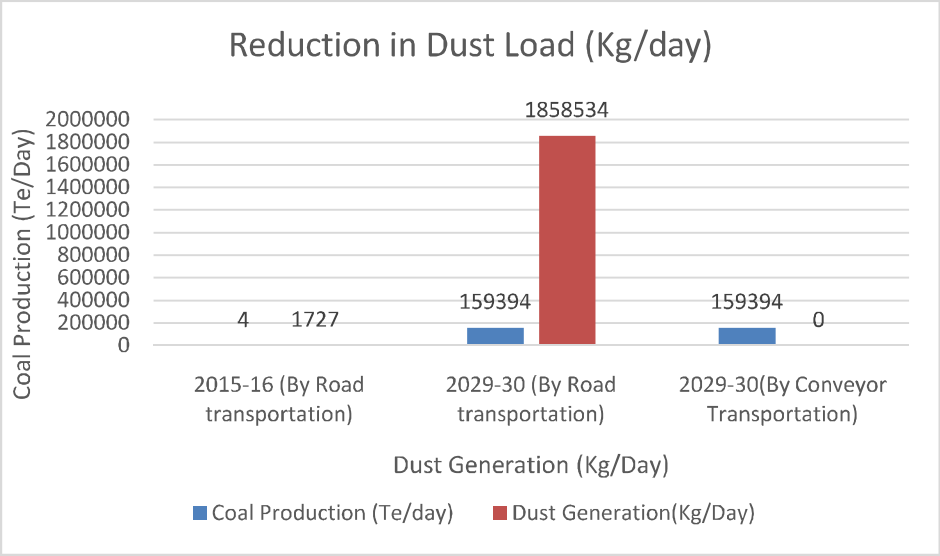


Figure 2.1: Presentation of reduction in dust generation due to replacement of Road transportation by Conveyor system.

ANNEXURE- IV

Vegetation Cover Mapping of Jharia Coalfield based on Satellite Data of the Year- 2016

Submitted to

Bharat Coking Coal Ltd (BCCL)

Dhanbad

March 2017

cmpdi

A Mini Ratna Company

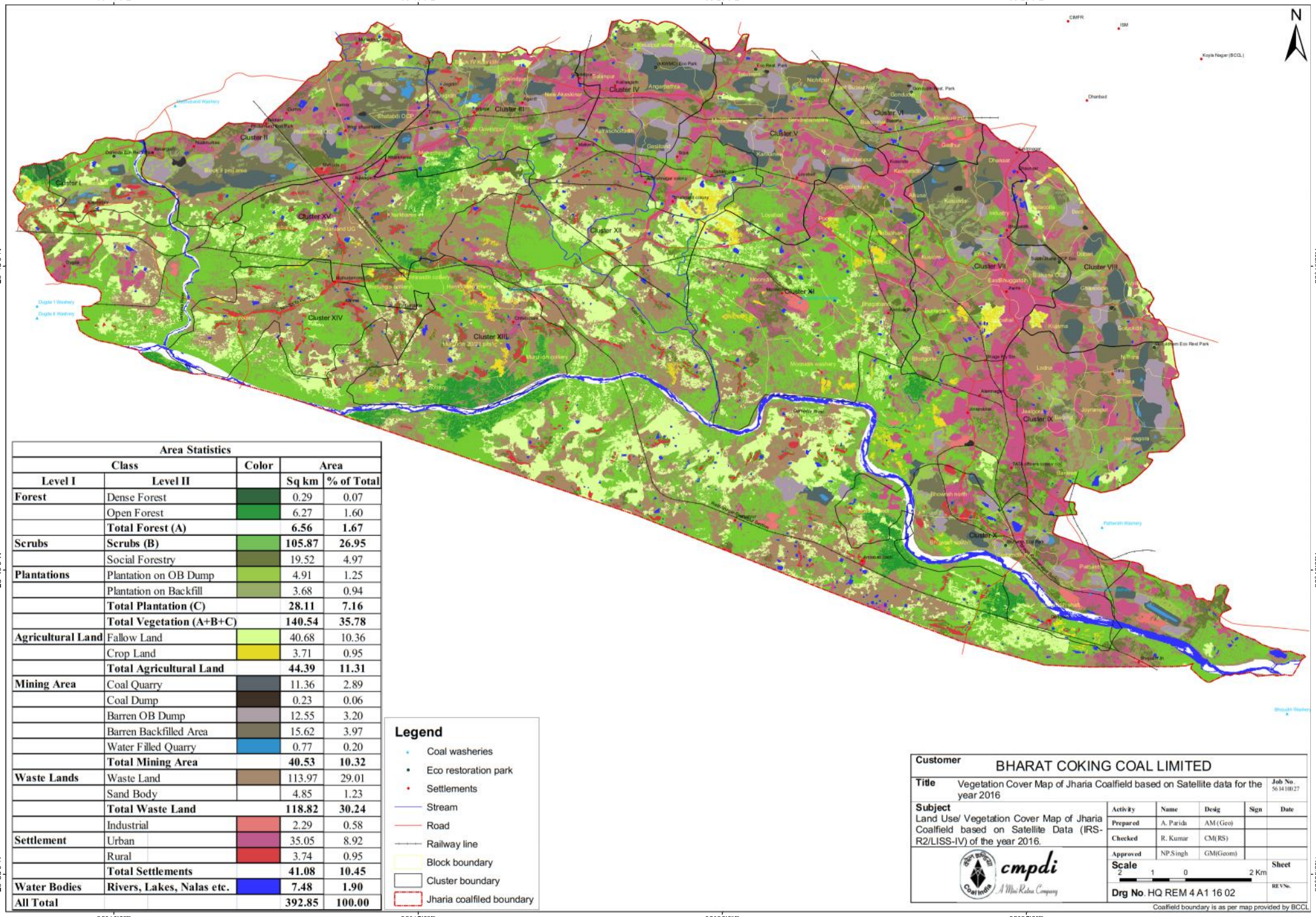
Vegetation Cover Mapping of Jharia Coalfield based on Satellite Data of the Year- 2016

March-2017

Remote Sensing Cell
Geomatics Division
CMPDI, Ranchi

Document Control Sheet

(1)	Job No.	RSC/561410027
(2)	Publication Date	March 2017
(3)	Number of Pages	49
(4)	Number of Figures	6
(5)	Number of Tables	10
(6)	Number of Plates	17
(7)	Title of Report	Vegetation cover mapping of Jharia Coalfield based on satellite data for the year 2016.
(8)	Aim of the Report	To prepare Land use and vegetation cover map of Jharia Coalfield on 1:50000 scale based on satellite data for monitoring the impact of coal mining on land use pattern and vegetation cover & also to prepare cluster wise Land use/ Cover maps falling under Jharia Coalfield.
(9)	Executing Unit	Remote Sensing Cell, Geomatics Division Central Mine Planning & Design Institute Limited, Gondwana Place, Kanke Road, Ranchi 834008
(10)	User Agency	Coal India Ltd.(CIL) / Bharat Coking Coal Ltd.(BCCL)
(11)	Authors	Ms Ayesha Parida, Assistant Manager (Remote Sensing)
(12)	Security Restriction	Restricted Circulation
(13)	No. of Copies	5
(14)	Distribution Statement	Official



Area Statistics

Class		Color	Area	
Level I	**Level II**		**Sq km**	**% of Total**
Forest	Dense Forest		0.29	0.07
	Open Forest		6.27	1.60
	Total Forest (A)		**6.56**	**1.67**
Scrubs	**Scrubs (B)**		**105.87**	**26.95**
	Social Forestry		19.52	4.97
Plantations	Plantation on OB Dump		4.91	1.25
	Plantation on Backfill		3.68	0.94
	Total Plantation (C)		**28.11**	**7.16**
	Total Vegetation (A+B+C)		**140.54**	**35.78**
Agricultural Land	Fallow Land		40.68	10.36
	Crop Land		3.71	0.95
	Total Agricultural Land		**44.39**	**11.31**
Mining Area	Coal Quarry		11.36	2.89
	Coal Dump		0.23	0.06
	Barren OB Dump		12.55	3.20
	Barren Backfilled Area		15.62	3.97
	Water Filled Quarry		0.77	0.20
	Total Mining Area		**40.53**	**10.32**
Waste Lands	Waste Land		113.97	29.01
	Sand Body		4.85	1.23
	Total Waste Land		**118.82**	**30.24**
	Industrial		2.29	0.58
Settlement	Urban		35.05	8.92
	Rural		3.74	0.95
	Total Settlements		**41.08**	**10.45**
Water Bodies	**Rivers, Lakes, Nalas etc.**		**7.48**	**1.90**
All Total			**392.85**	**100.00**

Customer BHARAT COKING COAL LIMITED

Title Vegetation Cover Map of Jharia Coalfield based on Satellite data for the year 2016

Job No. 56141027

Subject Land Use/ Vegetation Cover Map of Jharia Coalfield based on Satellite Data (IRS-R2/LISS-IV) of the year 2016.

Activity	Name	Desig	Sign	Date
Prepared	A. Parida	AM (Geo)		
Checked	R. Kumar	CM(RS)		
Approved	NP.Singh	GM(Geom)		

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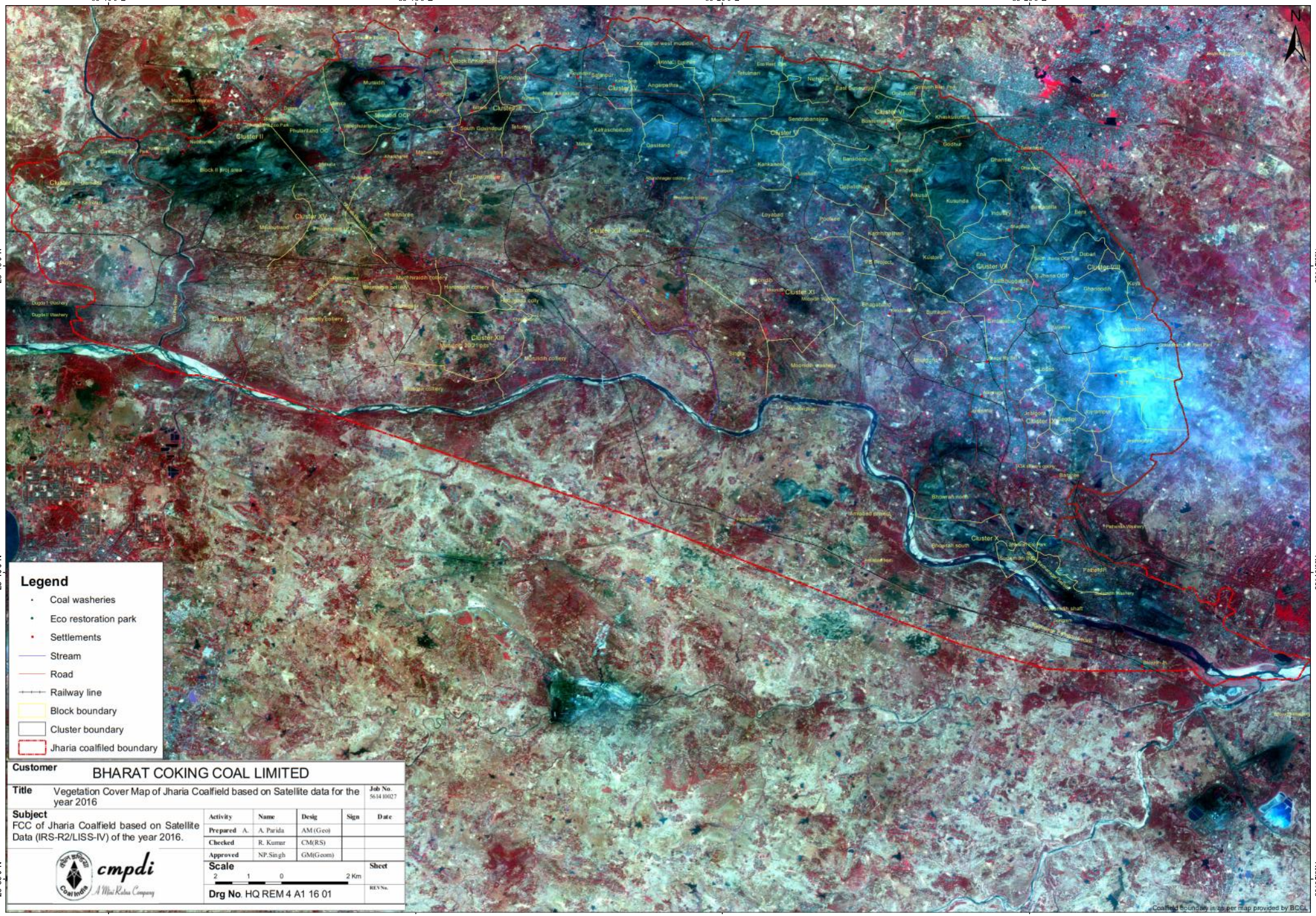
Scale 2 1 0 2 Km

Sheet **REVNo.**

Drg No. HQ REM 4 A1 16 02

Coalfield boundary is as per map provided by BCCL


86°10'0"E
86°15'0"E
86°20'0"E
86°25'0"E
23°45'0"N
23°40'0"N
23°35'0"N
N
Legend
Coal washeries
Eco restoration park
Settlements
Stream
Road
Railway line
Block boundary
Cluster boundary
Jharia coalfiled boundary
Customer
BHARAT COKING COAL LIMITED
Title
Vegetation Cover Map of Jharia Coalfield based on Satellite data for the year 2016
Job No. 5614 10027
Subject
FCC of Jharia Coalfield based on Satellite Data (IRS-R2/LISS-IV) of the year 2016.
Activity | Name | Desig | Sign | Date
Prepared A. | A. Parida | AM (Geo)
Checked | R. Kumar | CM(RS)
Approved | NP.Singh | GM(Geom)
Scale
2 1 0 2 Km
Sheet
Drg No. HQ REM 4 A1 16 01
REV No.
cmpdi
A Mini Ratna Company
Coalfield boundary is as per map provided by BCCL

ANNEXURE-V

BHARAT COKING COAL LIMITED

(A Subsidiary of Coal India Limited – A Maharatna Company)

CORPORATE ENVIRONMENTAL POLICY

Bharat Coking Coal Limited (BCCL), a subsidiary of Coal India Limited, is a Public Sector Undertaking engaged in mining of coal and allied activities. It is the only producer of Prime Coking Coal in India. BCCL was incorporated in 1972 to operate coking coal mines operating in the Jharia and Raniganj Coalfields. Currently, the Company operates 66 coal mines and 8 Coal Washeries.

Our mission is to produce the planned quantity of coal efficiently and economically with due regard to safety, conservation and quality. BCCL affirms its commitment for environment friendly mining with right mitigation of pollution, reclamation of the degraded land, preservation of biodiversity and proper disposal of waste following the best environmental practices including judicious use of the non-renewable energy on the path of continual improvement. Towards this commitment, BCCL shall endeavor to:

- Conduct mining and associated operations in an environmentally responsible manner to comply with applicable laws and other requirements related to environmental aspects.
- Design projects with due consideration of Sustainable Development by integrating sound environmental management practices in all our activities.
- Prevent pollution of surrounding habitation by continuous monitoring and adopting suitable measures for environment protection.
- Ensure compliance of all applicable Environmental and Forest Clearance conditions and other statutory conditions issued by regulatory agencies.
- Implement the Environmental Management Plans in all our mines effectively to mitigate pollutions on air, water and noise; proper disposal of wastes and reclamation and ecological restoration of degraded land; and by also dovetailing the Jharia action/ Master Plan for dealing with Fires, Subsidence and Rehabilitation of affected people with the Environmental Management Plans under the Cluster Concept.
- Strive to conserve Bio-Diversity through Ecological restoration methods.
- Conserve natural resources through recycling of wastes on the principle of Reduce, Recycle and Reuse. Put special thrusts on efficient energy utilization as a measure to reduce carbon foot-print.
- Strive for continual improvement in our environmental performances by setting targets, measuring progress and taking corrective action.
- Create environmental awareness among the employees and the local communities through pro-active communication and training and encourage our business associates to adopt similar approach for environmental protection.

Place: Dhanbad
Date: 25.5.12

Chairman-cum-Managing Director

Chairman-cum-Mg. Director
BHARAT COKING COAL LIMITED
Koyla Bhawan, Dhanbad-826 005

भारत कोकिंग कोल लिमिटेड
(कोल इंडिया का एक उपक्रम)
पंजीकृत कार्यालय : कोयला भवन, कोयला नगर,
धनबाद–826005
सीआइएन : U10101JH1972GOI000918
महाप्रबंधक का कार्यालय
पश्चिमी झरिया क्षेत्र
पो. मुनीडीह, जिला: धनबाद (झारखण्ड)–828129
फोन नं. 0326 2273483; फेक्स: 0326 2273445, ई-मेल: cgmwj@bccl.gov.in

Bharat Coking Coal Limited
(A Subsidiary of Coal India Limited)
Regd. Off. : Koyla Bhawan, Koyla Nagar
Dhanbad - 826005
CIN : U10101JH1972GOI000918
OFFICE OF THE GENERAL MANAGER
WESTERN JHARIA AREA
PO: MOONIDIH, DISTT: DHANBAD (JHARKHAND) - 828129
PHONE NO: 0326 2273483, FAX NO: 0326 2273445, e-mail : cgmwj@bccl.gov.in

ANNEXURE -III

MOONIDIH HOSPITAL
W.J.Area

Subject: Details of CSR activities from 26/3/18 to 25/11/18.

Period	CSR CLINIC	WELLNESS	BANDE MATARAM
26/3/18 TO 25/4/18	716	17	NIL
26/4/18 TO 10/5/18	274	NIL	08
11/5/18 TO 25/5/18	359	NIL	14
26/5/18 TO 10/6/18	313	NIL	15
11/6/18 TO 25/6/18	340	62	NIL
26/6/18 TO 10/7/18	325	5	10
11/7/18 TO 25/7/18	397	70	9
26/7/18 TO 10/8/18	428	46	13
11/8/18 TO 25/8/18	421	53	6
26/8/18 TO 10/9/18	507	61	15
11/9/18 TO 25/9/18	520	56	9
26/9/18 TO 10/10/18	424	55	10
11/10/18 TO 25/10/18	374	15	11
26/10/18 TO 10/11/18	444	27	6
11/11/18 TO 25/11/18	256	35	12

2.

Name of Camp	Date	No. of beneficiaries	Place
Awareness camp (Seasonal Disease)	14/6/18	36	CISF CAMP
Medical Village camp	22/6/18	52	Karitand
Hypertension Awareness camp	16/6/18	34	Mnd Hospital
---------DO--------	6/7/18	42	Mnd Hospital
----------DO--------	23/7/18	46	Mnd Hospital
Woman Health awareness camp	18/7/18	24	CISF CAMP
Hypertension Awareness camp	19/7/18	24	CISF CAMP
Medical Village camp	26/7/18	173	Dhobni Basti
Hypertension Awareness camp	23/8/18	51	Mnd Hospital
Diabetic Awareness camp	31/8/18	32	CISF CAMP
Health Awareness camp	27/9/18	30	CISF CAMP
Hypertension Awareness camp	25/10/18	54	Mnd Hospital

ANNEXURE - VI

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

ENVIRONMENTAL MONITORING REPORT OF BHARAT COKING COAL LIMITED, CLUSTER – XIV

(FOR THE MONTH JULY, 2018)

E. C. no. J-11015/10/2010-IA.II (M) dated 06.06.2013.

CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

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) Lohapatti (A20): Industrial Area

The location of the sampling station is 23º 44' 29.42'' N & 86º 12' 49.96'' E. The sampler was placed at a height of approx. 1.5m above ground level at Project Office.

II. BUFFER ZONE Monitoring Location

i) Kharkharee CISF Office (A21): Industrial Area

The location of the sampling station is 23º46' 29.00''N & 86º 14' 37.08''E. The sampler was placed at a height of approx. 1.5m above ground level at Safety Office.

ii) Telmachho Bridge (A32): Industrial Area

The location of the sampling station is 23º 44' 14.90'' N & 86º 12' 21.20'' E The location was selected for studying the impact of the mining activity on the Telmachho Bridge area as it lies in the buffer zone for the Cluster XIV.

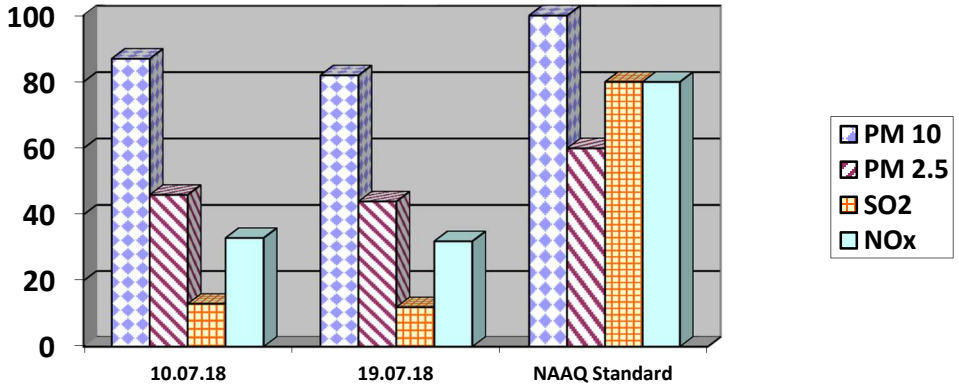
iii) Madhuband UGP Office (A33): Industrial Area

The location of the sampling station is 23º 45'24.48'' N & 086º11'59.44''E. The sampler was placed at a height of approx. 1.5m above ground level at Safety Office.

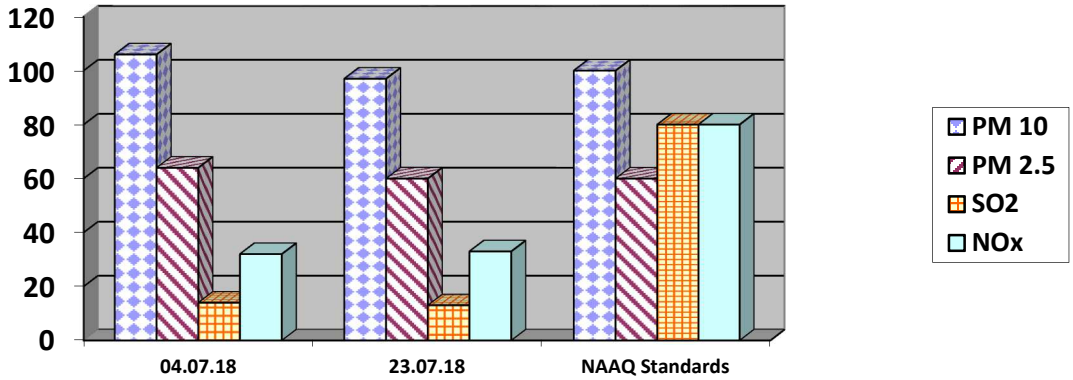
AMBIENT AIR QUALITY DATA

Cluster – XIV, Bharat Coking Coal Ltd Month: **JULY,2018** Year : **2018-19.**

Station Name: A20, Lohapatti		Zone: Core		Category: Industrial	
Sl. No.	**Dates of sampling**	**PM 10**	**PM 2.5**	**SO_2**	**NO_x**
1	10.07.18	87	46	13	33
2	19.07.18	82	44	12	32
	NAAQ Standard	100	60	80	80



Station Name: A21Kharkharee		Zone: Buffer		Category: Industrial	
Sl. No.	**Dates of sampling**	**PM 10**	**PM 2.5**	**SO2**	**NOx**
1	04.07.18	106	64	14	32
2	23.07.18	97	60	13	33
	NAAQ Standards	100	60	80	80



Analysed By
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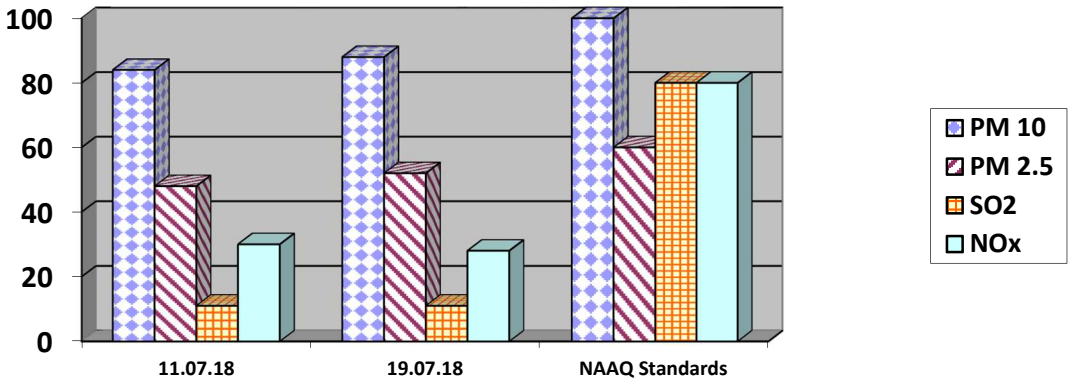
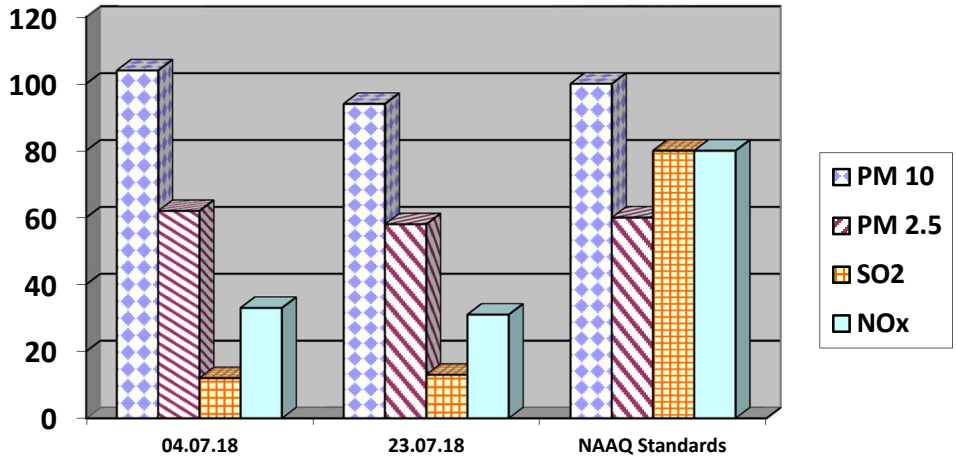
Station Name: A32Telmaccho Bridge		Zone: Buffer		Category: Residential	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	11.07.18	84	48	11	30
2	19.07.18	88	52	11	28
	NAAQ Standards	100	60	80	80



Station Name: A33 Madhuband UGP		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	04.07.18	104	62	12	33
2	23.07.18	94	58	13	31
	NAAQ Standards	100	60	80	80



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

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WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. – II**)

i) **Mine Discharge of Block II (MW14)**

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

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 at the Environmental Laboratory of CMPDI RI-II, Dhanbad.

3.3 Results & Interpretations

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

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: **Cluster -XIV**		Month: **JULY, 2018**	Name of the Station: **Mine Discharge of Lohapatti**	
Sl. No.	**Parameters**	**MW14** First Fortnight	**MW14** Second Fortnight	**As per MOEF General Standards for schedule VI**
		13-07-2018	20-07-2018	
1	Total Suspended Solids	26	34	*100 (Max)*
2	pH	7.99	8.07	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	24	32	*250 (Max)*

All values are expressed in mg/lit unless specified.

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RI-2, CMPDI, Dhanbad

NOISE LEVEL QUALITY MONITORING

4.1Location of sampling sites

i) **Lohapatti (N20)**
ii) **Kharkharee CISF Office (N21)**
iii) **Telmacho Bridge (N32)**
iv) **Madhuband UGP (N33)**

4.2 Methodology of sampling and analysis

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

4.3 Results & Interpretations

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

NOISE LEVEL DATA

Name of the Project : **Cluster -XIV**			Month: **JULY, 2018**		
Sl. No.	**Station Name/Code**	**Category of area**	**Date**	**Noise level dB(A)LEQ**	***Permissible Limit of Noise level in dB(A)***
1	**Lohapatti (N20)**	**Industrial area**	10.07.18	61.7	*75*
2	**Lohapatti (N20)**	**Industrial area**	19.07.18	62.8	*75*
3	**Kharkharee CISF Office (N21**	**Industrial area**	04.07.18	63.2	*75*
4	**Kharkharee CISF Office (N21**	**Industrial area**	23.07.18	62.7	*75*
5	**Telmacho Bridge (N32)**	**Residential area**	11.07.18	52.8	*55*
6	**Telmacho Bridge (N32)**	**Residential area**	19.07.18	51.7	*55*
7	**Madhuband UGP (N33)**	**Industrial area**	04.07.18	62.3	*75*
8	**Madhuband UGP (N33)**	**Industrial area**	23.07.18	63.2	*75*

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

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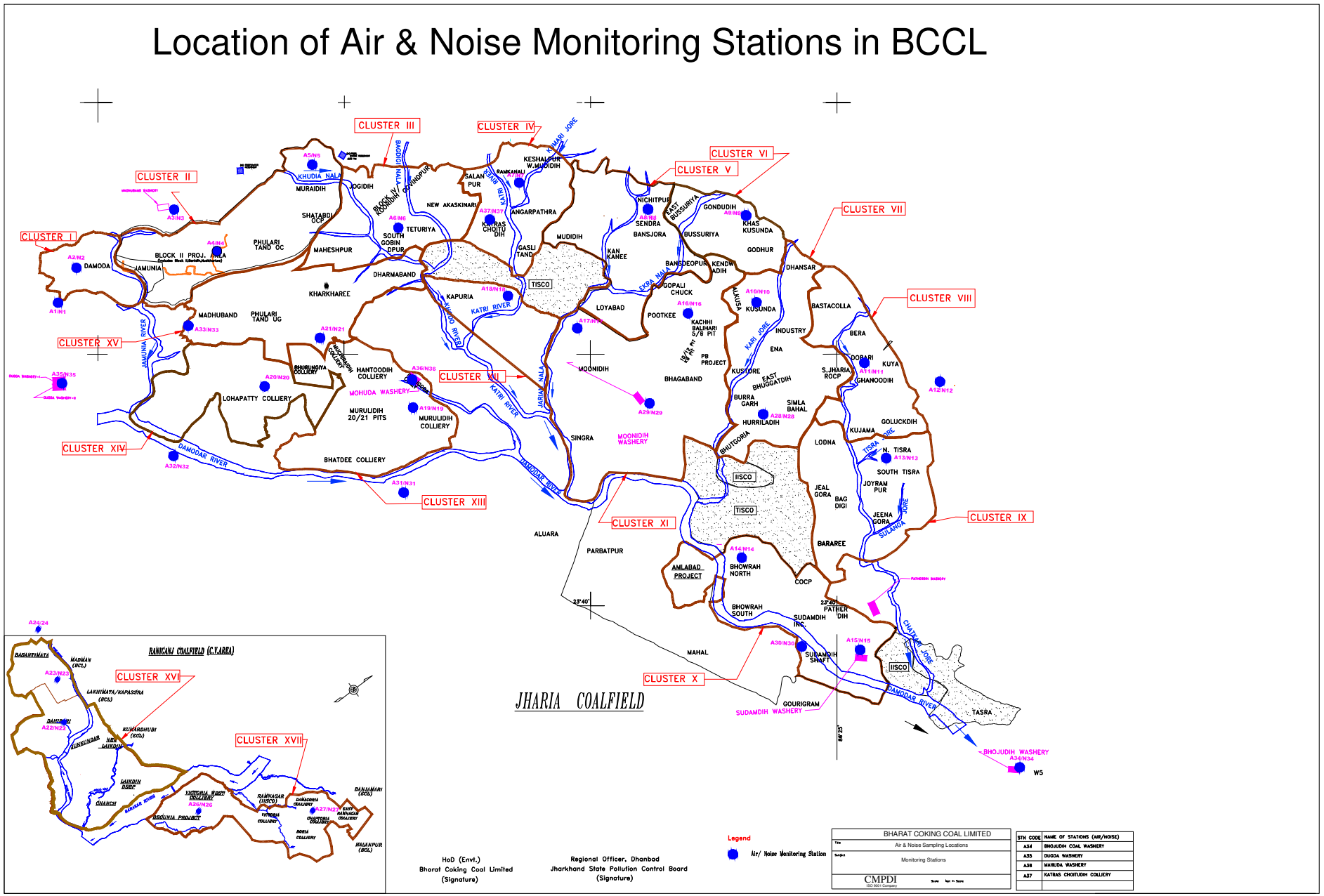
Location of Air & Noise Monitoring Stations in BCCL



HoD (Envt.)
Bharat Coking Coal Limited
(Signature)

Regional Officer, Dhanbad
Jharkhand State Pollution Control Board
(Signature)

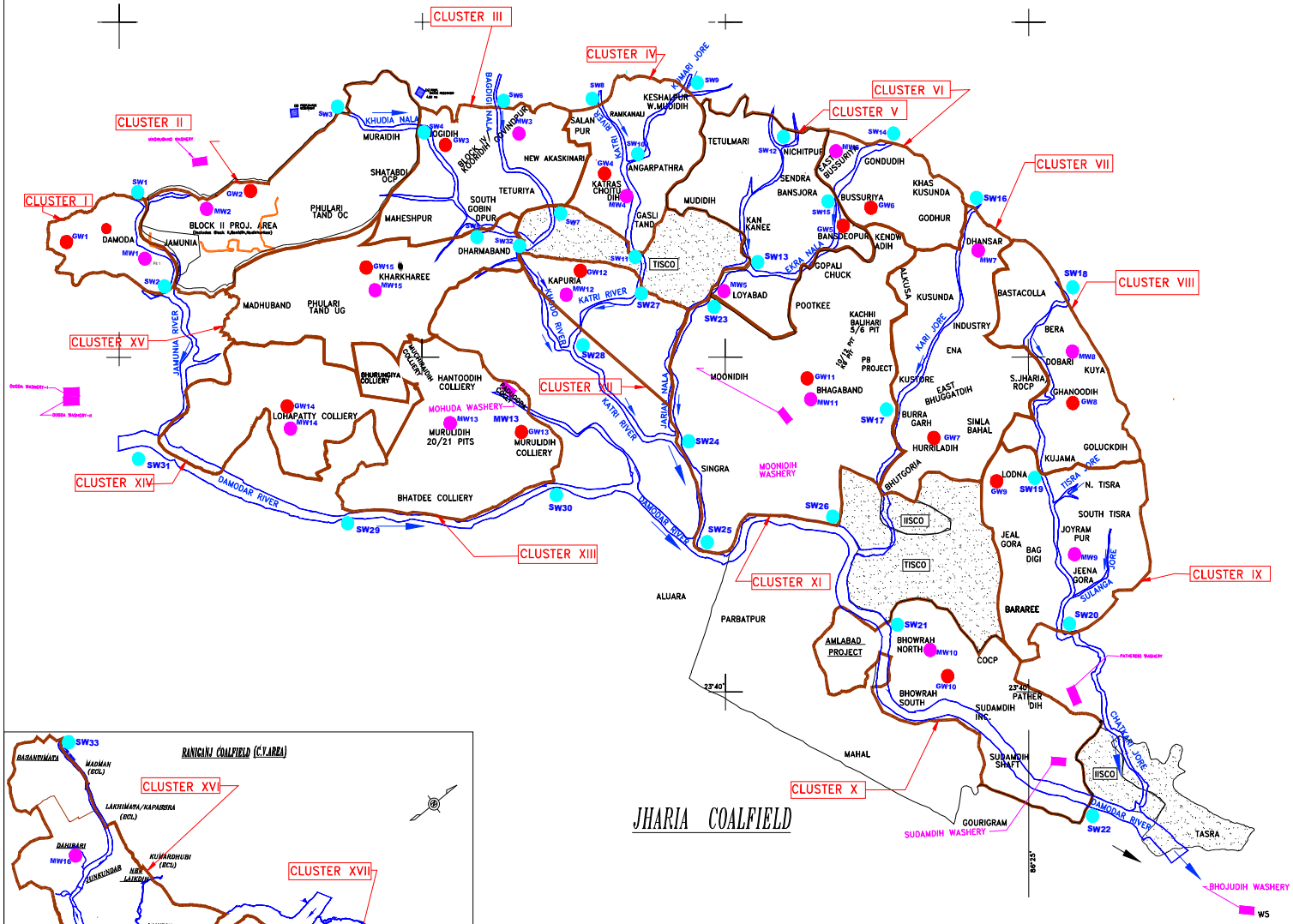
Legend

Air/ Noise Monitoring Station

BHARAT COKING COAL LIMITED	
Title	Air & Noise Sampling Locations
Subject	Monitoring Stations
CMPDI (ISO 9001 Company)	Scale: Not To Scale

STN CODE	NAME OF STATIONS (AIR/NOISE)
A34	BHOJUDIH COAL WASHERY
A35	DUGDA WASHERY
A38	MANUDA WASHERY
A37	KATRAS CHOITUDIH COLLIERY

Water Sampling Locations in BCCL



INDEX

Cluster	Suface 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	Ghutway Village
II	SW3, SW4	Khudia Nala	MW2	Block II OCP	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Khudia Nala, Bagdigi Nala	MW3	Govindpur Colliery	GW3	Jogidih Village
IV	SW8, SW11, SW9, SW10	Katri River Kumari Jore	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudidih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kari Jore	MW7	Dhansar UGP	GW7	Hurriladih
VIII	SW18, SW19	Kashi Jore	MW8	Dobari UGP	GW8	Ghanudih
IX	SW19, SW20	Kashi Jore	MW9	Jeenagora	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband h UGP	GW11	Bhagabandh
XII	SW27, SW28	Katri River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Murulidih (20/21)	GW13	Murilidih
XIV	SW31, SW29	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Khudia Nala	MW15	Kharkharee UGP	GW15	Kharkharee
XVI	SW33, SW34	Khudia River	MW16	Dahibari OCP	GW16	Patlabari Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria

HoD (Envt.)
Bharat Coking Coal Limited
(Signature)

Regional Officer, Dhanbad
Jharkhand State Pollution Control Board
(Signature)

Legend
- Sampling Locations of Surface Water (Upstream/ Downstream)
- Sampling Locations of Mine Water
- Sampling Locations of Ground/ Drinking Water

Customer: BHARAT COKING COAL LIMITED
Title: WATER SAMPLING LOCATIONS
Subject: MONITORING STATIONS
CMPDI
ISO 9001 Company
Scale: Not to Scale

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ENVIRONMENTAL QUALITY REPORT OF BHARAT COKING COAL LIMITED, CLUSTER – XIV

(FOR THE Q.E. JUNE 2018)

E. C. no. J-11015/10/2010-IA.II (M) dated 06.06.2013.

CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

ENVIRONMENTAL QUALITY REPORT OF BHARAT COKING COAL LIMITED CLUSTER – XIV

(FOR THE Q.E. JUNE 2018)

E. C. no. J-11015/10/2010-IA.II (M) dated 06.06.2013.

CMPDI

ISO 9001 Company

Regional Institute-II

Dhanbad, Jharkhand

Respirable Dust Samplers (RDS) & fine particulates for PM 2.5 sampler were used for sampling PM 10 & PM 2.5 respectively. These heavy metals are analyzed regularly on half yearly basis. The samples were analyzed in Environmental Laboratory of CMPDI, RI-II, Dhanbad.

4.0 Results and interpretations

4.1 Water quality

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

4.2 Heavy Metal in Ambient Air

The results of Heavy metal in Ambient Air Quality are presented in tabular form for each monitoring station. The concentration of heavy metals in ambient air is well within the permissible limit.

AMBIENT AIR QUALITY DATA

Name of the Company: **Bharat Coking Coal Limited** Year : **2018-19.**
Name of the Cluster : **Cluster -I** PERIOD: **Q. E. JUNE- 2018.**

MONTH: JUNE 2018

Heavy Metal Analysis report of Ambient Air Quality

SAMPLE	Cadmium(Cd) (µg/m3)	Mercury(Hg) (µg/m3)	Arsenic(As) (ng/m3)	Chromium(Cr) (µg/m3)	Nickel (Ni) (ng/m3)	Lead (Pb) (µg/m3)
Lohapatti (A20)	<0.001	<0.001	<0.005	0.02	<0.01	<0.005
Kharkharee CISF Office (A21)	<0.001	<0.001	<0.005	0.03	<0.01	<0.005
Telmachho Bridge (A32)	<0.001	<0.001	<0.005	0.03	0.01	<0.005
Madhuband UGP Office (A33)	<0.001	<0.001	<0.005	0.01	<0.01	<0.005

Analysed By
JSA/SA/SSA

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

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

CHAPTER – II

WATER QUALITY MONITORING

3.1 Location of sampling sites

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

i) Ground Water quality at **Lohapatti (GW14)**

ii) Surface Water quality at **U/S of Damodar River (SW31)**

iii) Surface Water quality at **D/S of Damodar River (SW29)**

iv) Mine effluent quality at **Lohapatti (MW14)**

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. Effluent samples were analyzed for 25 parameters on quarterly basis. The drinking and Surface water samples were collected and analyzed for 25 and 17 parameters respectively, on quarterly basis. Thereafter the samples were preserved and analyzed at the Environmental Laboratory at CMPDI RI-I,Asansol,West Bengal.

3.3 Results & Interpretations

The results are given in tabular form along with the applicable standards. Results show that most of the parameters are within the permissible limits.

WATER QUALITY

(SURFACE WATER- 17 PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2018-19**

Name of the Project : **Cluster - XIV** Period: **Q.E. JUNE 2018**

Project: Lohapatti **Cluster XIV**

Stations:

1. Upstream of Damodar river SW-31
2. Downstream of Damodar river SW-29

Date of Sampling:

04/06/2018

04/06/2018

Sl. No	Parameter	Sampling Stations				Detection Limit	IS:2296 – 1982 (Inland surface water) Class C	BIS Standard & Method
		SW-29	SW-31					
1	Arsenic (as As), mg/l, Max	<0.002	<0.002			0.002	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
2	BOD (3 days 27°C), mg/l, Max	<2.0	<2.0			2.00	300	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
3	Colour (Hazen Unit)	Colourless	colourless			Qualitative	300	Physical/Qualitative
4	Chlorides (as Cl), mg/l, Max	41	37			2.00	600	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	<0.03			0.001	1.5	IS 3025 /42 : 1992 R : 2009, AAS-Flame
6	Dissolved Oxygen, min.	3.8	4.0			0.10	4	IS 3025/381989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	0.35	0.29			0.02	1.5	APHA, 22nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	0.018	0.022			0.01	0.05	APHA, 22nd Edition, 1,5 - Diphenylcarbohydrazide
9	Iron (as Fe), mg/l, Max	<0.06	<0.06			0.06	50	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
10	Lead (as Pb), mg/l, Max	<0.005	<0.005			0.005	0.1	APHA, 22nd Edition AAS-GTA
11	Nitrate (as NO_3), mg/l, Max	4.44	4.02			0.50	50	APHA, 22nd Edition, UV-Spectrphotometric
12	pH value	8.02	8.17			2.5	6.5-8.5	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.002	<0.002			0.002	5.0	APHA, 22nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002			0.002	0.05	APHA, 22nd Edition AAS-GTA
15	Sulphate (as SO_4) mg/l, Max	108	104			2.00	400	APHA, 22nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	680	672			25.00	1500	IS 3025 /16:1984 R : 2006, Gravimetric
17	Zinc (as Zn), mg/l, Max	<0.002	<0.01			0.01	0.2	IS 3025 /49 : 1994, R : 2009, AAS-Flame

All values are expressed in mg/lit unless specified

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WATER QUALITY

(GROUND/DRINKING WATER- 25 PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2018-19**

Name of the Project : **Cluster - XIV** Period: **Q.E.JUNE 2018.**

Stations: **Date of Sampling:**

1. Drinking Water from Lohapatti DW-14 07.06.2018

Sl. No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		DW-14					
1	Boron (as B), mg/l, Max	<0.2			0.20	0.5	APHA, 22nd Edition ,Carmine
2	Colour,in Hazen Units	1			1	5	APHA, 22nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	58.9			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	64			2.00	250	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.001			0.001	0.05	IS 3025/42 : 1992 R : 2009, AAS-Flame
6	Fluoride (as F) mg/l, Max	0.59			0.02	1.0	APHA, 22nd Edition , SPADNS
7	Free Residual Chlorine, mg/l, Min	<0.02			0.02	0.2	APHA, 22nd Edition, DPD
8	Iron (as Fe), mg/l, Max	<0.06			0.06	0.3	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
9	Lead (as Pb), mg/l, Max	<0.005			0.005	0.01	APHA, 22nd Edition, AAS-GTA
10	Manganese (as Mn), mg/l, Max	<0.02			0.02	0.1	IS-3025/59:2006, AAS-Flame
11	Nitrate (as NO_3), mg/l, Max	18.6			0.5	45	APHA, 22nd Edition, UV-Spectrphotometric
12	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	7.59			2.5	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric
14	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.001			0.001	0.001	APHA, 22nd Edition,4-Amino Autipyrine
15	Selenium (as Se), mg/l, Max	<0.002			0.002	0.01	APHA, 22nd Edition, AAS-GTA
16	Sulphate (as SO_4) mg/l, Max	150			2.00	200	APHA, 22nd Edition. Turbidity
17	Taste	Acceptable			Qualitative	Acceptable	APHA, 22nd Edition. Taste
18	Total Alkalinity (c_aco_3),, mg/l, Max	122			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	414			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c_aco_3), mg/l, Max	110			4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	1			1.0	1	IS-3025/10:1984 R-1996, Nephelometric
24	Zinc (as Zn), mg/l, Max	<0.01			0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame
25	Nickel (as Ni), mg/l, Max	<0.005			0.005	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

All values are expressed in mg/lit unless specified.

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WATER QUALITY

(MINE EFFLUENT - 27 PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2018-19**

Name of the Project : **Cluster - XIV** Period: **Q.E. JUNE 2018.**

Stations: **Date of Sampling:**

1. Mine Water Discharge Lohapatti MW-14 21/06/2018

Sl.No.	Parameter	Sampling Stations			Detection Limit	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		MW-14	2	3			
1	Ammonical Nitrogen, mg/l, Max	0.2			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			2.00	30.0	IS 3025 /44:1993,R:2003 3 day incubation at 27°C
4	Colour	colourless			Qualitative	Qualitative	Physical/Qualitative
5	COD, mg/l, Max	20			4.00	250.0	APHA, 22nd Edition, Closed Reflux, Titrimetric
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	0.5			0.30	5.0	APHA, 22nd Edition Molybdovanadate
8	Fluoride (as F) mg/l, *Max*	0.25			0.02	2.0	APHA, 22nd Edition, SPADNS
9	Free Ammonia, mg/l, Max	<0.01			0.01	5.0	IS:3025/34:1988, Nesseler's
10	Hexavalent Chromium, mg/l, Max	0.075			0.01	0.1	APHA, 22nd Edition, Diphenylcarbohydrazide
11	Iron (as Fe), mg/l, *Max*	0.92			0.06	3.0	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
12	Lead (as Pb), mg/l, *Max*	<0.005			0.005	0.1	APHA, 22nd Edition, AAS-GTA
13	Manganese(as Mn), mg/l, Max	<0.02			0.02	2.0	IS-3025/59:2006, AAS-Flame
14	Nickel (as Ni), mg/l, *Max*	<0.005			0.005	3.0	IS-3025/54:2003, AAS-Flame
15	Nitrate Nitrogen, mg/l, *Max*	<0.5			0.50	10.0	APHA, 22nd Edition, UV-Spectrphotometric
16	Oil & Grease, mg/l, Max	<2.0			2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric
17	pH value	8.14			2.5	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
18	Phenolic compounds (as C_6H_5OH),mg/l, *Max*	<0.002			0.002	1.0	APHA, 22nd Edition 4-Amino Antipyrine
19	Selenium (as Se), mg/l, *Max*	<0.002			0.002	0.05	APHA, 22nd Edition, AAS-GTA
20	Sulphide (as SO_3), mg/l, Max	<0.005			0.005	2.0	APHA, 22nd Edition Methylene Blue
21	Temperature (°C)	31.5			Shall not exceed 5^0 C above the receiving temp.		IS-3025/09:1984, Thermometeric
22	Total Chromium (as Cr), mg/l, *Max*	<0.06			0.04	2.0	IS-3025/52:2003, AAS-Flame
23	Total Kjeldahl Nitrogen, mg/l, Max	1.4			1.00	100.0	IS:3025/34:1988, Nesseler's
24	Total Residual Chlorine, mg/l, Max	0.02			0.02	1.0	APHA, 22nd Edition, DPD
25	Total Suspended Solids, mg/l, Max	36			10.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
26	Zinc (as Zn), mg/l, *Max*	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame
27	Odour	Agreeable			Agreeable	Qualitative	Is-3015/5:1983/R:2012/Qualitative

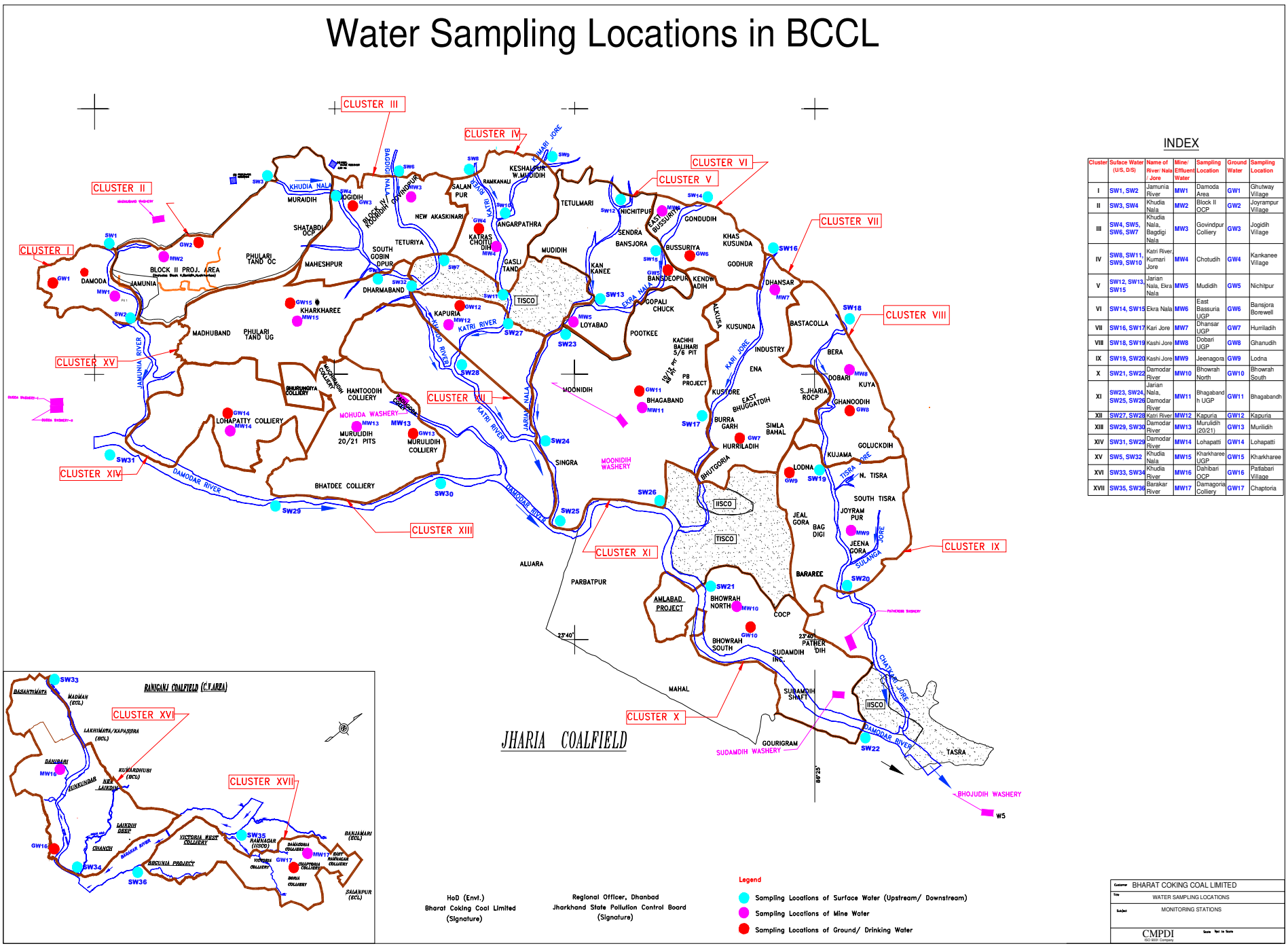
All values are expressed in mg/lit unless specified.

Analysed By
JSA/SA/SSA

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

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

Water Sampling Locations in BCCL



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Cluster	Suface 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	Ghutway Village
II	SW3, SW4	Khudia Nala	MW2	Block II OCP	GW2	Joyrampur Village
III	SW4, SW5, SW6, SW7	Khudia Nala, Bagdigi Nala	MW3	Govindpur Colliery	GW3	Jogidih Village
IV	SW8, SW11, SW9, SW10	Katri River, Kumari Jore	MW4	Chotudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudidih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kari Jore	MW7	Dhansar UGP	GW7	Hurriladih
VIII	SW18, SW19	Kashi Jore	MW8	Dobari UGP	GW8	Ghanudih
IX	SW19, SW20	Kashi Jore	MW9	Jeenagora	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Jarian Nala, Damodar River	MW11	Bhagaband h UGP	GW11	Bhagabandh
XII	SW27, SW28	Katri River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Murulidih (20/21)	GW13	Murulidih
XIV	SW31, SW29	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Khudia Nala	MW15	Kharkharee UGP	GW15	Kharkharee
XVI	SW33, SW34	Khudia River	MW16	Dahibari OCP	GW16	Patlabari Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria

HoD (Envt.)
Bharat Coking Coal Limited
(Signature)

Regional Officer, Dhanbad
Jharkhand State Pollution Control Board
(Signature)

Legend
- Sampling Locations of Surface Water (Upstream/ Downstream)
- Sampling Locations of Mine Water
- Sampling Locations of Ground/ Drinking Water

Customer	BHARAT COKING COAL LIMITED
Title	WATER SAMPLING LOCATIONS
Subject	MONITORING STATIONS
CMPDI (ISO 9001 Company)	Scale: Not to Scale

ANNEXURE-VII

A. Training from April'18 to Sept'18

No of employees (Departmental & Contractual) received training in Cluster XIV (April'18 to Sept'18)	
Types of Training	**Numbers**
Refresher Training	36