



Bharat Coking Coal Limited
(A Subsidiary of Coal India Limited)
Office of the Project Officer
Kapuria Project, Mahuda, Dhanbad.

Ref No :-BCCL/PO/KAPURIA/Env/2016/ 786

Date:- 18.11.2016

To the Director

Ministry of Environment, Forest & Climate Change

Regional Office (ECZ), Bungalow No. A-2

Shyamli Colony

Ranchi – 834002



Sub : six monthly report for the period from 1st April 2016 to 30th Sept 2016 on Compliance to Environmental Clearance from MoEF, Govt of India for Cluster – XII of Kapuria UG Project, M/s Bharat Coking Coal Limited.

Dear Sir

Enclosed herewith please find the six monthly report on Compliance to Environmental Clearance from MoEF, Govt of India vide letter no J-11015/184/2012-IA. II(M), dated 10th Dec 2014 for Cluster-XII of Kapuria UG of M/s Bharat Coking Coal Limited for your kind perusal and further needful action please. It is also to bring to your kind notice that the project has been delayed due to the delay in physical possession of land.

[Signature]
18/11/16

Project Officer

Kapuria Project

Encl : as above.

Copy to :

1. Director, IA, Monitor Cell, Paryavaran Bhawan, CGO Complex, New Delhi 110003.
2. GM W.J.A.BCCL
3. Dy GM (Env), BCCL
4. Office Copy

[Signature]
24/11/16

[Signature]
Sh. Amarendra Kumar Asst Mgr (Env)
Mrs. Mariya Akela Asst. Mgr (Env)

discuss and Examine
Follow-up status of other Areas.

[Signature]
25.11.16

Six Monthly Compliance Report of EC order of Cluster-XII for the period from 1st April 2016 to 30th Sept 2016

SI No	Specific Condition	Action
I	The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.	Project has not started yet. Land acquisition is under process. This condition shall be complied as the production starts.
II	A separate team for subsidence monitoring and surface mitigation measures be constituted and continuous monitoring and mitigation measures be carried out.	Shall be complied. Project is under construction phase.
III	The validity of EC is for the life of the mine or as specified in the EIA notification, 2006, whichever is earlier.	Agreed.
IV	The coal transportation from the mine to the siding shall be by conveyor belt and coal transportation from siding to washery shall be by rail.	Shall be complied.
V	Piezometers be installed upto the depth of mining to facilitate monitoring of ground water.	The work of monitoring of ground water is being carried out by CMPDI.
VI	Water sprinkler be used for coal dust suppression along the haul road.	Shall be complied.
VII	Thick green belt shall be developed around proposed washery within the cluster-XII lease area and plantation shall be undertaken along NH-32.	Shall be complied.
VIII	Subsidence study shall be taken up with reputed scientific agency as per stipulation of DGMS.	Shall be complied.
IX	Various CSR works that will be carried out shall include education, healthcare, water supply etc.	Shall be complied.
X	The project should have ecologist / social scientist to monitor the project.	BCCL is following the roadmap prepared by FRI, Dehradun to restore ecology in the region and conducting the work of ecological restoration in the mined out areas. BCCL has also got facilitated by the guidance of Prof. C R Babu, CEMDE, University of Delhi.
XI	Coal produced from the mine will be directly loaded into a CHP at the incline top. From the CHP at incline top, coal will be transported to the proposed Kapuria coal washery linked to the mine by covered conveyor system of length 250m. Washed coal from the washery will be transported by conveyor to the railway siding and loaded into the wagons by CHP.	Shall be complied.
XII	The production shall be within the same mining	Shall be complied.

	lease area.	
XIII	Regular monitoring of subsidence movement on the surface cover 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 clay soil / suitable material.	Shall be complied.
XIV	If subsidence is found exceeding the permitted limits, the land owners shall be adequately compensated with mutual agreement of the land owners.	Shall be complied.
XV	Mining shall be carried out as per statute at a safe distance from river / nallah falling adjacent to the lease boundary at the time of depillaring, protective bunds and garland drains shall be provided so that no water from the surface enters the subsidence area and the shaft.	Mining shall be done as per DGMS statute.
XVI	Sufficient coal pillars shall be left unextracted around the air shaft (within the subsidence influence area) to protect from any damage due to subsidence, if any.	Shall be complied.
XVII	Solid barriers shall be left below the roads falling within the blocks to any damage to the roads.	Shall be complied.
XVIII	Diversion of land shall be done with approval of the competent authority.	Shall be complied.
XIX	Coal extraction shall be optimized in areas where agriculture production is continuing. Some pillars shall be left below the agricultural land. No depillaring and coal extraction shall be carried out below habitation, HT lines & beneath road, water bodies, railway track.	It will be done as per the statute and DGMS guidelines.
XX	The mined out land should be used for agriculture purpose.	Shall be complied.
XXI	Safety measures and health issues need to be addressed for workers and surrounding villagers.	Shall be complied.
22	Proponent shall implement all the related safety	It will be done as per the statute and

	measures with safety equipment	guidelines of DGMS.
23	At the time of establishing the CHP, it is proposed to establish mist spray arrangements and also enclosing the ground level bunkers up to the level of gantry.	Shall be complied.
24	An afforestation plan to be prepared for implementation after stabilization of subsidence.	Shall be complied.
25	Water spraying arrangements at loading points and mist spray arrangements are to be provided.	Shall be complied.
26	No additional land, manpower and equipment and water shall be used for the expansion project.	Shall be complied.
27	Mine closure activity include sealing of incline mouth, dismantling of haulage system, cleaning and afforestation of coal stock area, plantation on barren land and old abandoned mine.	Mine closure plan will be formulated as per the guidelines of Ministry of Coal Gol.
28	3-tier plantation should be developed 2 Km stretch of road from the mine using native species.	Shall be complied.
29	Garland drains around the safety area such as mine shaft and low lying areas and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper setting of silt material.	It will be done as per EMP.
30	Water sprinkling system shall be provided to check fugitive emissions from loading operations, conveyor system, haulage roads, transfer points etc. Major approach roads shall be black topped and properly maintained.	Shall be complied.
31	A progressive afforestation plan shall be prepared and implemented over the mine lease area acquired and shall include areas under green belt development, areas along roads, infrastructure, along ML boundary and township etc. by planting native species in consultation with the local FDO / agriculture department.	Shall be done. EMP and mine closure plan will be followed.
32	Regular monitoring of ground water level and quality shall be carried out by establishing a	It will be complied. At present CMPDI is working to establish a network of

	network of existing wells and construction of new piezometers. The monitoring for quality shall be done four times a year, in May, August, November and January seasons and for quality in May.	piezometer well.
33	Acid water Treatment Plant, volume of water to be treated and disposal of brine should be provided.	Shall be provided if acid water treatment is required.
34	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	Shall be provided.
35	Monitoring of drinking water should be carried out regularly.	Environmental parameters are being monitored by CMPDI, as per the MoEFCC standards.
36	Sewage treatment plant shall be installed in the township. ETP shall also be provided for workshop and CHP effluents.	Shall be provided.
37	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 till the end of the mine life shall be prepared once in 3 years (for any particular season which is consistent in the time series), and the report submitted to MoEF& CC and its regional Office at Bangalore.	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 and is being uploaded on the official website of company. Further CMPDI has been requested to prepare time series of land use maps based on satellite imagery of the core zone and buffer zone in the scale 1 : 5000.
38	If the water quality parameter such as F, pH, heavy metals etc. exceed the prescribed limits, suitable measures by the proponent be taken to ensure that the local communities are provided alternate source of water for their livelihood.	Shall be done.
39	Medical camps should be organized in the area for regular checkup of workers / villagers / population. Detailed prevalent disease pattern in the area should be documented and detail of medical facilities provided for the same be made available to the MoEF&CC .	It is being done.
40	Mine discharge water outside the ML shall be monitored, particularly for TDS and treated to confirm to prescribed levels before discharge into the natural environment.	Environmental parameters are being monitored by CMPDI, as per the MoEFCC standards.
41	The Company shall put up artificial groundwater	It will be provided and regular monitoring

	recharge measures for augmentation of groundwater resource, in case water table shows a decline trend, the project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	shall be done.
42	Besides carrying out regular periodic health checkup of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health checkup for occupational diseases and hearing impairment, if any, through an agency such as NIOH, Ahmadabad within a period of one year and the results reported to this ministry and to DGMS.	It will be complied, however, BCCL has engaged NIOH for other cluster of BCCL to health checkup for occupational diseases and hearing impairment and work will be started shortly.
43	The mining in the existing mines should be phased out after expiry of the current mining lease and after reclamation of mined out area. The operating mines may be analysed and monitored for compliance of conditions, bearing with movement of wildlife and until such time they are closed / phased out.	Agreed, and shall be complied.
44	Project specific CSR for an amount of Rs 5 per tonne of coal production, as per the annual inflation, should be provided for the CSR activities undertaken and the progress made thereon shall be uploaded annually on the company website. Monitoring of the impact of activities under CSR shall be carried out periodically.	It will be done as per the CSR policy of organization.
45	A final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment, Forest & Climate Change, 5 years in advance of final mine closure for approval.	Shall be complied.
	Corporate Environment Responsibility : a) The company shall have a well laid down Environment policy approved by the Board of Directors. b) The Environment Policy shall prescribe for standard operating procedures to bring into focus any infringement / deviation / violation of the	Bharat Coking Coal Ltd is a subsidiary of Coal India Ltd which is having a well laid down Environmental Policy. It is being complied.

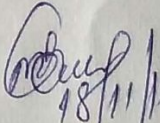
	<p>environmental or forest norms / conditions.</p> <p>c) The hierarchical system or Administrative order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.</p> <p>d) To have proper checks and balances, the company shall have a well laid down system of reporting of non – compliance / violations of environmental norms to the Board of Directors of the company and/or shareholders at large.</p>	<p>It already exists within the company.</p> <p>It will be done, if any.</p>
	B. General Conditions :	
1	No change in mining technology and scope of working shall be made without prior approval of the MoEFCC.	Shall be complied.
2	No change in the calendar plan of production for quantum of mineral / coal shall be made.	Shall be complied. However, production and calendar plan may vary due to land acquisition problem.
3	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM 10, 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.	Shall be complied.
4	Data on ambient air quality (PM10, PM2.5, 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 once in six months. Random verification of samples through analysis from independent laboratory recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	Shall be complied.
5	Adequate measures shall be taken for control of	Shall be complied.

	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 plug / muffs.	
6	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to confirm to the standards prescribed under GSR 422 (E) dated 19 th May 1993 and 31 st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	Shall be complied.
7	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	Shall be complied.
8	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.	Environmental parameters are being monitored as per NAAQS standards which is having CSIR laboratory. Monitoring stations have been finalized with Jharkhand State Pollution Control Board, Ranchi.
9	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.	Shall be complied.
10	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 should be addressed by the company while outsourcing.	Shall be complied.
11	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a senior executive, who will report 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 has been established in the headquarters. They are trained in ecological restoration, sustainable development, rainwater harvesting methods, etc.

12	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 concerned regional office.	Shall be complied.
13	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 is available with the State Pollution Control Board and may also be seen at the website of the ministry of Environment & forest.	It is complied.
14	A copy of the environmental clearance shall be marked to concerned panchayat / zilla parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestion / representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on the company's website.	It is complied.
15	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 for 30 days.	It is complied.
16	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance condition shall also be uploaded by the project authorities on their website and updated once at least in every six months so as to bring the same in public domain. The monitoring data of environmental parameter (air, water, noise and soil) and critical pollutants such as PM10, PM2.5, SO2 and NOx (ambient) and critical sector parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.	It is complied. The monitoring data of environmental parameters to be displayed at project premises shall be complied once the project starts.

17	The project proponent shall submit six monthly compliance report on status of compliance of the stipulated environmental clearance conditions (both in hard copy and email) to the respective regional office of the ministry, respective zonal office of CPCB and the SPCB.	It is being complied.
18	The regional office of this ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities shall extend full co-operation to the office(s) of the regional office by furnishing the requisite data / information / monitoring report.	It is being complied.
19	The Environment Statement for each financial year ending 31 st 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 email.	It is being complied.
C. Other Conditions by MoEF :		
4	The proponent shall abide by all the commitments and recommendations made in the EIA / EMP reports so also during their presentation to the EAC.	Agreed.
5	The commitment made by the proponent to the issue raised during Public Hearing shall be implemented by the proponent.	Shall be implemented.
6	The proponent is required to obtain all necessary clearances / approvals that may be required before the start of the project. The ministry or any other competent authority may stipulate any further condition for environmental protection.	Agreed.
7	The ministry or any other competent authority may stipulate any further condition for environmental protection.	Agreed.
8	The proponent shall set up an Environment Audit cell with responsibility and accountability to ensure implementation of all the EC conditions.	It will be done.

9	Concealing factual data or submission of false / fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Agreed.
10	The above conditions will be enforced inter-alia, under the provisions of 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 ground water and surface water, and occupational and other disease due to the mining operations.	Shall be complied.
11	Any Appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Agreed.


18/11/16

Project Officer

Kapuria Project

BCCL

STRICTLY RESTRICTED
FOR COMPANY USE ONLY RESTRICTED

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

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

(FOR THE Q.E. JUNE, 2016)

E. C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.

September, 2016



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CLUSTER - XII
(FOR THE Q.E. JUNE, 2016)

CONTENTS

SL. NO.	CHAPTER	PARTICULARS	PAGE NO.
1.		EXECUTIVE SUMMARY	1
2.	CHAPTER - I	INTRODUCTION	2-3
3.	CHAPTER-II	WATER SAMPLING & ANALYSIS	4-6
4.	Plate: Plate NO. - I	SURFACE PLAN SHOWING WATER MONITORING LOCATIONS	7

STRICTLY RESTRICTED

FOR COMPANY USE ONLY RESTRICTED

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

**ENVIRONMENTAL MONITORING REPORT
OF
BHARAT COKING COAL LIMITED
CLUSTER – XII**

(FOR THE Q.E. JUNE, 2016)

E. C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.

September, 2016



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 MoEF&CC 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 Water sampling stations

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

3.0 Methodology of sampling and analysis

3.1 Water quality

Water samples were collected as per standard practice. 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 analysed at the Environmental Laboratory at CMPDI (HQ), Ranchi.

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.

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 guidelines stipulated by Ministry of Environment, Forests and Climate Change (MoEF&CC), Govt. of India.

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

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

Bharat Coking Coal has awarded Environmental Monitoring work of all Projects, Cluster wise, to Central Mine Planning & Design Institute Limited (CMPDIL). The environmental monitoring has been carried out as per conditions laid down by MoEF&CC 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 XII is in the Central part of the Jharia coalfield. It includes Kapuria UG Mine. The cluster – XII is situated about 30 - 35 kms from Dhanbad Railway Station. The mines of this cluster - XII 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 Katri River.
- 1.2 The cluster XII is designed to produce 2.4 Mtpa (normative) and 3.12 Mtpa peak capacity of coal. The average grade of coal W-II to W-IV.

The Project has Environmental Clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC) for a rated capacity of 2.4 MTPA (normative) and 3.12 MTPA peak capacity of coal production vide letter no **E.C. no. J-11015/184/2012-IA.II (M) dated 10.12.2014.**

Ministry of Environment, Forests 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 should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.” And other conditions regarding water / effluent and noise level monitoring.

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

.....

CHAPTER – II

WATER QUALITY MONITORING

2.1 Location of sampling sites

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

- i) Drinking water quality at **Kapuria (DW12)**
- ii) Surface water quality at **U/S of Katri River (SW27)**
- iii) Surface water quality at **D/S of Katri River (SW28)**

2.2 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. The drinking and Surface water samples were collected and thereafter the samples were preserved and analyzed for 25 and 17 parameters respectively, on quarterly basis at the Environmental Laboratory at CMPDI (HQ), Ranchi.

2.3 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

(SURFACE WATER- ALL PARAMETERS)

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

Coal Limited

Name of the Cluster : **Cluster - XII**

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

Area : Kapuria

Project: Kapuria

Cluster XII

Stations:

1. Upstream in Katri River SW-27
2. Downstream in Katri River SW-28

Date of Sampling:

06/06/2016

06/06/2016

Sl. No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		SW-27	SW-28	3	4		
1	Arsenic (as As), mg/l, Max	<0.002	<0.002			0.002	IS 3025/37:1988 R : 2003, AAS-VGA
2	BOD (3 days 27°C), mg/l, Max	2.6	2.8			2.00	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
3	Colour (Hazen Unit)	colourless	colourless			Qualitative	Physical/Qualitative
4	Chlorides (as Cl), mg/l, Max	40	58			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	Dissolved Oxygen, min.	4.9	4.3			0.10	IS 3025/38:1989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	1.01	1.17			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	2.66	4.46			0.50	APHA, 22 nd Edition, UV-Spectrophotometric
12	pH value	8.36	8.08			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	260	270			2.00	APHA, 22 nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	628	662			25.00	IS 3025 /16:1984 R : 2006, Gravimetric
17	Zinc (as Zn), mg/l, Max	0.02	0.04			0.01	IS 3025 /49 : 1994, R : 2009, AAS-Flame

1. 27/5/16
2. 16/6/16
Analysed By


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

*All values is mg/lit unless specified otherwise

WATER QUALITY

(DRINKING WATER- ALL PARAMETERS)

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

Name of the Cluster : **Cluster - XII** Period: **Q. E. June, 2016**
 Area : **Kapuria** Project: **Kapuria** Cluster **XII**

Stations:

1. Drinking Water from Bhagaband DW-12

Date of Sampling:
23/05/2016

Sl. No	Parameter	Sampling Stations			Detection Limit	IS:10500 Drinking Water Standards	Standard / Test Method
		DW-12	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	1			1	5	APHA, 22 nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	66			1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	102			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	0.76			0.02	1.0	APHA, 22 nd Edition , SPADNS
7	Free Residual Chlorine, mg/l, Min	0.03			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	4			0.5	45	APHA, 22 nd Edition, UV-Spectrophotometric
12	Odour	Agreeable			Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	7.48			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 Autipyrine
15	Selenium (as Se), mg/l, Max	<0.002			0.002	0.01	APHA, 22 nd Edition, AAS-GTA
16	Sulphate (as SO ₄) mg/l, Max	136			2.00	200	APHA, 22 nd Edition. Turbidity
17	Taste	Acceptable			Qualitative	Acceptable	APHA, 22 nd Edition. Taste
18	Total Alkalinity (CaCO ₃), mg/l, Max	412			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	740			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (CaCO ₃), mg/l, Max	368			4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	3			1.0	1	IS-3025/10:1984 R-1996, Nephelometric
24	Zinc (as Zn), mg/l, Max	0.43			0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

1. 21/5/16
2. 26/5/16
Analysed By

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

*All values is mg/lit unless specified otherwise

Water Sampling Locations in BCCL

INDEX

Cluster	Surface Water (U/S, D/S)	Name of River/Na. / Jore	Mineral 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	Jogdih Village
IV	SW8, SW11, SW9, SW10	Kan 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 Basunia UGP	GW6	Bansjora Borewell
VII	SW16, SW17	Kari Jore	MW7	Dhansar UGP	GW7	Humladih
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	Showrah North	GW10	Showrah South
XI	SW23, SW24, SW25, SW26	Kan River, Damodar River	MW11	Bhagaband In UGP	GW11	Bhagabandh
XII	SW27, SW28	Kan River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Muridih (2021)	GW13	Muridih
XIV	SW31, SW32	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW35, SW32	Khudia Nala	MW15	Kharkharree UGP	GW15	Kharkharree
XVI	SW33, SW33	Khudia River	MW16	Dahibari OCP	GW16	Pallabari Village
XVII	SW35, SW35	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria

