भारत कोकिंग कोल लिमिटेड
(कोल इण्डिया लिमिटेड का एक अंग)
ऐक मिनीरतन कम्पनी
क्षेत्र त. – 7

Bharat Coking Coal Limited
(A Subsidiary of Coal India Limited)
A Miniratna Company
P.B. Area No. VII
OFFICE OF THE GENERAL MANAGER
P.O. – Kusunda, Dhanbad. Pin-828116
CIN : U10101JH1972GOI000918

By Speed Post

Ref. No.: BCCL/PBA/G.M/2018-19/ 142 Date: - 03-07-2018

To,
The Director
Ministry of Environment & forest and Climate Change
Regional Office (ECZ), Bungalow No. A-2
Shyamali Colony, Ranchi- 834002

Subject: - Six Monthly EC Compliance report for the period from October' 2017 to March' 2018 in respect of Cluster VII group of Mines.

Ref No.: **J-11015/238/2010-1A. II (M) dated 06.02.2013**

Dear Sir,

Kindly, find enclosed herewith six monthly EC Compliance report for the period from October' 2017 to March' 2018 in respect of Cluster VII group of mines.

Thanking You,

Encl: As above

Yours sincerely,

General Manager
P.B. Area

General Manager
Pootkee Balihari Area
Bharat Coking Coal Ltd

Copy to: -

1. The Director, 1A Monitoring Cell, Paryavaran Bhawan, CGO Complex, New Delhi - 110003 (By Speed Post)
2. Chairman, Jharkhand State Pollution Control Board, T.A. Division Building (Ground Floor), H.E.C. Dhruva, Ranchi – 834004 (By Speed Post)
3. Add. General Manager, Kusunda Area
4. HOD (Environment), BCCL Koyla Bhawan.
5. Project Officer (Burragarh, hurriladih)

COMPLIANCE OF EC CONDITIONS OF CLUSTER-VII

(October '17 to March '18)

Sl. no.	A. Specific Conditions by MOEF:	Compliance
i	**The maximum production shall not exceed beyond that for which environmental clearance has been granted.**	The approved normative production and peak of cluster VII is **6.22 MTPA & 8.16 MTPA** respectively. The total production of the mines of Cluster-VII is **1.728 MT** in the F.Y **2017-'18 which is well within the limit.**
ii	**The measure identified in the environmental plan for cluster VII groups of mine and the conditions given in this environmental clearance letter shall be dovetailed to the implementation of the Jharia Action Plan.**	Master Plan activities are dovetailed with compliance of environmental clearance conditions. The master plan deals with fire control and rehabilitation activities of fire affected areas in the leasehold of BCCL. By implementing digging out of total fiery seam as fire control measures air pollution and emission of Green House Gases (GHGs) from the fire affected areas are being prevented. Further rehabilitation of the families from the fire endangered area to the safe places have been taken-up with the help of State Govt. of Jharkhand. The Master plan is being implemented for BCCL as per the prioritization of fire and rehabilitation activities in approved Master Plan. The brief status of Rehabilitation and Fire control measures are enclosed. **ANNEXURE A**
iii	**The proponent shall prepare time -series maps of the Jharia Coalfields through NRSA to monitor and prevent fire problems in the Jharia Coalfields by Isothermal mapping /imaging and monitoring temperatures of the coal seams (whether they are close to spontaneous ignition temperatures) and based on which, areas with potential fire problems shall be identified.** **Measures to prevent ingress of air (Ventilation) in such areas, to prevent restart fresh/spread fires in other areas including in mines of cluster VII shall be undertaken.**	NRSC has conducted survey of fires of Jharia coalfield by remote sensing methods using thermal infra-red data and land subsidence mapping of Jharia coalfield using Inter-ferometic SAR data. Total fire affected area in Jharia Coalfield has been reduced from 9.0 sq.km to 2.18 sq.km. This could be achieved only due to the successful "excavation method i.e. digging out of fiery coal" adopted by BCCL. Action is being taken as specified in EC and as per Jharia Master Plan. Further at Kusunda OC, fire patch is being dug out for the purpose of dealing with fire and combustible materials are extracted out to save the coal from burning and to stop further spread of the fire. Once the fiery coal is dug-out/excavated there will be no more chance of re-starting of fresh/ spreading of fire into other areas. At Alkusa Colliery, after taking adequate measures in ug as per CMR,57 and DGMS guidelines, mine entrances (3 pit) have been filled and (6 & 7 pit) sealed to stop ingress of air/spread of UG fire.
iv	**Underground mining should be taken up after completion of reclamation of Opencast mine area after 13 years.**	It shall be complied.

v	**No mining shall be undertaken where underground fires continue. Measure shall be taken to prevent/ check such fire including in old OB dump areas where the fire could start due to presence of coal /shale with sufficient carbon content.**	It shall be complied. Action is being taken to control, mine fires as specified in Jharia Master Plan and the mining is being done as per the guidelines and permissions of Directorate General of Mines Safety (DGMS).
vi	**The rejects of washeries in Cluster –VII should be send to FBC based plant.**	Coal washery does not exist in this Area.
vii	**There shall be no external OB dumps. OB produce from the whole cluster will be 378.86 Mm3. OB from 5 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.**	It shall be complied. Action is being taken as specified in EMP. Backfilling of OB is going on concurrent with mining and at the end of mining activity the area will be re-vegetated and reclaimed as per EMP.
viii	**A detailed calendar plan of production with plan for OB dumping and backfilling (for OC mines) and reclamation and final mine closure plan for each mine of cluster-VII shall be drawn up and implemented.**	Calendar plan has been prepared and enclosed **(ANNEXURE A).** Mine closure plan as per the guidelines of Ministry of Coal has been prepared by Regional Institute –II, Central Mine planning and Design Institute, Dhanbad. MCP is being implemented in mines.
ix	**The void shall be converted into a water reservoir of a maximum depth of 15-20 m and shall be gently sloped and the upper benches of the reservoir shall be stabilized with plantation and the periphery of the reservoir fenced. The abandoned pits and voids should be backfilled with OB and biologically reclaimed with plantation and or may be used for pisciculture**	It shall be complied. A part of the void will be converted into the water body, if safety permit with prior permission from DGMS.
x	**Mining shall be carried out as per statuette from the streams/nalas flowing within the lease and maintaining a safe distance from the Nalas flowing along the lease boundary. A safety barrier of a minimum 60m width shall be maintained along the nalas/water bodies. The small water bodies in OC shall be protected to the extent feasible and the embankment proposed along water body shall be strengthened with stone pitching.**	It is being followed. Embankments have been constructed as specified in EC
xi	**Active OB dumps near water bodies and rivers should be rehandled for backfilling abandoned mine voids. However, those which have been biologically reclaimed need not be disturbed.**	No OB is being dumped near water bodies.

xii	**Thick green belt shall be developed along undisturbed areas, mine boundary and in mine reclamation. During post mining stage, a total of 794.09 ha area would be reclaimed. The total additional area under plantation would be 1165.67 ha (90.78 ha abandoned quarry area, 516 ha active quarry area, 27.31 OB dump outside quarry area, 38.55 ha service building /mine infrastructure area /coal dump etc, 395 ha green belt around OCP, 98.5 ha barren area), by planting 2914150 plants at a total cost of Rs 642.20 lakhs.**	It shall be complied. Plantation at degraded area and avenue plantation is already being executed for development of green belts as per EC. At degraded OB dump sites at decoaled zone, eco-restoration work is in successful progress. Details of plantation done and programme of eco-restoration. Enclosed as **ANNEXURE B**
xiii	**The road should be provided with avenue plantation on both side as trees act as sink of carbon and other pollutant**	It shall be complied.
xiv	**Specific mitigative measures identified for the Jharia Coalfields in the Environmental Action Plan prepared for Dhanbad as a critically polluted area and relevant for Cluster VII shall be implemented.**	Dhanbad Action Plan has been prepared for entire BCCL and not cluster wise. It is being implemented comprehensively for all the mines of BCCL. Some of the salient actions is enclosed as **ANNEXURE C.**
xv	**The locations of monitoring stations in the Jharia Coalfields should be finalized in consultation with the Jharkhand State Pollution Control Board. The Committee stated that smoke/dust emission vary from source to source (fuel wood, coal, fly ash from TPPs, silica from natural dust, etc) and a Source Apportionment Study should be got carried out for the entire Jharia Coalfields. Mineralogical composition study should be undertaken on the composition of the suspended particulate matter (PM_{10} and $PM_{2.5}$) in Jharia Coalfields and also quantified. These studies would help ascertain source and extent of the air pollution, based on which appropriate mitigative measures could be taken.**	Establishment of ambient environment quality monitoring stations has been done. At present this environment monitoring work is being dealt by CMPDI. Enclosed as **ANNEXURE D**
xvi	**No groundwater shall be used for the mining activities. Additional water required, if any, shall be met from mine water or by recycling/reuse of the water from the existing activities and from rainwater harvesting measures.** **The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry to dewatering of mine**	No ground water is being utilized for the purpose of industrial use of the water. Mine water has been channelized through pipelines and through delivery in to the old quarry for its community use & industrial use. Drinking water is being purchased from the Mineral Area Development Authority (MADA). Further for the utilization of mine water following actions has been taken by the company 1. **Installation of Pressure filters:** In Kusunda Area, three Pressure Filters, two Slow Sand Filter and two Rapid Gravity Filter Plant are there. At East Bassuriya New Colony, installation of two nos. Pressure Filters is under process. At Alkusa

		installation of two nos. of Pressure Filters are under proposal. 2. **Rain water Harvesting:** to catch run-off water in colonies, proposal for rain water harvesting at two colonies in Kusunda Area is under process from Civil Deptt.
xvii	**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 piezometers. The monitoring for quantity shall be dome four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality including Arsenic and Fluoride during the month of May. Data thus collected shall be submitted to the Ministry of Environment & Forest and to the Central Pollution Control Board/SPCB quarterly within one month of monitoring. Rainwater harvesting measures shall be undertaken in case monitoring of water table indicates a declining trend.**	The work of monitoring of ground water level is being done by CMPDI.
xviii	**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.**	The work of monitoring of mine discharge water has been done by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad having CSIR laboratory recognized under the EP Rules. At present the monitoring work is being done by CMPDI. Mine discharge water is filtered in filter plants installed in different collieries for domestic use.
xix	**ETP shall also be provided for workshop, and CHP, if any. Effluents shall be treated to confirm to prescribed standards in case discharge into the natural water course**	Proposal for construction of Oil Grease Trap is under process.
xx	**Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, structure, roads, and surroundings shall be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil/suitable material.**	At present no underground workings is in operation (except pumping mine water). However regular monitoring of subsidence will be undertaken on operating depillaring districts.
xxi	**Sufficient coal pillars shall be left unextracted around the air shaft (within the subsidence influence area) to protect from any damage from subsidence, if any.**	Sufficient coal pillars have been left around air shafts as per the statutes and DGMS guidelines.
xxii	**High root density tree species shall be selected and planted over areas likely to be affected by**	It will be complied, if required

	subsidence	
xxiii	**Depression due to subsidence resulting in water accumulating within the low lying areas shall be filled up or drained out by cutting drains.**	It will be complied, if required.
xxiv	**Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.**	It has been followed. Sufficient barriers are left for saving the surface installation and infra structures as per the statute and DGMS guidelines.
xxv	**No depillaring operation shall be carried out below the township/colony.**	Complied.
xxvi	**The Transportation Plan for conveyor-cum–rail for Cluster-VII should be dovetailed with Jharia Action Plan. The Plan for conveyor-cum–rail for Cluster-VII should be dovetailed with Jharia Action Plan. The road transpiration of coal during phase–I should be by mechanically covered trucks.**	CMPDIL, RI-II has been requested to conduct study and prepare the plan in this regard. Conversion of existing truck in to mechanically covered trucks is under proposal. By that time transportation is being done by covering vehicle with tarpaulin cover.
xxvii	**A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport**	CMPDI RI-2 has been requested for Source Apportionment Study.
xxviii	**R&R of 13605 nos of PAF's involved. They should be rehabilitated at cost of Rs 529.47Crores as per the approved Jharia Action Plan.**	Rehabilitation of PAF is taken up as per the approved Master Plan. JRDA is doing the work.
xxix	**A detailed CSR Action Plan shall be prepared for Cluster VII croup of mines. Specific activities shall be identified for CSR the budget of Rs. 311.35 Lakhs per year@ Rs 5/T of coal as recurring expenditure. The 143 ha of area within Cluster VII ML existing as waste land and not being acquired shall be put to productive use under CSR and developed with fruit bearing and other useful species for the local communities. In addition to afforesting 794.09 ha of are at the post-mining stage, 135.5 ha waste land /barren land within Cluster VII ML shall be rehabilitated/reclaimed as forest/agricultural land under CSR Plan in consultation with local communities. Third party evaluation shall be got carried out regularly for the proper implementation of activities undertaken in the project area under CSR. Issue raised in the Public Hearing shall also be integrated with activities being taken up under CSR. The details of CSR undertaken along with budgetary provisions for the village-wise various activities and expenditure thereon shall be uploaded on the company website every year. The company must give priority to capacity building both within the company and to the local youth, who are motivated to carry out the work in future.**	CSR activities are being taken up on priority basis. Enclosed as **ANNEXURE F.**

xxx	**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.**	Presently a time series map of vegetation cover in the Jharia Coal Field is being carried out through CMPDI Ranchi using satellite imagery for every 3 years. CMPDI has been prepared "Time series of land use maps based on satellite imagery of the core zone and buffer zone.
xxxi	**A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests five year before mine closure for approval. Habitat Restoration Plan of the mine area shall be carried out using a mix of native species found in the original ecosystem, which were conserved in-situ and ex-situ in an identified area within the lease for reintroduction in the mine during mine reclamation and at the post mining stage for habitat restoration.**	It will be complied.
xxxi i	**A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company for implementing environment policy and socio-economic issues and the capacity building required in this regard.**	A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the Area level, one Executive in each area has also been nominated as Nodal Officer (Environment) under General Manager of Area and at Project level, concerned Safety Officer under Project Officer is looking after the environment related jobs and also entrusted with the responsibility of compliance and observance of the environmental Acts/ Laws including environment protection measures. The activities are monitored on regular basis at Area and at 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 motivative under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is being done.
xxxi ii	**Implementation of final mine closure plan for Cluster VII, subject to obtaining prior approval of the DGMS in regard to mine safety issues**	Final Mine Closure Plan, as per the guideline will be submitted 5 years before the closure of the Mine. For the purpose of safety issues related to the closure prior approval of DGMS will be taken in this regard.
xxxi v	**Corporate Environment Responsibility:** **a) The Company shall have a well laid down Environment Policy approved by the Board of**	A well-defined Corporate Environment Policy has already been laid down and approved by the Board of

	Directors.	Directors. This is also posted on BCCL website. Enclosed as **ANNEXURE G.**
	b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.	Complied.
	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.	A hierarchical system of the company to deal with environmental issues from corporate level to mine level already exists.
	To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large	Being complied.
B	**General Conditions by MOEF:**	
i	**No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.**	Being followed.
ii	**No change in the calendar plan of production for quantum of mineral coal shall be made.**	Being followed. Production of the cluster is being done well within the peak production capacity as per EC.
iii	**Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM_{10}, $PM_{2.5}$, SO_2 and NOx monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.**	Monitoring stations are established in consultation with SPCB, Dhanbad. Enclosed as **ANNEXURE D**
iv	**Data on ambient air quality (PM_{10}, $PM_{2.5}$, 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 recognised under the EPA rules, 1986 shall be furnished as part of compliance report.**	The work of monitoring of ambient environment has been done by CMPDI, Dhanbad having CSIR laboratory recognized under the EP Rules.

v	**Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.**	Being Complied.
vi	**Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.**	Proposal for construction of oil & grease trap arrangement at w/shop is under process.
vii	**Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.**	Being 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 analyzed through a laboratory recognized under EPA Rules, 1986.**	The work of monitoring of ambient environment has been done by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad having CSIR laboratory recognized under the EP Rules. At present CMPDI is doing the work.
ix	**Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.**	Being Complied. A separate full-fledged Human Resource Development Deptt. Is conducting regular training programme on these issues. Apart from this Group Vocational Training Centers is there in the Area which provides periodical training on the safety and occupational health issue to each of the workers working in the mines.
x	**Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed 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 of the Area is carried out at Bhuli PME Centre, Bhuli, Dhanbad as per the Statutes and guidelines of Director General of Mines Safety (DGMS). Enclosed as **ANNEXURE H.**
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. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the Area level, one Executive in each area has also been nominated as Nodal Officer (Environment) under General Manager of Area and at Project level, concerned Safety Officer under Project Officer is looking after the environment related jobs and also

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

4-7-18

Add. General Manager
Kusunda Area

Add. General Manager
B.C.C.L.
Kusunda Area

4-7-18

Project Officer
Burragarh & Hurriladih

Project Officer
BURRAGARH COLLIERY

ANNEXURE-A

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

2. **OB BACKFILLING PROGRAMME**

Backfilling Programme: (in Mm^3)

Year	Dhansar/Vishwa -karma OC	Ena OC	Kusunda OC	Total
2018-19	1.0	1.55	1.5	4.05
2019-20	1.5	1.55	1.5	4.55
2020-21	2.0	1.80	1.5	5.3

STATUS OF JHARIA MASTER PLAN DOVETAILED WITH ENVIRONMENT CLEARANCE CONDITIONS

Rehabilitation and Fire control measures

Socio-economic Survey:

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

Accommodation provided in Satellite Township:

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

Status of fire dealing:

Under Master Plan, many Fire schemes have been formulated / prepared /implemented for dealing fires sites spread in collieries of BCCL. Further for expediting the fire dealing

process, excavation methods have been resorted to by deploying Hired HEMM at various mines of BCCL. Total digging out of fiery coal has been adopted for dealing of fire.
In fire patch of V/VI/VII/VIII seam of Gareria Secn. at East Bassuriya, about 1,70,000 cu.m. mitti and non-combustible material has been filled, rest will be filled by quarry OB.

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

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

ANNEXURE-B

- Plantation- 500 no. bamboo-gabion plantation have been done. At the side of rly. siding plantation work is being going on. At GKKC Eco-Restoration site plantation done and area undertaken has been mentioned below:

Site name	Area in Ha.	No. of Saplings planted
Site 1 (old site)	About 2.0	6374, grass grown up
Site 2	About 1.79	1815, grass grown up & more grass seeds spreaded
Site 3	About 3.0	1025 & grass seeds spreaded

PLANTATION/ECOLOGICAL-RESTORATION PROGRAMME

Plantation/Ecological Restoration Programme under Cluster VII

YEAR	CLUSTER VII	No. of saplings/plants
2018-19	6.00 Ha(approx.)	20000, A site of 4.99 Ha has already been taken up for the year 2018-19
2019-20	6.00 Ha(approx.)	15000
2020-21	6.00 Ha(approx.)	15000

(6) Dealing of mine fires

A Master plan for Dealing with fires and subsidence and rehabilitation in the Leasehold of BCCL has been approved by Govt. of India vide letter no- 22020/1/2005-CRC dated 12 08 09. In fire patch of V/VI/VII/VIII seam of Gareria Secn. at East Bassuriya about 1,70,000 cu.m. mitti and non-combustible material has been filled, rest will be filled by quarry OB.
In Kusunda OC and Ena OC, fire patches are being dug out for the purpose of dealing with fire and combustible materials are extracted out to save the coal from burning and to stop further spread of the fire. Once the total fiery coal is dug-out/excavated there will be no more chance of re-starting of fresh/ spreading of fire into other areas.
At Alkusa mine, measures have been taken as per CMR'57 and DGMS Guidelines to control ug fire and entrances have been filled/sealed to stop ingress of air into fire affected area.

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

-- It shall be complied

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

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

(9) Tree plantation on the dumps

Complied. 26,250 nos. saplings planted at 10.5 Ha OB dump area and 500 nos. plants as bamboo-gabion plantation done by DFO, Dhanbad. In Gondudih-Khas Kusunda Mine. Ecological restoration work in 2.0 Ha OB dump area at Gondudih are in successful progress; total 5900 plants has been planted there. At new eco-restoration site (more than 1.79 Ha OB dump- area) about 2400 plants along with seeds of grass and shrubs have been spread over during 2015-'16 successfully.

(10) All hazardous wastes shall be disposed off

Complied.

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

(11) Monitoring and Reporting six monthly

Monitoring work has been done by CIMFR, Dhanbad and at present CMPDI is doing the work.

(12) Introduction of GIS/ GPS

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

ANNEXURE-D

(7)

Ph: 0326-2204933

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

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

From,

Regional Officer,
Dhanbad

To,

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

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

Sir,

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

Encl-A/a.

Your's faithfully,

6/7/13

(Dinesh Prasad Singh)
Regional Officer.

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

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

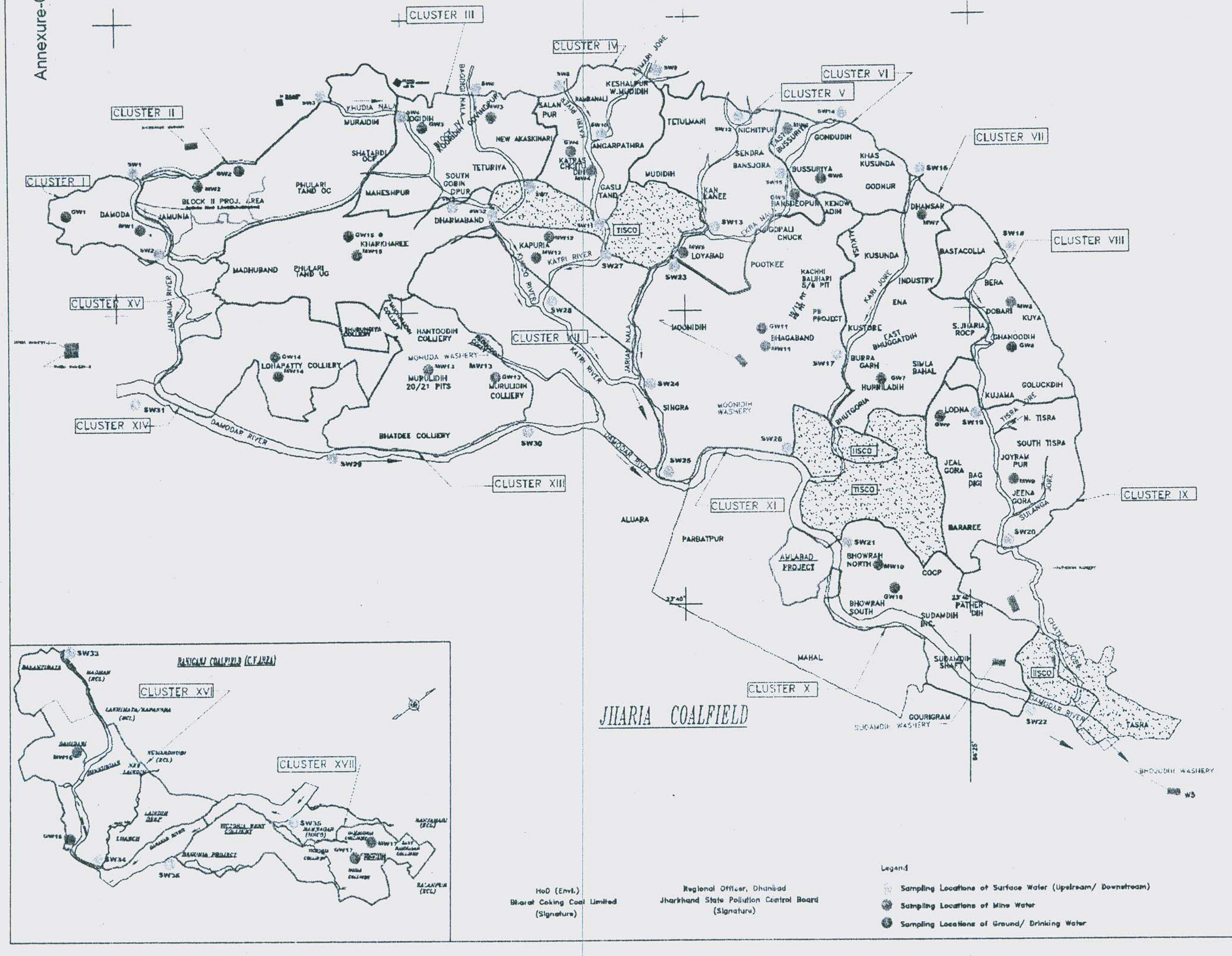
Encl-A/a.

(Dinesh Pd. Singh)
Regional Officer.

Printed by Sandip

Annexure-03

Water Sampling Locations in BCCL



INDEX

Cluster	Surface Water (US, DS)	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	Godhdpur Colliery	GW3	Jogidih Village
IV	SW8, SW11, SW9, SW10	Katri River, Kumari Jore	MW4	Chatudih	GW4	Kankanee Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudidih	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UCP	GW6	Bansjora Borewell
VII	SW16, SW17	Kari Jore	MW7	Dhansar UGP	GW7	Hurriladih
VIII	SW18, SW19	Kari Jore	MW8	Dobari UGP	GW8	Ghanudih
IX	SW19, SW20	Kari 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 UCP	GW11	Bhagabandh
XII	SW27, SW28	Katri River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Murulidih 20/21	GW13	Murlidih
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	GW15	Palasbani Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria

ANNEXURE-C

COMPLIANCE OF DHANBAD ACTION PLAN

(1) Covering of loaded transport vehicles

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

(2) Coal transport roads shall be made pucca

In 2015-16 about 80 m pucca road near Kusunda Office has been constructed.
Proposals for 2016-17 include:

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

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

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

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

(4) MOBILE SPRINLKLERS

Sl. no.	Mine	Haul road length in Km	No. of mobile sprinklers	Total Capacity(KL)	Trips per day
1	Kusunda OC + Godhur mixed	6.5-7.0	6	3-20 KL,3-12KL	50 trips/day
2	Dhansar/Industry	3.5-4.0	6	2-12KL each, 1-20KL, 3-8KL each	20 trips/day
3	Gondudih KKC	5.0-6.0	3	60	15 trips each/day,
4	Ena	1.5-2.5	1	9	4 trips /day,

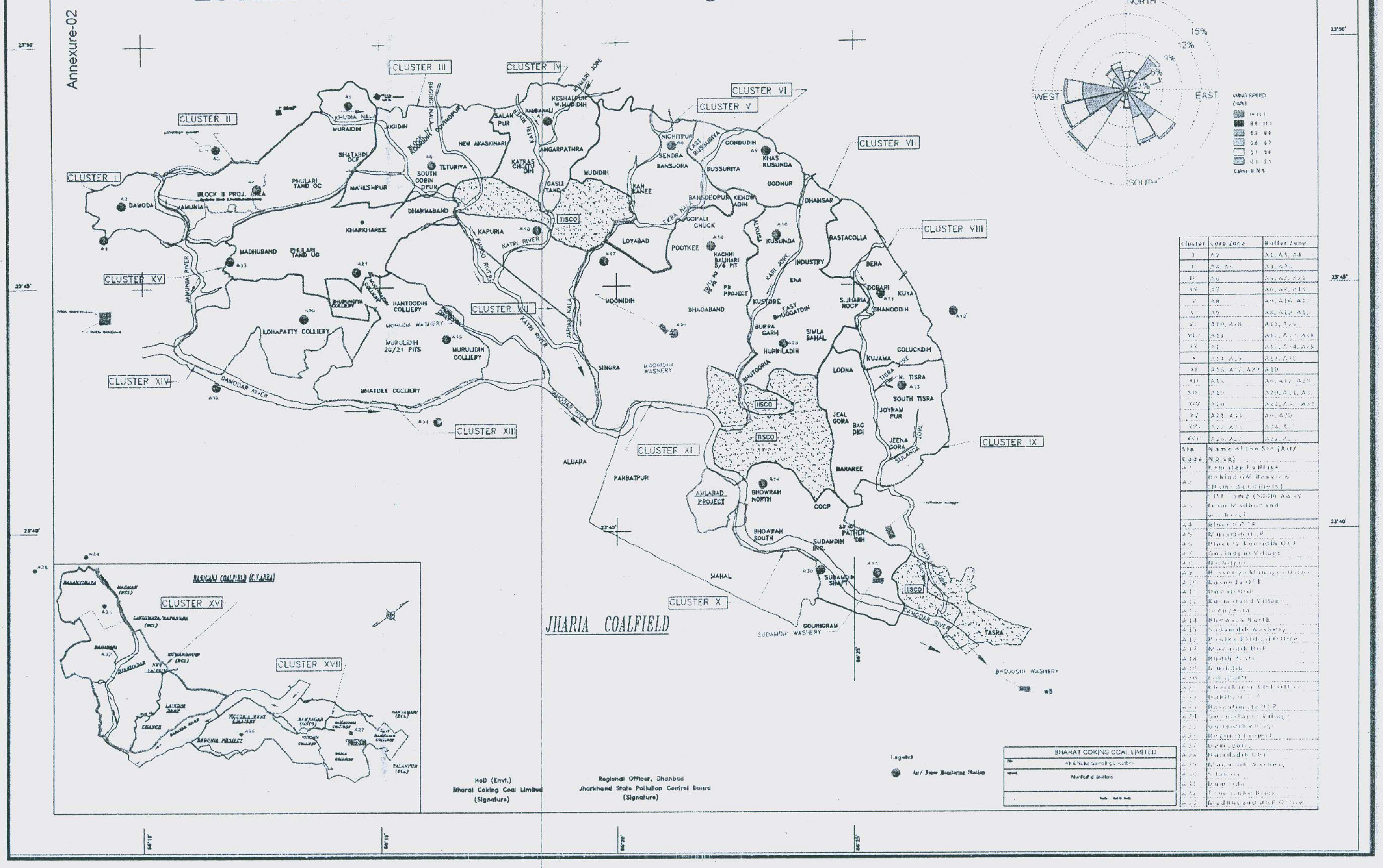
(5) The direction of surface run-off of the premises of collieries shall be diverted to created water bodies.

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

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

Annexure-02

Location of Air & Noise Monitoring Stations in BCCL



Cluster	Core Zone	Buffer Zone
I	A7	[illegible]
II	A4, A5	[illegible]
III	A6	[illegible]
IV	[illegible]	[illegible]
V	A8	[illegible]
VI	A9	[illegible]
VII	A10, A28	[illegible]
VIII	A11	[illegible]
IX	[illegible]	[illegible]
X	[illegible]	[illegible]
XI	[illegible]	A19
XII	[illegible]	[illegible]
XIII	[illegible]	[illegible]
XIV	[illegible]	[illegible]
XV	[illegible]	[illegible]
XVI	[illegible]	[illegible]
XVII	[illegible]	[illegible]

Stn Code	Name of the Stn (Air/ Noise)
A1	[illegible] Village
A2	Behind GM Bungalow [illegible]
A3	[illegible]
A4	Block II OCP
A5	Muraidih OCP
A6	[illegible]
A7	Govindpur Village
A8	Nichitpur
A9	[illegible] Manager Office
A10	Kusunda OCP
A11 – A32	[illegible]

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

(FOR THE MONTH OCTOBER, 2017)

E. C. no. J-11015/93/2009-IA.II (M) dated 06.02.2013.

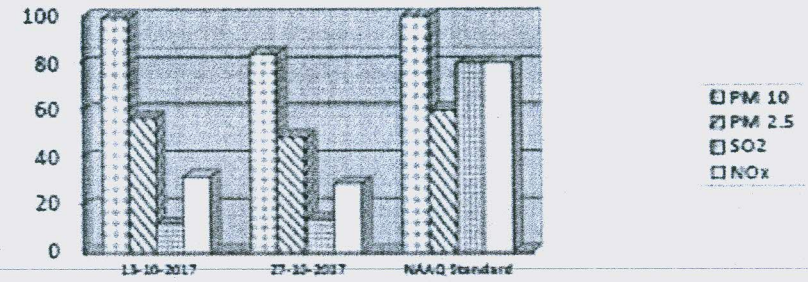
February, 2018

CMPDI
ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

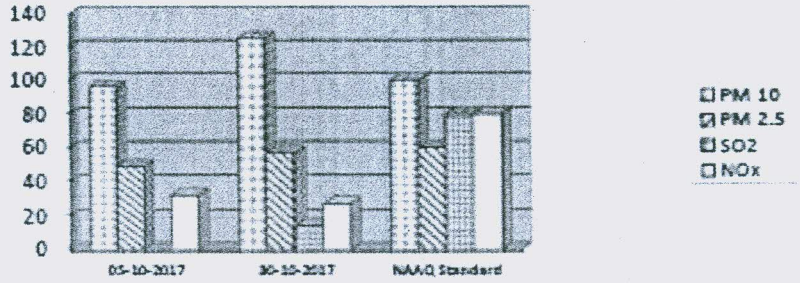
AMBIENT AIR QUALITY DATA

Cluster –VII, Bharat Coking Coal limited Month: Oct-2017 Year: 2017-18.

Station Name: Kusunda OCP (A10)		Zone: Core		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	13-10-2017	99	57	12	32
2	27-10-2017	84	49	14	29
	NAAQ Standard	100	60	80	80



Station Name: Hurriladih UGP (A28)		Zone: Core		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	05-10-2017	96	49	<10	32
2	30-10-2017	125	57	14	27
	NAAQ Standard	100	60	80	80



Analysed By

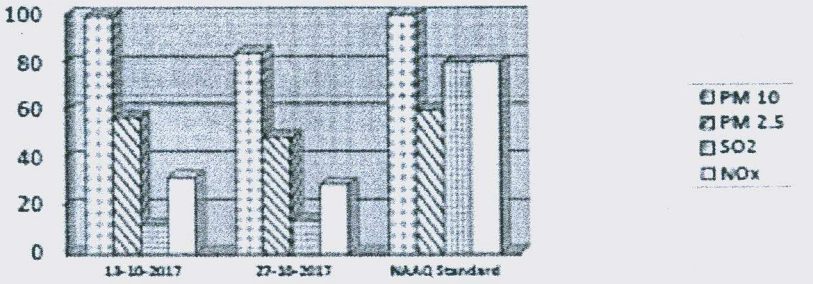
Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

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

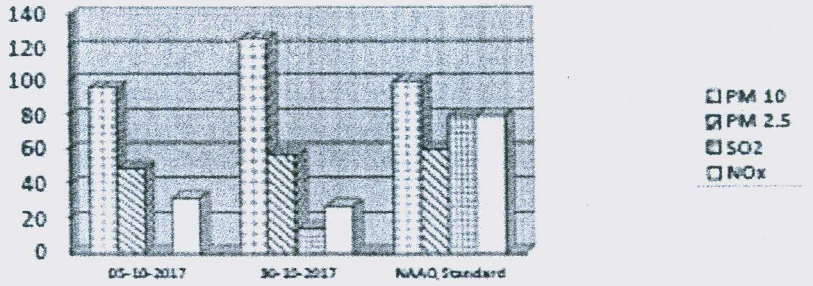
AMBIENT AIR QUALITY DATA

Cluster –VII, Bharat Coking Coal limited Month: Oct-2017 Year: 2017-18.

Station Name: Kusunda OCP (A10)		Zone: Core		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	13-10-2017	99	57	12	32
2	27-10-2017	84	49	14	29
	NAAQ Standard	100	60	80	80



Station Name: Hurriladih UGP (A28)		Zone: Core		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	05-10-2017	96	49	<10	32
2	30-10-2017	125	57	14	27
	NAAQ Standard	100	60	80	80

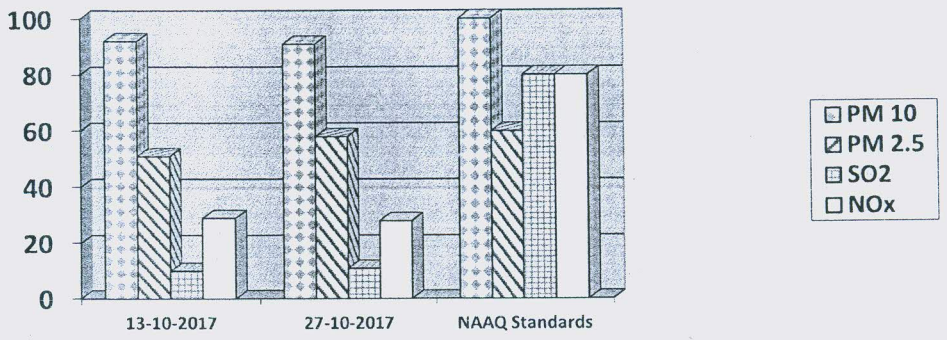


Analysed By
ANALYSTS

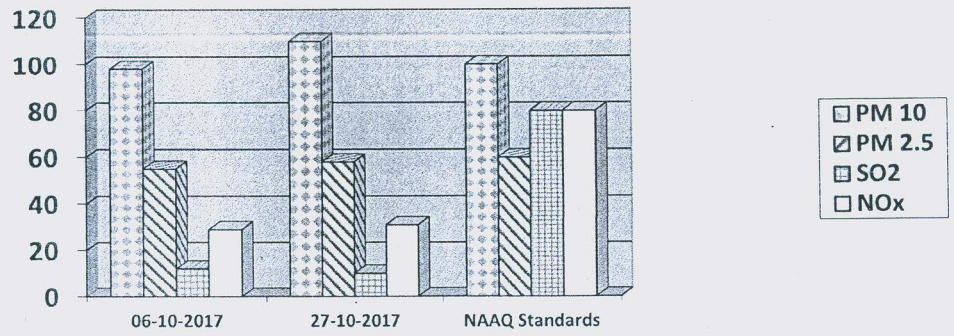
Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

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

Station Name: Dobari UGP (A11)		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	13-10-2017	92	51	<10	29
2	27-10-2017	91	58	11	28
	NAAQ Standards	100	60	80	80



Station Name: Moonidih Washery (A29)		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	06-10-2017	98	55	12	29
2	27-10-2017	110	58	10	31
	NAAQ Standards	100	60	80	80



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

Analysed By
JSA/SA/SSA

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

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

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. – II**)

i) **Mine Discharge of Dhansar UGP (MW7)**

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

3.2 Methodology of sampling and analysis

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

3.3 Results & Interpretations

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

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: **Cluster -VII**		Month: **October, 2017**	Name of the Station: **Mine Discharge of Dhansar UGP**	
Sl. No.	**Parameters**	**MW7** First Fortnight	**MW7** Second Fortnight	**As per MOEF General Standards for schedule VI**
		13.10.2017	27.10.2017	
1	Total Suspended Solids	28	16	*100 (Max)*
2	pH	6.92	6.41	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	20	28	*250 (Max)*

All values are expressed in mg/lit except pH.

Analysed By
JSA/SA/SSA

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

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

NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

i) **Kusunda OCP (N10)**
ii) **Hurriladih UGP (N28)**
iii) **Dobari UGP (N11)**
iv) **Moonidih Washery (N29)**

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

NOISE LEVEL DATA

Name of the Project: **Cluster -VII**			Month: **October, 2017**		
Sl. No.	**Station Name/Code**	**Category of area**	**Date**	**Noise level dB(A)LEQ**	***Permissible Limit of Noise level in dB(A)***
1	**Kusunda OCP (N10)**	**Industrial area**	13.10.2017	63.4	*75*
2	**Hurriladih UGP (N28)**	**Industrial area**	05.10.2017	59.4	*75*
3	**Dobari UGP (N11)**	**Industrial area**	13.10.2017	62.9	*75*
4	**Moonidih Washery (N29)**	**Industrial area**	06.10.2017	60.5	*75*
5	**Kusunda OCP (N10)**	**Industrial area**	27.10.2017	62.5	*75*
6	**Hurriladih UGP (N28)**	**Industrial area**	30.10.2017	59.8	*75*
7	**Dobari UGP (N11)**	**Industrial area**	27.10.2017	63.0	*75*
8	**Moonidih Washery (N29)**	**Industrial area**	27.10.2017	60.3	*75*

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

Analysed By
JSA/SA/SSA

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

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

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

(FOR THE MONTH NOVEMBER, 2017)

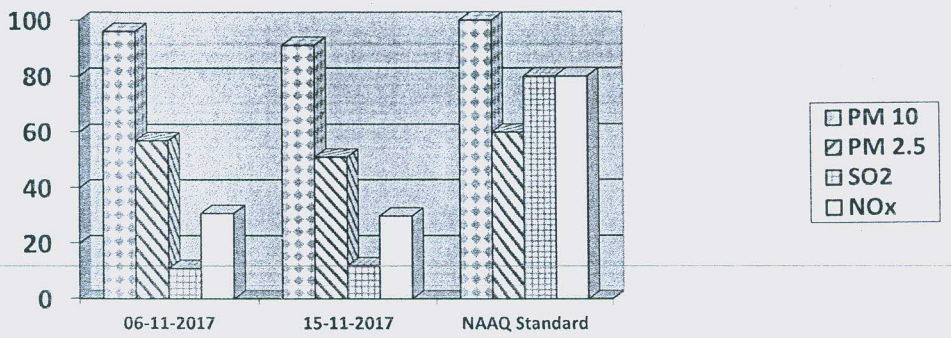
E. C. no. J-11015/93/2009-IA.II (M) dated 06.02.2013.

CMPDI
ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

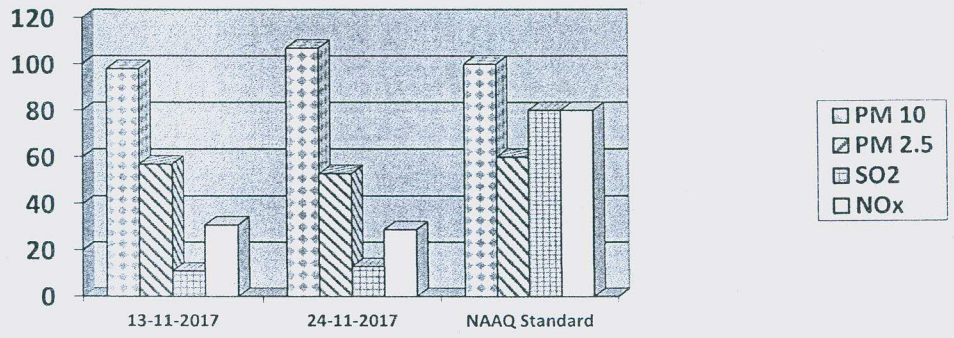
AMBIENT AIR QUALITY DATA

Cluster –VII,Bharat Coking Coal limited Month:Nov-**2017** Year:**2017-18.**

StationName: Kusunda OCP (A10)		Zone: Core		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	06-11-2017	96	57	11	31
2	15-11-2017	91	51	12	30
	NAAQ Standard	100	60	80	80



Station Name: Hurriladih UGP (A28)		Zone: Core		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	13-11-2017	98	57	11	31
2	24-11-2017	107	53	13	29
	NAAQ Standard	100	60	80	80

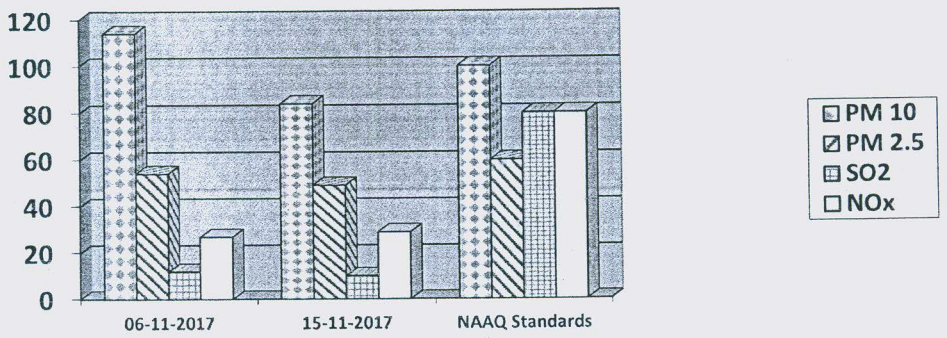


Analysed By
JSA/SA/SSA

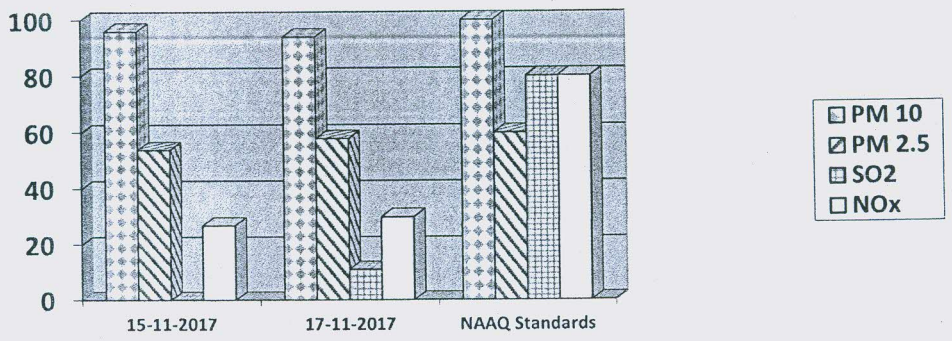
Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

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

Station Name: Dobari UGP (A11)		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	06-11-2017	114	54	12	27
2	15-11-2017	84	49	10	29
	NAAQ Standards	100	60	80	80



Station Name: Moonidih Washery (A29)		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	15-11-2017	96	54	<10	27
2	17-11-2017	94	58	11	30
	NAAQ Standards	100	60	80	80



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

Analysed By
JSA/SA/SSA

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

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

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. – II**)

i) **Mine Discharge of Dhansar UGP (MW7)**

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

3.2 Methodology of sampling and analysis

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

3.3 Results & Interpretations

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

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: **Cluster -VII**		Month: **November, 2017**	Name of the Station: **Mine Discharge of Dhansar UGP**	
Sl. No.	**Parameters**	**MW7** First Fortnight	**MW7** Second Fortnight	**As per MOEF General Standards for schedule VI**
		06-11-2017	15-11-2017	
1	Total Suspended Solids	32	24	*100 (Max)*
2	pH	6.64	7.85	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	24	28	*250 (Max)*

All values are expressed in mg/lit except pH.

Analysed By
JSA/SA/SSA

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

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

NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

i) **Kusunda OCP (N10)**
ii) **Hurriladih UGP (N28)**
iii) **Dobari UGP (N11)**
iv) **Moonidih Washery (N29)**

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

NOISE LEVEL DATA

Name of the Project: **Cluster -VII**			Month: **November, 2017**		
Sl. No.	**Station Name/Code**	**Category of area**	**Date**	**Noise level dB(A)LEQ**	***Permissible Limit of Noise level in dB(A)***
1	**Kusunda OCP (N10)**	**Industrial area**	06-11-2017	63.6	*75*
2	**Hurriladih UGP (N28)**	**Industrial area**	13-11-2017	60.2	*75*
3	**Dobari UGP (N11)**	**Industrial area**	06-11-2017	61.8	*75*
4	**Moonidih Washery (N29)**	**Industrial area**	15-11-2017	61.4	*75*
5	**Kusunda OCP (N10)**	**Industrial area**	15-11-2017	65.1	*75*
6	**Hurriladih UGP (N28)**	**Industrial area**	24-11-2017	65.1	*75*
7	**Dobari UGP (N11)**	**Industrial area**	15-11-2017	60.4	*75*
8	**Moonidih Washery (N29)**	**Industrial area**	17-11-2017	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,**

Analysed By
JSA/SA/SSA

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

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

WATER QUALITY REPORT
OF
BHARAT COKING COAL LIMITED,
CLUSTER – VII

(FOR THE Q.E. DECEMBER, 2017)

E. C. no. J-11015/238/2010-IA.II (M) dated 06.02.2013.

CMPDI
ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

WATER QUALITY

(MINE EFFLUENT- 25 PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2017-18.**

Name of the Cluster : **Cluster -VII** PERIOD: **Q. E. DECEMBER- 2017.**

Type of Sample: Mine Discharge Water Sample Name of Mine KUSUNDA OCP

Testing Protocol: As per DW Standards (IS- 10500) Date of Sampling: 14-12-17

Sl. No	Parameter	Test Result	Detection Limit	Permissible Limit	Method of Testing
1	Boron (as B), mg/l, Max	<0.20	0.02	0.5	APHA, 22nd Edition ,Carmine
2	Colour,in Hazen Units	4	1	5	APHA, 22nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	72	1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	68	2.00	250	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	0.001	0.05	IS 3025/42 : 1992 R : 2009, AAS-Flame
6	Fluoride (as F) mg/l, Max	0.32	0.02	1.0	APHA, 22nd Edition , SPADNS
7	Free Residual Chlorine, mg/l, Min	<0.02	0.02	0.2	APHA, 22nd Edition, DPD
8	Iron (as Fe), mg/l, Max	0.47	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	4.82	0.5	45	APHA, 22nd Edition, UV-Spectrphotometric
12	Odour	Agreeable	Qualitative	Agreeable	IS 3025 /05:1983, R-2012. Qualitative
13	pH value	7.73	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	112	2.00	200	APHA, 22nd Edition. Turbidity
17	Taste	Acceptable	Qualitative	Acceptable	APHA, 22nd Edition. Taste
18	Total Alkalinity (c_ac_o3),, mg/l, Max	112	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	494	25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c_ac_o3), mg/l, Max	304	4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	1.8	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	<0.01	0.005	0.02	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

NOTE:*All parameters are in mg/l except*

pH

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WATER QUALITY

(MINE EFFLUENT- 25 PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2017-18.**

Name of the Cluster : **Cluster -VII** PERIOD: **Q. E. DECEMBER- 2017.**

Type of Sample: Mine Discharge Water Sample Name of Mine ALKUSA

Testing Protocol: As per DW Standards (IS- 10500) Date of Sampling: 23-12-2017

Sl. No	Parameter	Test Result	Detection Limit	Permissible Limit	Method of Testing
1	Boron (as B), mg/l, Max	<0.2	0.02	0.5	APHA, 22nd Edition ,Carmine
2	Colour,in Hazen Units	4	1	5	APHA, 22nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	84.5	1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	36.7	2.00	250	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	0.058	0.001	0.05	IS 3025/42 : 1992 R : 2009, AAS-Flame
6	Fluoride (as F) mg/l, Max	0.84	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	0.21	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	0.055	0.02	0.1	IS-3025/59:2006, AAS-Flame
11	Nitrate (as NO_3), mg/l, Max	11.32	0.5	45	APHA, 22nd Edition, UV-Spectrphotometric
12	Odour	Agreeable	Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	7.94	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	38	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	107	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	0.257	0.04	0.05	IS-3025/52:2003, AAS-Flame
21	Total Dissolved Solids, mg/l, Max	565	25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c_aco_3), mg/l, Max	351	4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	2	1.0	1	IS-3025/10:1984 R-1996, Nephelometric
24	Zinc (as Zn), mg/l, Max	0.051	0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame
25	Nickel as Ni, mg/l Max	0.007	0.005	0.02	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

NOTE: *All parameters are in mg/l except pH..*

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WATER QUALITY

(MINE EFFLUENT- 25 PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2017-18.**

Name of the Cluster : **Cluster -VII** PERIOD: **Q. E. DECEMBER- 2017.**

Type of Sample: Mine Discharge Water Sample Name of Mine ENA COLLIERY

Testing Protocol: As per DW Standards (IS- 10500) Date of Sampling: 25-12-17

Sl. No	Parameter	Test Result	Detection Limit	Permissible Limit	Method of Testing
1	Boron (as B), mg/l, Max	<0.20	0.02	0.5	APHA, 22nd Edition ,Carmine
2	Colour,in Hazen Units	3	1	5	APHA, 22nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	52.7	1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	42	2.00	250	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	0.038	0.001	0.05	IS 3025/42 : 1992 R : 2009, AAS-Flame
6	Fluoride (as F) mg/l, Max	0.87	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	0.045	0.02	0.1	IS-3025/59:2006, AAS-Flame
11	Nitrate (as NO_3), mg/l, Max	11.65	0.5	45	APHA, 22nd Edition, UV-Spectrphotometric
12	Odour	Agreeable	Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	7.51	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	78	2.00	200	APHA, 22nd Edition. Turbidity
17	Taste	Acceptable	Qualitative	Acceptable	APHA, 22nd Edition. Taste
18	Total Alkalinity (c_ac_o3),, mg/l, Max	95	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	0.381	0.04	0.05	IS-3025/52:2003, AAS-Flame
21	Total Dissolved Solids, mg/l, Max	703	25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c_ac_o3), mg/l, Max	501	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	0.032	0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame
25	Nickel as Ni, mg/l Max	<0.005	0.005	0.02	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

NOTE: *All parameters are in mg/l except pH*

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WATER QUALITY

(MINE EFFLUENT- 25 PARAMETERS)

Name of the Company: **Bharat Coking Coal Limited** Year : **2017-18.**

Name of the Cluster : **Cluster -VII** PERIOD: **Q. E. DECEMBER- 2017.**

Type of Sample:	Mine Discharge Water Sample	Name of Mine	S JHARIA
Testing Protocol:	As per DW Standards (IS- 10500)	Date of Sampling:	23-12-17

Sl. No	Parameter	Test Result	Detection Limit	Permissible Limit	Method of Testing
1	Boron (as B), mg/l, Max	<0.20	0.02	0.5	APHA, 22nd Edition ,Carmine
2	Colour,in Hazen Units	2	1	5	APHA, 22nd Edition ,Pt.-Co. Method
3	Calcium (as Ca), mg/l, Max	60.5	1.60	75	IS-3025/40:1991, EDTA
4	Chloride (as Cl), mg/l, Max	38	2.00	250	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	0.008	0.001	0.05	IS 3025/42 : 1992 R : 2009, AAS-Flame
6	Fluoride (as F) mg/l, Max	0.35	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	0.057	0.02	0.1	IS-3025/59:2006, AAS-Flame
11	Nitrate (as NO_3), mg/l, Max	16.64	0.5	45	APHA, 22nd Edition, UV-Spectrphotometric
12	Odour	Agreeable	Qualitative	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
13	pH value	7.83	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	114	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	127	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	719	25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
22	Total Hardness (c_aco_3), mg/l, Max	415	4.00	200	IS-3025/21:1983, R-2002, EDTA
23	Turbidity, NTU, Max	5	1.0	1	IS-3025/10:1984 R-1996, Nephelometric
24	Zinc (as Zn), mg/l, Max	0.045	0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame
25	Nickel as Ni, mg/l Max	<0.005	0.005	0.02	IS 3025/ 49 : 1994, R : 2009, AAS-Flame

NOTE: *All parameters are in mg/l except pH*

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