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

(FOR THE MONTH JULY, 2024)

E. C. no. J-11015/77/2011-IA.II (M) dated 26.07.2019.



CMPDI

ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

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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 Ambient air sampling locations

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

2.2 Water sampling stations

The Water sampling stations were selected for mine sump water.

2.3 Noise level monitoring locations

Noise levels vary depending on the various activities in mining areas. The monitoring of noise level in different locations will be helpful to take appropriate mitigating measures. The rationale has been based on the guidelines stipulated by MoEF&CC, consent letter of SPCB, as well as other statutory requirements

3.0 Methodology of sampling and analysis

3.1 Ambient air quality

Parameters chosen for assessment of ambient air quality were Particulate Matter (PM₁₀), Fine Particulate Matter (PM_{2.5}), Sulphur Di-oxide (SO₂) and Nitrogen Oxides (NO_x). Respirable Dust Samplers (RDS) and Fine Dust

Sampler (PM_{2.5} sampler) were used for sampling of PM₁₀, SO₂, & NO_x and Fine Dust Sampler (PM_{2.5} sampler) were used for sampling of PM_{2.5} at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analysed in Environmental Laboratory of CMPDI, RI-II, Dhanbad.

3.2 Water quality

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

3.3 Noise level monitoring

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

4.0 Results and interpretations

4.1 Air quality

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

The following preventive and suppressive mitigative measures can be undertaken to contain the pollution level within prescribed level:-

- Wet drilling and controlled blasting should be practice.
- Explosive used should be optimised to restrict the dust generation.
- Transportation roads should be permanently asphalted free of ruts, potholes etc.
- Water should be sprayed on coal transportation road, service road more frequently and at regular interval.
- Dust from roads should be removed physically or mechanically.
- Greenbelts around industrial sites, service building area besides Avenue plantation along roads should be created.
- Coal dust should be suppressed by using fixed sprinklers.
- Regular maintenance of plant and machinery should be undertaken.

4.2 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 were within permissible limits.

4.3 Noise Level

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

INTRODUCTION

- 1.0 Any industry and development activities including coal mining is bound to affect environmental attributes. There are positive as well as negative impacts of such operations. For controlling the adverse impacts a regular monitoring is essential. The environmental monitoring is being done as per the guide-lines stipulated by Ministry of Environment, Forest and Climate Change (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 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-XI is in the Western & Southern part of the Jharia coalfield. It includes a group of 8 Mines (viz. Gopalichak UG&OC Mine, Kachhi Balihari 10/12 Pit UG Mine, PB UG Project, Bhagabandh UG Mine, Kenwadiah UG, Pootkee UG, Kachi Balihari 5/6 Pit UG, Moonidih UG mine). The Cluster – XI is situated about 25 - 30 kms from Dhanbad Railway Station. The mines of this Cluster – XI 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 Jarian nala & Damodar River.
- 1.2 The Project has Environmental Clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC) for a rated capacity 5.08 MTPA (normative) and 6.604 MTPA (peak) capacity of coal production vide letter no. J-11015/77/2011-IA.II (M) dated 26th July, 2019.

Ministry of Environment, Forest and Climate Change while granting environmental clearance has given one of the General conditions that “ Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for PM₁₀, PM_{2.5}, SO₂, NO_x monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets, other conditions regarding water / effluent and noise level monitoring in consultation with the State Pollution Control Board.”

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

AMBIENT AIR QUALITY MONITORING

2.1 Location of sampling station and their rationale:

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

2.1.1 Ambient Air Quality Sampling Locations

I. CORE ZONE Monitoring Location

i) **Pootkee Balihari Office (A16): Industrial Area**

The location of the sampling station is 23°45'17.23"N 86°21'46.27"E. The sampler was placed at an elevated platform approx. 1.5m above ground level at Project Office.

ii) **Moonidih UGP (A17): Industrial Area**

The location of the sampling station is 23°44'30.00"N 86°20'56.00"E. The sampler was placed at an elevated platform approx. 1.5m above ground level at project office.

iii) **Moonidih Washery (A29): Industrial Area**

The location of the sampling station is 23°44'26.00"N 86°21'16.00"E. The sampler was placed at a height of approx. 1.5m above ground level at Project office.

II. BUFFER ZONE Monitoring Location

I) **Kusunda OCP (A10)**

The location of the sampling station is 23°46'49.07"N 86°24'15.71"E. The sampler was placed at a height of approx. 1.5m above ground level at Safety Office.

AMBIENT AIR QUALITY DATA



CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
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Ambient Air Quality Test Report

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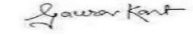
Test Report for Ambient Air Samples

Month & Year		07/2024	Cluster	Cluster XI			ULR No.	TC1012224000001052F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	23.09.2024	
Project		Pootkee Balihari Office		Sample Ref. No.	REM/BCCL/2024/07	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		11.07.2024		24.07.2024	Period of Analysis	11.07.2024 to 20.09.2024		Zone of Station:	Core Zone
Sl. No.	Parameter	Method Analysis	of	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
				1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017		85	95	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019		49	54	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017		<10	<10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017		30	28	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,


ANALYSED BY


 (Gaurav Kant)
CHECKED BY


 (Amit Raj Mishra)
Authorised Signatory

Note: The results above relate to the samples tested as received. This report can not be reproduced in part or full without the written permission of the HOD(Env), CMPDI, RI-II.

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Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

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Test Report for Ambient Air Samples										
Month & Year		07/2024		Cluster	Cluster XI			ULR No.	TC1012224000001052F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue	23.09.2024	
Project		Moonidih UGP		Sample Ref. No.	REM/BCCL/2024/07		Sampling Method	CMPDI/RI-II/LPM 13 , (IS 5182)		
Date of Sampling		12.07.2024		23.07.2024	Period of Analysis	12.07.2024 to 20.09.2024		Zone of Station:	Core Zone	
Sl. No.	Parameter	Method of Analysis	Observed Values (in $\mu\text{g}/\text{m}^3$)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009		
			1st FN	2nd FN						
1	PM ₁₀	IS -5182(Part 23):2006, R-2017	90	93	10 $\mu\text{g}/\text{m}^3$ - 1000 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$	300	100		
2	PM _{2.5}	IS -5182(Part 24):2019	48	42	10 $\mu\text{g}/\text{m}^3$ - 400 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$	Not Specified	60		
3	SO ₂	IS-5182(Part-2): 2001 , R-2017	<10	<10	10 $\mu\text{g}/\text{m}^3$ - 1050 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$	120	80		
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	24	30	06 $\mu\text{g}/\text{m}^3$ - 420 $\mu\text{g}/\text{m}^3$	06 $\mu\text{g}/\text{m}^3$	120	80		

* LDL indicates Lower Detection Limit,
 **All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

 ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) Authorised Signatory
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Environment Laboratory, Regional Institute-II
Ambient Air Quality Test Report

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Test Report for Ambient Air Samples

Month & Year		07/2024	Cluster	Cluster XI			ULR No.	TC1012224000001052F
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	23.09.2024
Project		Moonidih Washery	Sample Ref. No.	REM/BCCL/2024/07	Sampling Method		CMPDI/RI-II/LPM 13 , (IS 5182)	
Date of Sampling		12.07.2024	23.07.2024	Period of Analysis	12.07.2024 to 20.09.2024		Zone of Station:	Core Zone
Sl. No.	Parameter	Method of Analysis	Observed Values (in µg/m³)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
			1st FN	2nd FN				
1	PM ₁₀	IS -5182(Part 23):2006, R-2017	99	96	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	PM _{2.5}	IS -5182(Part 24):2019	56	46	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO ₂	IS-5182(Part-2): 2001 , R-2017	<10	10	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	29	28	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

* LDL indicates Lower Detection Limit,

**All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

[Signature]

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Authorised Signatory

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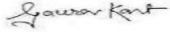
CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
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Ambient Air Quality Test Report



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Test Report for Ambient Air Samples											
Month & Year		07/2024		Cluster		Cluster XI		Report No.		TC1012224000001052F	
Customer		Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)						Date of Issue		23.09.2024	
Project		Kusunda		Sample Ref. No.		REM/BCCL/2024/07		Sampling Method		CMPDI/RI-II/LPM 13, (IS 5182)	
Date of Sampling		05.07.2024		22.07.2024		Period of Analysis		05.07.2024 to 20.09.2024		Zone of Station: Buffer Zone	
Sl. No.	Parameter	Method of Analysis	Observed Values (in $\mu\text{g}/\text{m}^3$)		Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009			
			1st FN	2nd FN							
1	PM ₁₀	IS -5182(Part 23):2006, R-2017	91	98	10 $\mu\text{g}/\text{m}^3$ - 1000 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$	300	100			
2	PM _{2.5}	IS -5182(Part 24):2019	49	54	10 $\mu\text{g}/\text{m}^3$ - 400 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$	Not Specified	60			
3	SO ₂	IS-5182(Part-2): 2001 , R-2017	12	10	10 $\mu\text{g}/\text{m}^3$ - 1050 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$	120	80			
4	NO ₂	IS-5182 (Part-6): 2006 , R-2017	30	29	06 $\mu\text{g}/\text{m}^3$ - 420 $\mu\text{g}/\text{m}^3$	06 $\mu\text{g}/\text{m}^3$	120	80			

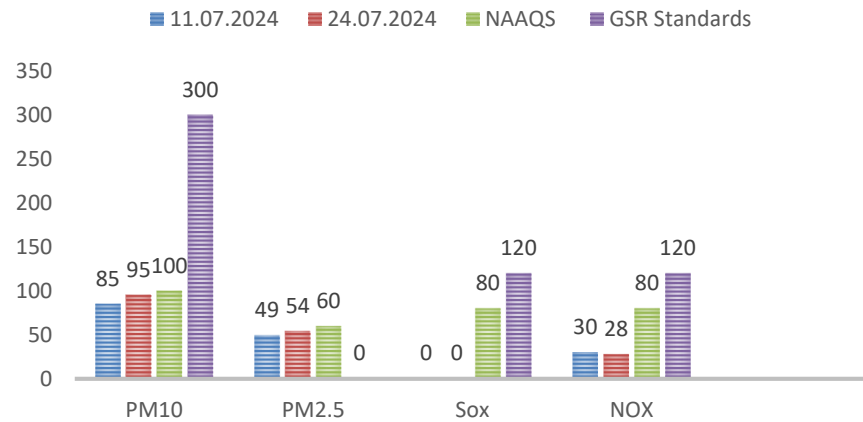
* LDL indicates Lower Detection Limit,
 **All units are in $\mu\text{g}/\text{m}^3$, 24 hourly Average,

 ANALYSED BY	 (Gaurav Kant) CHECKED BY	 (Amit Raj Mishra) Authorised Signatory
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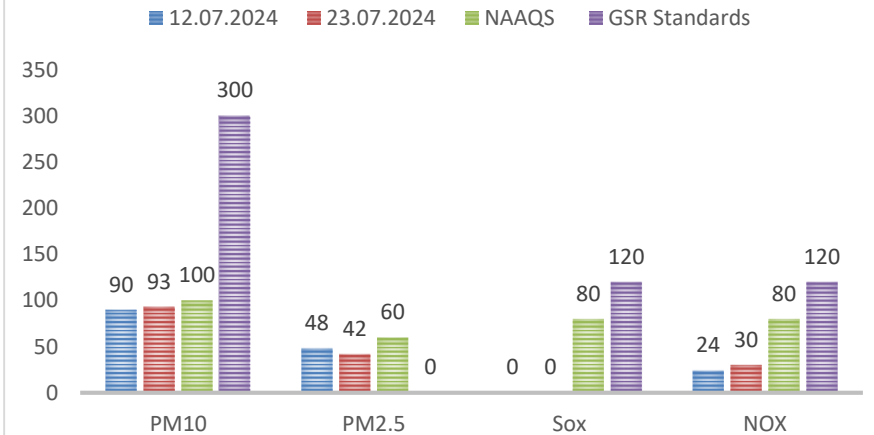
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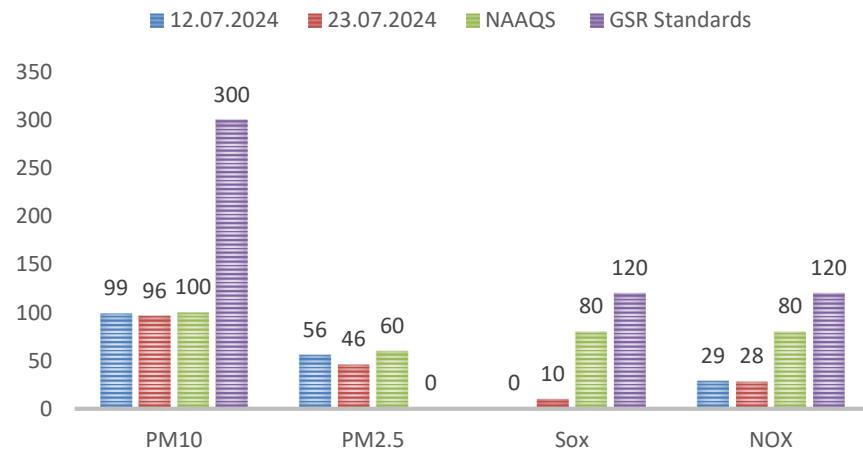
AMBIENT AIR QUALITY AT POOTKEE BALIHARI OFFICE



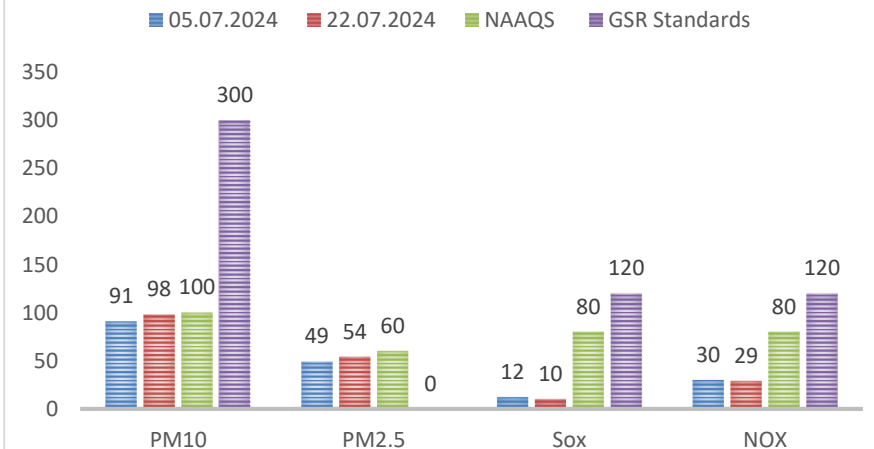
AMBIENT AIR QUALITY AT MOONIDIH UGP



AMBIENT AIR QUALITY AT MOONIDIH WASHERY



AMBIENT AIR QUALITY AT KUSUNDA OCP



WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. – II**)

i) Mine Discharge of Bhagabandh (MW11)

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.



CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
MINE EFFLUENT TEST REPORT

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Test Report for Mine Effluent samples

Month & Year	07/2024	Cluster	Cluster XI		ULR No.		TC1012224000001070F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)					Date of Issue	23.09.2024	
Project		Sampling Ref. No.	REM/BCCL/2024/ 07		Sampling Method	IS 3025 (Part-1)		CMPDI/RI-II/LPM 13
Sampling Stations	(i)	Bhagabandh	Sample Collected in 2.5 Ltr Jerricane , Color as observed is transparent			Period of Analysis	08.07.2024 to 06.08.2024	
			Date of Sampling		08.07.2024	22.07.2024		
Sl. No.	Parameter	Method of Analysis	Observed Values		STANDARDS FOR COAL MINES (Stipulated by Ministry of Environment and Forests (MoEF), Vide Notification No. GSR 742(E), Dt: 25.09.2000)	LDL		
			First Fortnight	Second Fortnight				
1	Total Suspended Solids	IS 3025/17:1984, R :2017, Gravimetric	36	37	100 (Max)	10		
2	pH	IS-3025/11:1983, R-2017, Electrometric	7.64	7.68	5.5 - 9.0	0.2		
3	Oil & Grease	IS 3025/39:1991, R : 2019, Partition Gravimetric	<2.0	<2.0	10 (Max)	2		
4	COD	APHA 23rd Edition 5220 C Titrimetric Method	36	36	250 (Max)	4		

***Grab sampling carried out for water samples **All units in mg/L unless specified otherwise *LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit,*

ANALYSED BY

(Kumar Vaibhav)

CHECKED BY

(Amit Raj Mishra)

Authorised Signatory

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 CMPDI, RI-II.*

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NOISE LEVEL QUALITY MONITORING

4.1 Location of sampling sites

- 1. Pootkee Balihari Office (N16)**
- 2. Moonidih UGP (N17)**
- 3. Moonidih Washery (N29)**
- 4. Kusunda OCP (N10)**

4.2 Noise level measurements in form of ' L_{EQ} ' were taken using Integrated Data Logging Sound Level Meter during day time & night time. Noise levels were measured for the complete day & night time, the Intergration time taken was one hour or 3600 seconds. 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 & night time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day & night 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.



cmpdi
A Mini Ratna Company

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

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Month & Year	07/2024	Cluster	Cluster XI				ULR No.	TC1012224000001086F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	23.09.2024
Project		Sample Ref. No.	REM/BCCL/2024/ 07			Sampling Method	CMPDI/RI-II/LPM 22		
Sampling Stations	i	Pootki Balihari Office		Date of Sampling	11.07.2024	24.07.2024	Zone Category of Station:	Core Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	53.9	55.2	CPCB, Protocol for Ambient Level Noise Monitoring -2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	57.4	58					
3		08:00 - 09:00	58.1	58.9					
4		09:00 - 10:00	66.8	67.5					
5		10:00 - 11:00	68.4	69.3					
6		11:00 - 12:00	63.4	64.2					
7		12:00 - 13:00	61.6	61					
8		13:00 - 14:00	58.9	58.7					
9		14:00 - 15:00	57.7	55.4					
10		15:00 - 16:00	54.6	55.1					
11		16:00 - 17:00	53.9	53.4					
12		17:00 - 18:00	53.5	54.3					
13		18:00 - 19:00	53.5	54					
14		19:00 - 20:00	51.7	52.9					
15		20:00 - 21:00	51.6	51.8					
16		21:00 - 22:00	51.5	51					
		Leq Day	60.9	61.5					
1	Noise Level dB(A)Leq -Night	22:00-23:00	45.9	46.1	CPCB, Protocol for Ambient Level Noise Monitoring -2015	35 dB- 135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	40.7	40.9					
3		00:00- 01:00	39.7	40.6					
4		01:00-02:00	39.6	40.4					
5		02:00-03:00	39.1	39.3					
6		03:00-04:00	43.3	43.2					
7		04:00-05:00	42.2	42.3					
8		05:00-06:00	42.7	42.5					
		Leq Night	40.2	40.5					
**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit									
Sampling Assistants			 (Gaurav Kant)						 (Amit Raj Mishra)
ANALYSED BY			CHECKED BY						Authorised Signatory
Note: The results above relate to the samples tested as received. This report cannot be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.									
---- End of Report ----									
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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDIL, RI-II
 KOYLA BHAWAN OMPLEX
 DHANBAD. -826005
 Phone:0326-223-850
 email:i2cmpdi@coalindia.in

Month & Year	07/2024	Cluster	Cluster XI				ULR No.	TC1012224000001086F	
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	23.09.2024
Project			Sample Ref. No.	REM/BCCL/2024/07		Sampling Method	CMPDI/RI-II/LPM 22		
Sampling Stations	i	Moonidih UGP		Date of Sampling	12.07.2024	23.07.2024	Zone Category of Station:	Core Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
			First Fortnight	Second Fortnight				Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	53.7	54.4	CPCB, Protocol for Ambient Level Noise Monitoring -2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	49	49.9					
3		08:00 - 09:00	57.1	58.8					
4		09:00 - 10:00	55.1	52.4					
5		10:00 - 11:00	58.3	57.2					
6		11:00 - 12:00	61.8	62.7					
7		12:00 - 13:00	59.8	59.5					
8		13:00 - 14:00	61.6	59.6					
9		14:00 - 15:00	57.6	57.2					
10		15:00 - 16:00	55.7	55.1					
11		16:00 - 17:00	55.3	55.5					
12		17:00 - 18:00	54.8	55.5					
13		18:00 - 19:00	54	54.4					
14		19:00 - 20:00	54.6	54.3					
15		20:00 - 21:00	53	52.8					
16		21:00 - 22:00	52.5	52.7					
		Leq Day	57.1	57.0					
1	Noise Level dB(A)Leq -Night	22:00-23:00	44.6	44.6	CPCB, Protocol for Ambient Level Noise Monitoring -2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	39.6	39.7					
3		00:00- 01:00	38.8	39.7					
4		01:00-02:00	38.1	38.7					
5		02:00-03:00	37.9	38					
6		03:00-04:00	42.2	42.4					
7		04:00-05:00	43.6	43.7					
8		05:00-06:00	42	42.2					
		Leq Night	39.8	40.2					
**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit									
Sampling Assistants			 (Gaurav Kant)			 (Amit Raj Mishra)			
ANALYSED BY			CHECKED BY			Authorised Signatory			
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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-II
Ambient Noise Level Test Report

CMPDIL, RI-II
 KOYLA BHAWAN COMPLEX
 DHANBAD. -826005
 Phone:0326-223-850
 email: rdri2cmpdi@coalindia.in

Month & Year	07/2024	Cluster	Cluster XI				ULR No.	TC1012224000001086F		
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)								Date of Issue	23.09.2024
Project		Sample Ref. No.	REM/BCCL/2024/07				Sampling Method	CMPDI/RI-II/LPM 22		
Sampling Stations	i	Moonidih Washery		Date of Sampling	12.07.2024	23.07.2024	Zone Category of Station:	Core Zone		
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A))	Observed Values (in Leq dB(A))	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards		
			First Fortnight	Second Fortnight				Zones	Limits in dB	
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	52.5	52.7	CPCB, Protocol for Ambient Level Noise Monitoring -2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50	
2		07:00 - 08:00	55.1	55.5						
3		08:00 - 09:00	59	58.5						
4		09:00 - 10:00	62.8	62.9						
5		10:00 - 11:00	65.2	65.2						
6		11:00 - 12:00	66.3	63.7						
7		12:00 - 13:00	68.2	69						
8		13:00 - 14:00	67.5	67.5						
9		14:00 - 15:00	62	62.9						
10		15:00 - 16:00	62.9	61.7						
11		16:00 - 17:00	61.2	59.1						
12		17:00 - 18:00	59.8	59						
13		18:00 - 19:00	58.3	58.2						
14		19:00 - 20:00	57.1	57.7						
15		20:00 - 21:00	56.1	54.3						
16		21:00 - 22:00	53.7	54.4						
			62.8	62.6						
1	Noise Level dB(A)Leq -Night	22:00-23:00	50.1	50.7	CPCB, Protocol for Ambient Level Noise Monitoring -2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50	
2		23:00- 00:00	42.1	41.4						
3		00:00- 01:00	38.4	38.3						
4		01:00-02:00	38.1	38.1						
5		02:00-03:00	37.8	36.9						
6		03:00-04:00	41.6	42.3						
7		04:00-05:00	43.6	42						
8		05:00-06:00	42	42.2						
		Leq Night	39.6	39.4						
**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit										
Sampling Assistants			 (Gaurav Kant)			 (Amit Raj Mishra)				
ANALYSED BY			CHECKED BY			Authorised Signatory				
Note: The results above relate to the samples tested as received. This report cannot be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.										
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 cmpdi A Mini Ratna Company CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED Environment Laboratory, Regional Institute-II Ambient Noise Level Test Report CMPDIL, RI-II KOYLA BHAWAN COMPLEX DHANBAD. -826005 Phone:0326-223-850 email: rdri2cmpdi@coalindia.in									
Month & Year	07/2024	Cluster	Cluster XI					ULR No.	TC1012224000001086F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)							Date of Issue	23.09.2024
Project		Sample Ref. No.	REM/BCCL/2024/ 07			Sampling Method	CMPDI/RI-II/LPM 22		
Sampling Stations	i	Kusunda OCP		Date of Sampling	05.07.2024	22.07.2024	Zone Category of Station:	Bufferr Zone	
Sl. No.	Parameter	Hour / Time of day	Observed Values (in Leq dB(A)) First Fortnight	Observed Values (in Leq dB(A)) Second Fortnight	Method of Analysis	Range Of Testing	LDL	NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 Standards	
								Zones	Limits in dB
1	Noise Level dB(A)Leq - Day	06:00 - 07:00	52.5	52.8	CPCB, Protocol for Ambient Level Noise Monitoring -2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	75 65 55 50
2		07:00 - 08:00	56.1	53.1					
3		08:00 - 09:00	59.5	55.4					
4		09:00 - 10:00	65.2	63.3					
5		10:00 - 11:00	67.5	66.2					
6		11:00 - 12:00	66	64.6					
7		12:00 - 13:00	69.2	67.7					
8		13:00 - 14:00	69.7	68.3					
9		14:00 - 15:00	69.7	63.1					
10		15:00 - 16:00	62.7	62					
11		16:00 - 17:00	62.9	69.4					
12		17:00 - 18:00	62.4	61					
13		18:00 - 19:00	59.7	59					
14		19:00 - 20:00	59.9	59					
15		20:00 - 21:00	59.3	58.3					
16		21:00 - 22:00	59.7	58.4					
		Leq Day	65.0	63.9					
1	Noise Level dB(A)Leq - Night	22:00-23:00	52.8	38.7	CPCB, Protocol for Ambient Level Noise Monitoring -2015	35 dB-135 dB	35 dB(A)	Industrial Commercial Residential Silence	70 55 45 50
2		23:00- 00:00	46.7	34.8					
3		00:00- 01:00	45.8	34.4					
4		01:00-02:00	42.1	34.3					
5		02:00-03:00	40.7	34					
6		03:00-04:00	42.3	37.3					
7		04:00-05:00	43.2	37					
8		05:00-06:00	42.8	36.8					
		Leq Night	42.7	34.7					
**All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit									
Sampling Assistants		 (Gaurav Kant)				 (Amit Raj Mishra)			
ANALYSED BY		CHECKED BY						Authorised Signatory	
Note: The results above relate to the samples tested as received. This report cannot be reproduced in part or full without the written permission of the HOD(Env) , CMPDI, RI-II.									
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Ambient Air Quality Standards for Jharia Coal Field
As per the Environment (Protection) Amendment Rules, 2000 notified vide notification G.S.R. 742(E), dated 25.9.2000.

Category	Pollutant	Time weighted average	Concentration in Ambient Air	Method of Measurement
1	2	3	4	5
III Coal mines located in the coal fields of • Jharia • Raniganj • Bokaro	Suspended Particulate Matter (SPM)	Annual Average * 24 hours **	500 µg/m ³ 700 µg/m ³	- High Volume Sampling (Average flow rate not less than 1.1 m ³ /min)
	Respirable Particulate Matter (size less than 10 µm) (RPM)	Annual Average * 24 hours **	250 µg/m ³ 300 µg/m ³	Respirable Particulate Matter sampling and analysis
	Sulphur Dioxide (SO ₂)	Annual Average * 24 hours **	80 µg/m ³ 120 µg/m ³	1.Improvedwest and Gaeke method 2.Ultraviolet fluorescene
	Oxide of Nitrogen as NO ₂	Annual Average * 24 hours **	80 µg/m ³ 120 µg/m ³	1. Jacob & Hochheiser Modified (Na-Arsenic) Method 2. Gas phase Chemilumine-scence

Note:

* Annual Arithmetic mean for the measurements taken in a year, following the guidelines for frequency of sampling laid down in clause 2.

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

NATIONAL AMBIENT AIR QUALITY STANDARDS

New Delhi the 18th November 2009

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

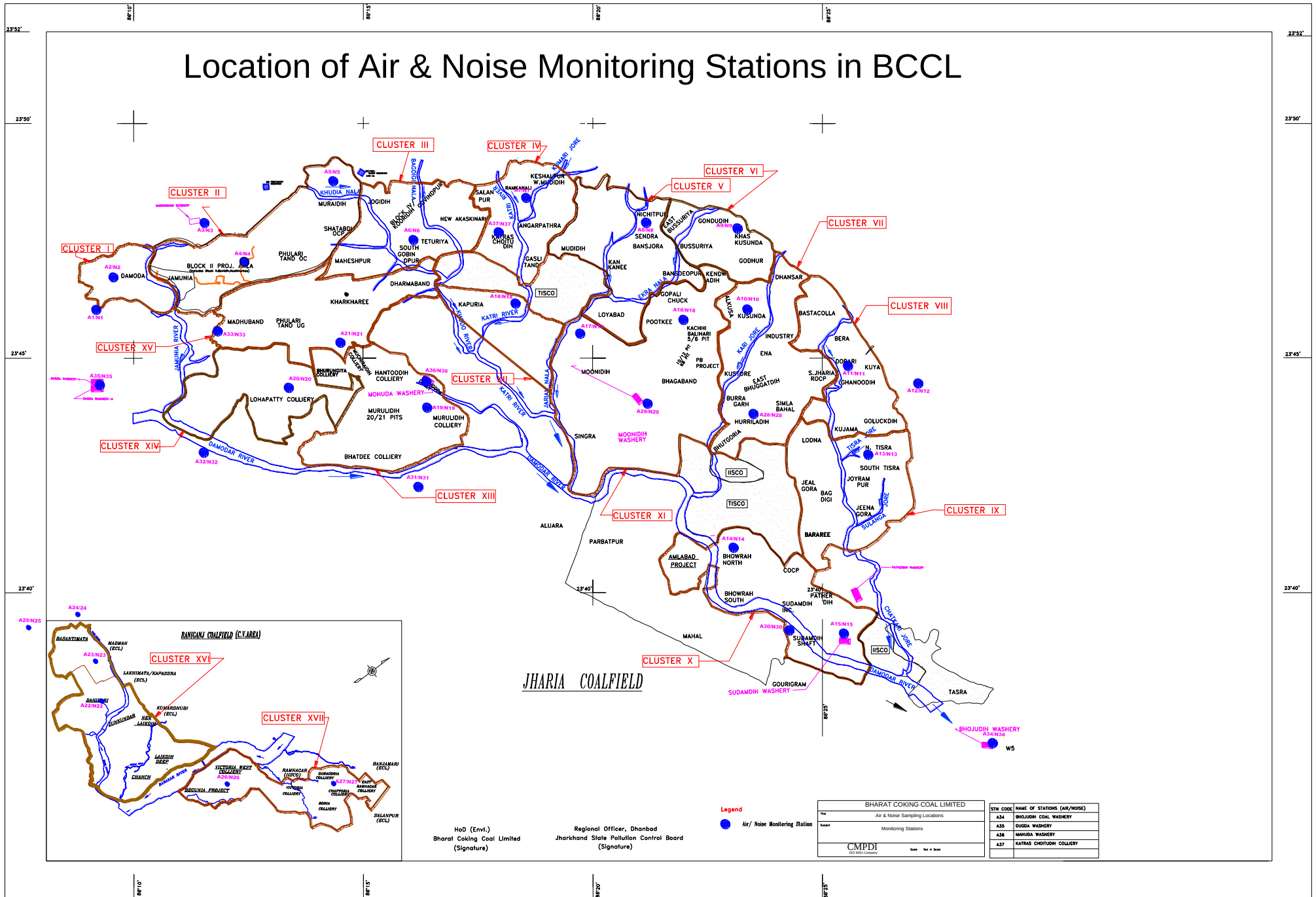
Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO₂), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet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

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

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

NOTE: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category,

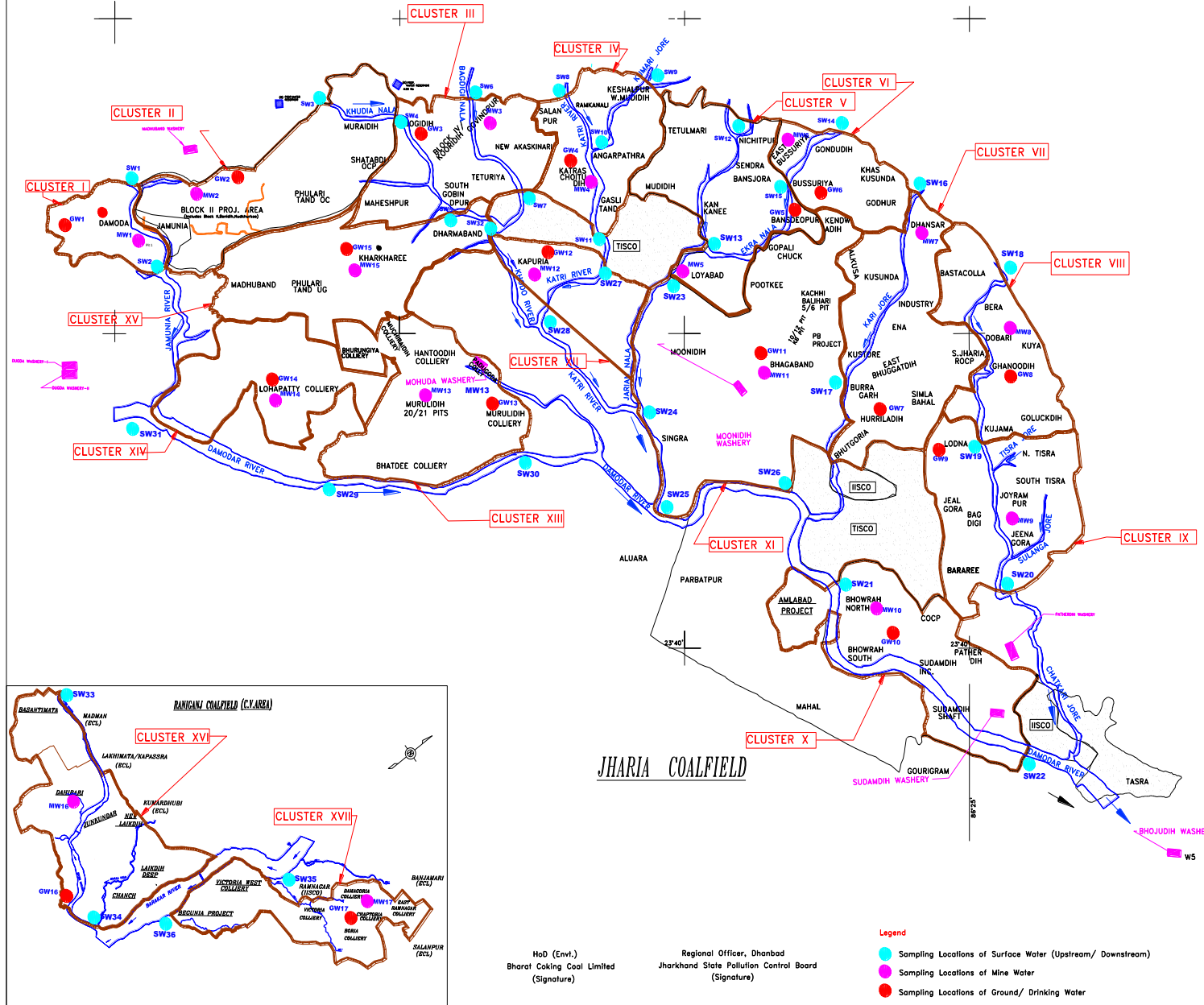
Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL

INDEX

Cluster	Surface Water (U/S, D/S)	Name of River/Na/Effluent	Minel Effluent	Sampling Location	Ground Water	Sampling Location
I	SW1, SW2	Jamunia River	MW1	Damoda Area	GW1	Chutway 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, Kuman Jore	MW4	Chotudih	GW4	Kankane Village
V	SW12, SW13, SW15	Jarian Nala, Ekra Nala	MW5	Mudidi	GW5	Nichitpur
VI	SW14, SW15	Ekra Nala	MW6	East Bassuria UGP	GW6	Bansara Borewell
VII	SW16, SW17	Kan Jore	MW7	Doban UGP	GW7	Humadih
VIII	SW18, SW19	Kan Jore	MW8	Doban UGP	GW8	Gharudih
IX	SW19, SW20	Kan Jore	MW9	Jemagra North	GW9	Lodna
X	SW21, SW22	Damodar River	MW10	Bhowrah North	GW10	Bhowrah South
XI	SW23, SW24, SW25, SW26	Kan River, Damodar River	MW11	Bhagband UGP	GW11	Bhagband
XII	SW27, SW28	Kan River	MW12	Kapuria	GW12	Kapuria
XIII	SW29, SW30	Damodar River	MW13	Muridih (20/21)	GW13	Muridih
XIV	SW31, SW32	Damodar River	MW14	Lohapatti	GW14	Lohapatti
XV	SW5, SW32	Kharkharee UGP	MW15	Kharkharee	GW15	Kharkharee
XVI	SW33, SW34	Khudia River	MW16	Bahabari OCP	GW16	Pallabani Village
XVII	SW35, SW36	Barakar River	MW17	Damagoria Colliery	GW17	Chaptoria



Company	BHARAT COKING COAL LIMITED
Title	WATER SAMPLING LOCATIONS
Subject	MONITORING STATIONS
Scale	1:10,000
Date	10/10/2023