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

(FOR THE MONTH JULY 2024)

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

CMPDI
ISO 9001 Company
Regional Institute-II
Dhanbad, Jharkhand

CONTENTS

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 $23^0$37' N to $23^0$52' N latitudes and $86^0$09' E to $86^0$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 (PM_{10}), Fine Particulate Matter ($PM_{2.5}$), Sulphur Di-oxide (SO_2) and Nitrogen Oxides (NO_2). Respirable Dust Samplers (RDS) and Fine

Dust Sampler ($PM_{2.5}$ sampler) were used for sampling of $PM_{10,}$ SO_2, & 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 analysed for four parameters on fortnightly basis. Thereafter the samples were preserved and analysed at the Environmental Laboratory of CMPDI, RI- II, Dhanbad.

3.3 Noise level monitoring

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

4.0 Results and interpretations

4.1 Air quality

It has been seen from the analysis results that the 24 hours average concentration parameters like $PM_{10,}$ $PM_{2.5}$, SO_2 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 PM_{10}& $PM_{2.5}$ 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

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 I is in the westernmost part of the Jharia coalfield. It includes Damoda OCP, Damoda UG. The Cluster – I is situated at a distance of about 40 - 45 kms from Dhanbad Railway Station. The mines of this cluster 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 Jamunia River.

1.2 The Cluster I is designed to produce 0.9 MTPA (normative) and 1.17 MTPA peak capacity of coal. The average grade of coal W-II to W-IV.

The Project is being worked by deploying shovel dumper combination.

The Project has been granted Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEF&CC) for a rated capacity of 0.9 MTPA (normative) and 1.17 MTPA peak capacity of coal production vide letter no **E. C. no. J-11015/93/2009-IA.II (M) dated 06.02.2013.**

Ministry of Environment, Forest and Climate Change while granting environmental clearance has given one of the General conditions that " Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for PM_{10}, $PM_{2.5}$, SO_2, NOx 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) Damoda (A2): Industrial Area

The location of the sampling station is 23°46'9.00"N & 86°10'38.00"E. The sampler was placed at a height of approx. 1.5m above ground level.

II. BUFFER ZONE Monitoring Location

i) Karmatand village (A1) : Residential area

The location of the sampling station is at 23°45'58.20"N & 86° 9'30.59"E in Karmatand village. The sampler was placed at a height of approx. 1.5m above ground level.

ii) Madhuband washery (A3) : Industrial area

The location of the sampling station is at 23°47'24.01"N & 86°11'32.00"E in the Washery premises. The sampler was placed at a height of approx. 1.5m above ground level.

iii) Block II OCP (A4): **Industrial Area**

The location of the sampling station is 23°47'2.00"N & 86°11'15.00"E . The sampler was placed at an elevated platform of approx. height 1.5m above ground level near water treatment plant of Block II OCP.

iv) Regional Hospital Baghmara (A42): Residential Area

The location of the sampling station is 23°47'57"N & 86°12'39"E The sampler was placed at an elevated platform of approx. height 1.5m above ground level at Regional Hospital Baghmara.

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 I**	**ULR NO.**	**TC1012224000001042F**
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**			**Date of Issue**	**23.09.2024**
Project	**Damoda (A2)**	**Sample Ref. No.**	**REM/BCCL/2024/07**	**Sampling Method**	**CMPDI/RI-II/LPM 11 , (IS 5182)**
Date of Sampling	10.07.2024 – 25.07.2024	**Period of Analysis**	**10.07.2024 to 20.09.2024**	**Zone of Station:** **Core Zone**	**AREA** **Industrial Area**

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	87	98	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	$PM_{2.5}$	IS -5182(Part 24):2019	37	45	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	24	27	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

** LDL indicates Lower Detection Limit,*

***All units are in µg/m3, 24 hourly Average,*

ANALYSED BY

(Gaurav Kant)
REVIEWED BY

(Amit Raj Mishra)
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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Test Report for Ambient Air Samples

Month & Year	**07/2024**	**Cluster**	**Cluster I**	**ULR NO.**	**TC1012224000001042**
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**			**Date of Issue**	**23.09.2024**
Project	**Karmatand village(A1)**	**Sample Ref. No.**	**REM/BCCL/2024/07**	**Sampling Method**	**CMPDI/RI-II/LPM 11 , (IS 5182)**
Date of Sampling	**12.07.2024 TO 29.07.2024**	**Period of Analysis**	**12.07.2024 to 20.09.2024**	**Zone of Station:**	**Buffer zone**	**AREA**	**Residential area**

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	89	93	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	$PM_{2.5}$	IS -5182(Part 24):2019	39	42	10 µg/m³ - 400 µg/m³	10 µg/m³	Not Specified	60
3	SO_2	IS-5182(Part-2): 2001 , R-2017	<10	11	10 µg/m³ - 1050 µg/m³	10 µg/m³	120	80
4	NO_2	IS-5182 (Part-6): 2006 , R-2017	20	22	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

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***All units are in µg/m3, 24 hourly Average,*

ANALYSED BY

(Gaurav Kant)
REVIEWED BY

(Amit Raj Mishra)
Authorised Signatory

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

Test Report for Ambient Air Samples

Month & Year	**07/2024**	**Cluster**	**Cluster I**	**ULR NO.**	**TC1012224000001042F**
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**			**Date of Issue**	**23.09.2024**
Project	**Madhuband washery (A3)**	**Sample Ref. No.**	**REM/BCCL/2024/ 07**	**Sampling Method**	**CMPDI/RI-II/LPM 11 , (IS 5182)**
Date of Sampling 15.07.2024 TO 30.07.2024	**Period of Analysis**	**15.07.2024 to 20.09.2024**	**Zone of Station:**	**Buffer Zone**	**AREA** / **Industrial area**

Sl. No.	Parameter	Method of Analysis	Observed Values (in µg/m³) 1st FN	Observed Values (in µg/m³) 2nd FN	Range Of Testing	LDL	MoEF Standards Notification dated 25th September,2000 (GSR 742 E)	NAAQS, 2009
1	PM_{10}	IS -5182(Part 23):2006, R-2017	95	87	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	$PM_{2.5}$	IS -5182(Part 24):2019	57	44	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	29	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

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***All units are in µg/m3, 24 hourly Average,*

(Gaurav Kant)

(Amit Raj Mishra)

ANALYSED BY ***REVIEWED BY*** ***Authorised Signatory***

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Test Report for Ambient Air Samples

Month & Year	**07/ 2024**	**Cluster**	**Cluster I**	**ULR NO.**	**TC1012224000001042F**
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**			**Date of Issue**	**23.09.2024**
Project	**Block II OCP (A4)**	**Sample Ref. No.**	**REM/BCCL/2024 /07**	**Sampling Method**	**CMPDI/RI-II/LPM 11 , (IS 5182)**
Date of Sampling: 10.07.2024 TO 25.07.2024	**Period of Analysis**	**10.07.2024 TO 20.09.2024**		**Zone of Station: Buffer Zone**	**AREA Industrial Area**

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	133	99	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	$PM_{2.5}$	IS -5182(Part 24):2019	67	55	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	26	27	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

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***All units are in µg/m3, 24 hourly Average,*

(Gaurav Kant) (Amit Raj Mishra)

ANALYSED BY ***REVIEWED BY*** ***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 I**	**ULR NO.**	**TC1012224000001042F**
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**			**Date of Issue**	**23.09.2024**
Project	**Hospital Baghmara (A42)**	**Sample Ref. No.**	**REM/BCCL/2024/ 07**	**Sampling Method**	**CMPDI/RI-II/LPM 11 , (IS 5182)**
Date of Sampling 09.07.2024 TO 24.07.2024	**Period of Analysis**	**09.07.2024 TO 20.09.2024**		**Zone of Station:** **Buffer Zone**	**AREA** **Residential Area**

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	90	90	10 µg/m³ - 1000 µg/m³	10 µg/m³	300	100
2	$PM_{2.5}$	IS -5182(Part 24):2019	50	60	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	22	21	06 µg/m³ - 420 µg/m³	06 µg/m³	120	80

***All units are in µg/m3, 24 hourly Average * LDL indicates Lower Detection Limit,*

ANALYSED BY

(Gaurav Kant)
REVIEWED BY

(Amit Raj Mishra)
Authorised Signatory

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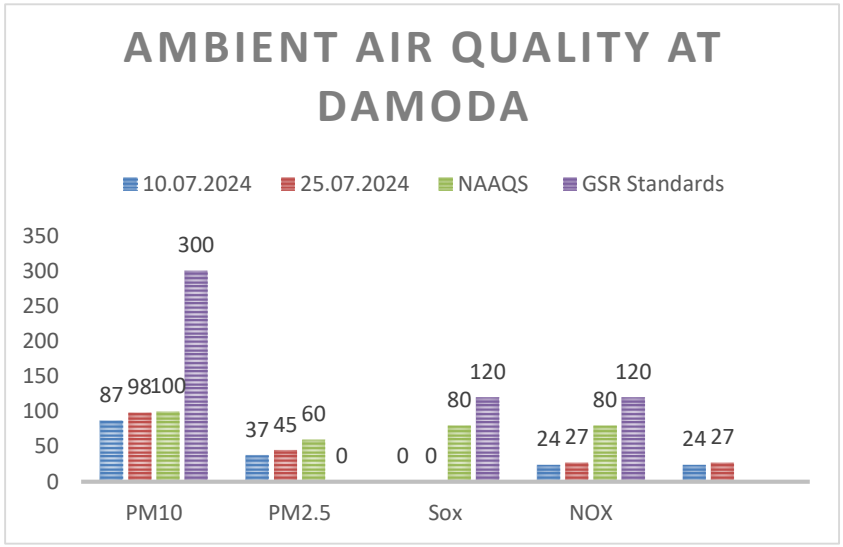
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Sox
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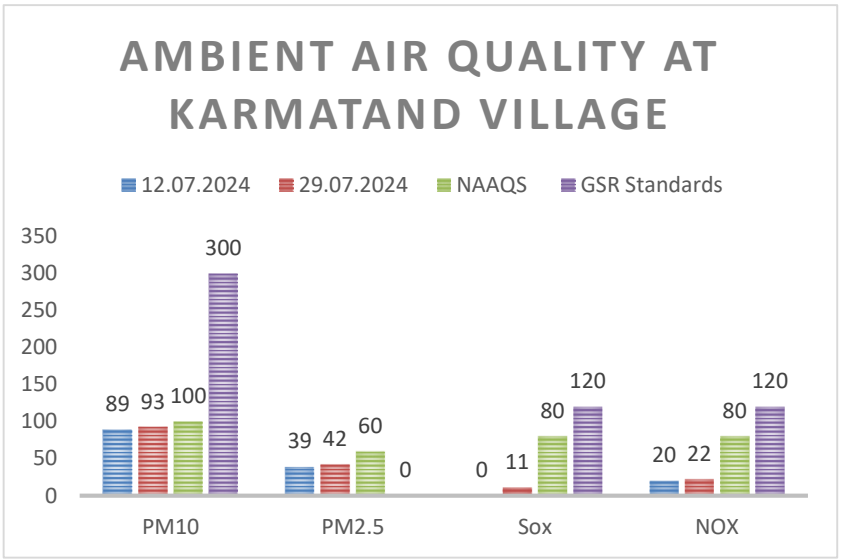
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29.07.2024
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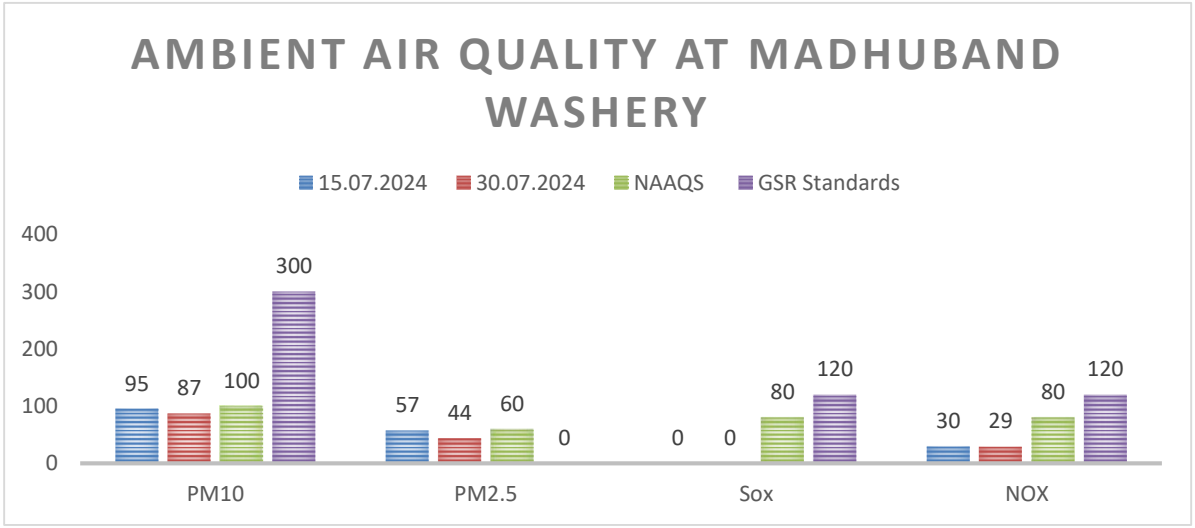
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30.07.2024
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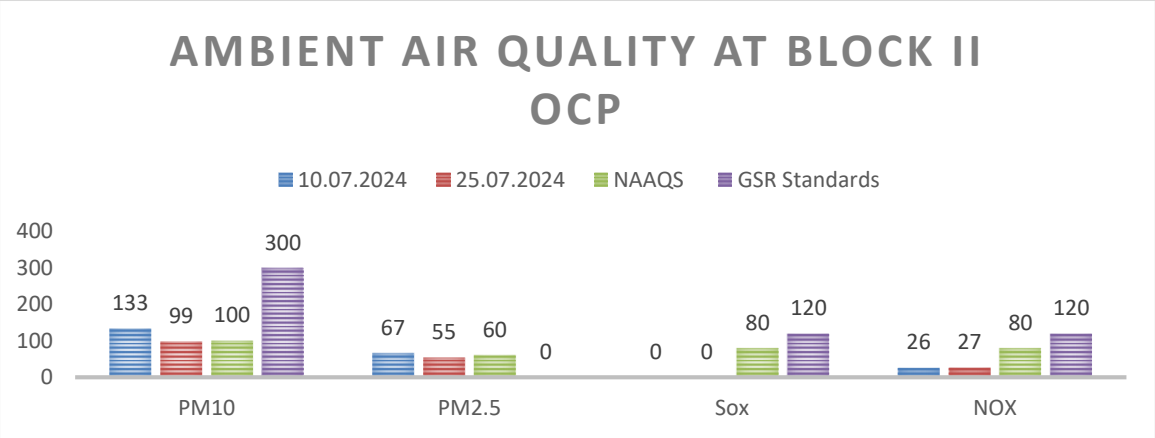
30 29 80 120
PM10
PM2.5
Sox
NOX


AMBIENT AIR QUALITY AT BLOCK II OCP
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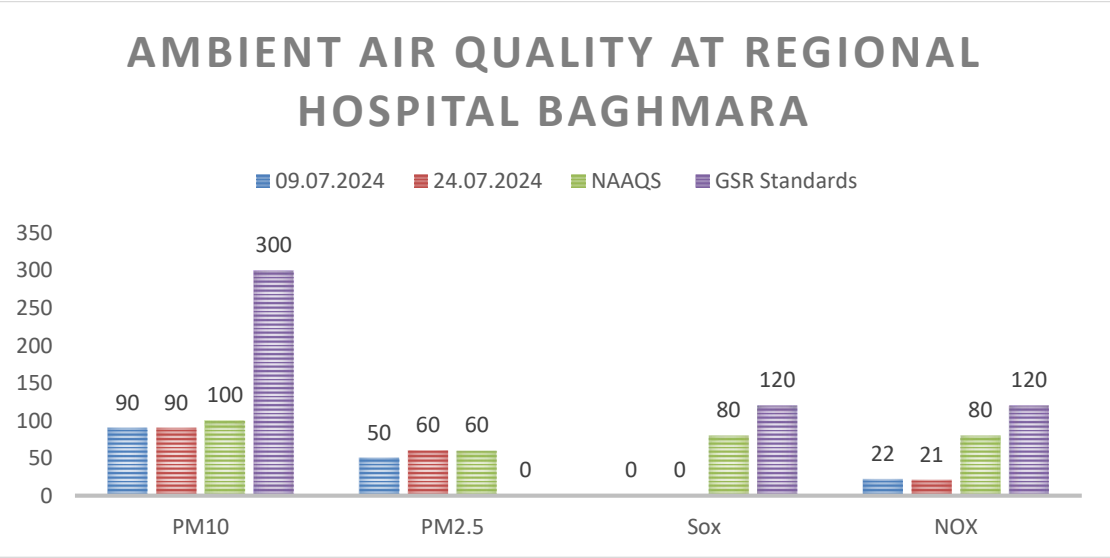
AMBIENT AIR QUALITY AT REGIONAL HOSPITAL BAGHMARA
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24.07.2024
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PM10
PM2.5
Sox
NOX

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. – II**)

i) **Mine Discharge of Damoda (MW1)**

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

ii) **Mine Discharge of Madhuband (MW23)**

A sampling point is fixed to assess the effluent quality of Mine discharge.

3.2 Methodology of sampling and analysis

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

3.3 Results & Interpretations

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

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

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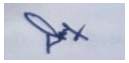
Test Report for Mine Effluent samples

Month & Year	**07/ 2024**	**Cluster**	**Cluster I**	**ULR NO.**		**TC1012224000001060F**	
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**					**Date of Issue**	**23.09.2024**
Project	**Damoda**	**Sampling Ref. No.**	**REM/BCCL/2024/07**	**Sampling Method**		**IS 3025 (Part-1)**	**CMPDI/RI-II/LPM 13**
Period of Analysis	**Damoda**		**Date of Sampling**		**Sample Collected in 2.5 Ltr Jerricane , Color as observed is transparent**		
			01.07.2024	**22.07.2024**	Period of Analysis	**01.07.2024 to 06.08.2024**	

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	46	47	*100 (Max)*	10
2	pH	IS-3025/11:1983, R-2017, Electrometric	7.33	7.29	*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	42	*250 (Max)*	4

*****All units in mg/L unless specified otherwise *LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit,***

***Grab sampling carried out for water samples.*



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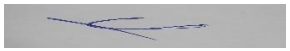

(Kumar Vaibhav)
REVIEWED BY

(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.

---- End of Report ----

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

CMPDIL, RI-II
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DHANBAD. -826005
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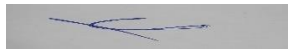
Test Report for Mine Effluent samples

Month & Year	**07/2024**	**Cluster**	**Cluster I**	**ULR NO.**		TC1012224000001060F	
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**					**Date of Issue**	**23.09.2024**
Project	**Madhuband**	**Sampling Ref. No.**	**REM/BCCL/2024/ 07**	**Sampling Method**		**IS 3025 (Part-1)**	**CMPDI/RI-II/LPM 13**
station	**Madhuband**		**Date of Sampling**		**Sample Collected in 2.5 Ltr Jerricane , Color as observed is transparent**		
			01.07.2024	22.07.2024	Period of Analysis	**01.07.2024 to 06.08.2024**	

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	39	34	*100 (Max)*	10
2	pH	IS-3025/11:1983, R-2017, Electrometric	7.55	7.54	*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	44	40	*250 (Max)*	4

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



(Kumar Vaibhav)

(Amit Raj Mishra)

ANALYSED BY ***REVIEWED BY*** ***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.

---- End of Report ----

NOISE LEVEL QUALITY MONITORING

4.1Location of sampling sites

i) **Karmatand village (N1)**

ii) **Damoda Colliery(N2)**

iii) **Madhuband Washery (N3)**

iv) **Block – II OCP (N4)**

V) **Regional Hospital Baghmara (N42):**

4.2 Methodology of sampling and analysis

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).

4.2 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.

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

Environment Laboratory, Regional Institute-II

Ambient Noise Level Test Report

Month & Year	**07/2024**	**Cluster**	**CLUSTER I**	**ULR NO.**	**TC1012224000001076F**
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**			**Date of Issue**	**23.09.2024**
Project	**Karmatand village**	**Sample Ref. No.**	**REM/BCCL/2024/07**	**Sampling Method**	**CMPDI/RI-II/LPM 22**
Station	**Karmatand**	**Date of Sampling**	**12.07.2024**	**29.07.2024**	**Zone Category of Station:** / **Buffer 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	40.5	41.2	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	42.5	40.9					
3		08:00 - 09:00	43.9	44.5					
4		09:00 – 10:00	44.4	44.5					
5		10:00 - 11:00	44.6	45					
6		11:00 - 12:00	45	44.8					
7		12:00 - 13:00	46.1	47.4					
8		13:00 - 14:00	46.2	46.5					
9		14:00 - 15:00	46.8	46.8					
10		15:00 - 16:00	47.1	47.9					
11		16:00 - 17:00	47.2	48.3					
12		17:00 - 18:00	47.9	47.9					
13		18:00 - 19:00	45.9	47.5					
14		19:00 - 20:00	44.5	45.1					
15		20:00 - 21:00	41.5	44.6					
16		21:00 - 22:00	41.1	41.3					
		Leq DAY	45.2	45.8					
1	Noise Level dB(A)Leq -Night	22:00-23:00	36.9	35.8	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	32.9	30.9					
3		00:00- 01:00	30.8	30.1					
4		01.00-02.00	30.6	30.5					
5		02.00-03.00	30.4	30.4					
6		03.00-04.00	33.2	32.6					
7		04.00-05.00	33.2	32.5					
8		05:00-06:00	36.6	32.1					
		Leq NIGHT	31.9	30.2					

***All noise measurements are integrated for a 01 hour period, All units in dB(A) *LDL indicates Lower Detection Limit*

Sampling Assistants
ANALYSED BY

(Gaurav Kant)
REVIEWED 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.

---- End of Report ----

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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

Environment Laboratory, Regional Institute-II

Ambient Noise Level Test Report

Month & Year	**07/ 2024**	**Cluster**	**Cluster I**	**ULR NO.**	**TC1012224000001076F**
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**			**Date of Issue**	**23.09.2024**
Project	**Damoda Colliery**	**Sample Ref. No.**	**REM/BCCL/2024/ 07**	**Sampling Method**	**CMPDI/RI-II/LPM 22**
			Date of Sampling 10.07.2024	25.07.2024	**Zone Category of Station:** **Core 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	53.3	53.9	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	56.8					
3		08:00 - 09:00	58.8	59.4					
4		09:00 – 10:00	65.2	66					
5		10:00 - 11:00	66.5	66.4					
6		11:00 - 12:00	65.2	66					
7		12:00 - 13:00	64.5	69.1					
8		13:00 - 14:00	67.2	68.3					
9		14:00 - 15:00	59	59.6					
10		15:00 - 16:00	59.5	59.9					
11		16:00 - 17:00	59	59.4					
12		17:00 - 18:00	56.7	58.5					
13		18:00 - 19:00	57.1	57.4					
14		19:00 - 20:00	54.3	56.6					
15		20:00 - 21:00	53.1	54.1					
16		21:00 - 22:00	53.1	54.1					
		Leq DAY	61.9	63.2					
1	Noise Level dB(A)Leq -Night	22:00-23:00	47.8	47.9	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	39.9					
3		00:00- 01:00	38.5	38.7					
4		01.00-02.00	37.6	37.6					
5		02.00-03.00	36.9	36.9					
6		03.00-04.00	36.4	36.1					
7		04.00-05.00	40.7	41.2					
8		05:00-06:00	41.2	41.1					
		Leq NIGHT	37.2	37.2					

**LDL indicates Lower Detection Limit*

***All noise measurements are integrated for a 01 hour period, All units in dB(A)*

Sampling Assistants
ANALYSED BY

(Gaurav Kant)
REVIEWED BY

(Amit Raj Mishra)
Authorised Signatory

---- End of Report ----

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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

Environment Laboratory, Regional Institute-II

Ambient Noise Level Test Report

Month & Year	**07/ 2024**	**Cluster**	**Cluster I**	**ULR NO.**	**TC1012224000001076F**
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**			**Date of Issue**	**23.09.2024**
Project	**Madhuband Washery**	**Sample Ref. No.**	**REM/BCCL/2024/ 07**	**Sampling Method**	**CMPDI/RI-II/LPM 22**

				Date of Sampling	**15.07.2024**	**30.07.2024**	**Zone Category of Station:**		**Buffer 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	68	68.2	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	55.1	50.2					
3		08:00 - 09:00	53.7	48.9					
4		09:00 – 10:00	69.1	72.9					
5		10:00 - 11:00	61.9	58.4					
6		11:00 - 12:00	55.7	55.7					
7		12:00 - 13:00	61.8	65.6					
8		13:00 - 14:00	63	61.8					
9		14:00 - 15:00	62.7	63.5					
10		15:00 - 16:00	59.2	59.9					
11		16:00 - 17:00	66.5	68					
12		17:00 - 18:00	52.2	51.1					
13		18:00 - 19:00	61.5	62.4					
14		19:00 - 20:00	66.5	67.5					
15		20:00 - 21:00	62.9	63.3					
16		21:00 - 22:00	61.5	62.7					
		Leq DAY	63.6	65.2					
1	Noise Level dB(A)Leq -Night	22:00-23:00	54.8	55.7	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	49.2	49.3					
3		00:00- 01:00	48.7	49					
4		01.00-02.00	48.4	48.6					
5		02.00-03.00	48.2	47.6					
6		03.00-04.00	47.9	47.8					
7		04.00-05.00	52.7	52.7					
8		05:00-06:00	52.9	53.8					
		Leq NIGHT	48.3	48.7					

**LDL indicates Lower Detection Limit*

***All noise measurements are integrated for a 01 hour period, All units in dB(A)*

Sampling Assistants
ANALYSED BY

(Gaurav Kant)
REVIEWED BY

(Amit Raj Mishra)
Authorised Signatory

---- End of Report ----

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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

Environment Laboratory, Regional Institute-II

Ambient Noise Level Test Report

04/2023	07/2024	Cluster	Cluster II	ULR NO.	TC1012224000001076F
Customer	Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)			Date of Issue	23.09.2024
Project	Block – II OCP	Sample Ref. No.	REM/BCCL/2024/ 07	Sampling Method	CMPDI/RI-II/LPM 22

			Date of Sampling	10.07.2024	25.07.2024	Zone Category of Station:		Buffer 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	50.1	50	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	50.9	48.9					
3		08:00 - 09:00	51.9	52.9					
4		09:00 – 10:00	53	54					
5		10:00 - 11:00	55.7	56.2					
6		11:00 - 12:00	56.2	56.5					
7		12:00 - 13:00	57.7	59.1					
8		13:00 - 14:00	63.6	65.5					
9		14:00 - 15:00	66	68					
10		15:00 - 16:00	63	64.8					
11		16:00 - 17:00	63.7	66					
12		17:00 - 18:00	66	69					
13		18:00 - 19:00	68.3	67.1					
14		19:00 - 20:00	66	65.4					
15		20:00 - 21:00	63.6	64.4					
16		21:00 - 22:00	62.3	61.2					
		Leq DAY	62.9	64.0					
1	Noise Level dB(A)Leq -Night	22:00-23:00	59.6	60.1	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	57.5	58.1					
3		00:00- 01:00	52.6	53.5					
4		01.00-02.00	52.3	52.9					
5		02.00-03.00	51.5	51.3					
6		03.00-04.00	53.6	53.3					
7		04.00-05.00	55.4	56.5					
8		05:00-06:00	56.9	57.2					
		Leq NIGHT	52.7	53.0					

**LDL indicates Lower Detection Limit*

***All noise measurements are integrated for a 01 hour period, All units in dB(A)*

Sampling Assistants
ANALYSED BY

(Gaurav Kant)
REVIEWED 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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CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

Environment Laboratory, Regional Institute-II

Ambient Noise Level Test Report

Month & Year	**07/ 2024**	**Cluster**	**CLUSTER I**	**ULR NO.**	**TC1012224000001076F**
Customer	**Environment Department, Bharat Coking Coal Limited (BCCL), Koyla Bhawan, Dhanbad (E-mail: gmenv.bccl@coalindia.in)**			**Date of Issue**	**23.09.2024**
Project	**Regional Hospital Baghmara**	**Sample Ref. No.**	**REM/BCCL/2024/07**	**Sampling Method**	**CMPDI/RI-II/LPM 22**

			Date of Sampling	**09.07.2024**	**24.07.2024**	**Zone Category of Station:**		**Buffer 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	40.5	40.1	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	41.4	42.3					
3		08:00 - 09:00	43.4	43.6					
4		09:00 – 10:00	44.5	43.8					
5		10:00 - 11:00	45.6	48.6					
6		11:00 - 12:00	46.1	47.6					
7		12:00 - 13:00	46.5	44.4					
8		13:00 - 14:00	46.7	49.9					
9		14:00 - 15:00	46.8	47.6					
10		15:00 - 16:00	46.6	43.9					
11		16:00 - 17:00	43.6	43.3					
12		17:00 - 18:00	43.3	43.4					
13		18:00 - 19:00	42.6	45.1					
14		19:00 - 20:00	42.5	42.9					
15		20:00 - 21:00	41.2	42.3					
16		21:00 - 22:00	40.8	39.9					
		Leq DAY	44.4	45.2					
1	Noise Level dB(A)Leq -Night	22:00-23:00	34.5	34.9	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	31.4	31.2					
3		00:00- 01:00	31	30.4					
4		01.00-02.00	30.8	30					
5		02.00-03.00	30.1	30.2					
6		03.00-04.00	33.4	33.7					
7		04.00-05.00	33.1	33.8					
8		05:00-06:00	34.9	34.1					
		Leq NIGHT	31.4	31.2					

**LDL indicates Lower Detection Limit*

***All noise measurements are integrated for a 01 hour period, All units in dB(A)*

Sampling Assistants
ANALYSED BY

(Gaurav Kant)
REVIEWED BY

(Amit Raj Mishra)
Authorised Signatory

---- End of Report ----

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
	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 clause2.

** 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.

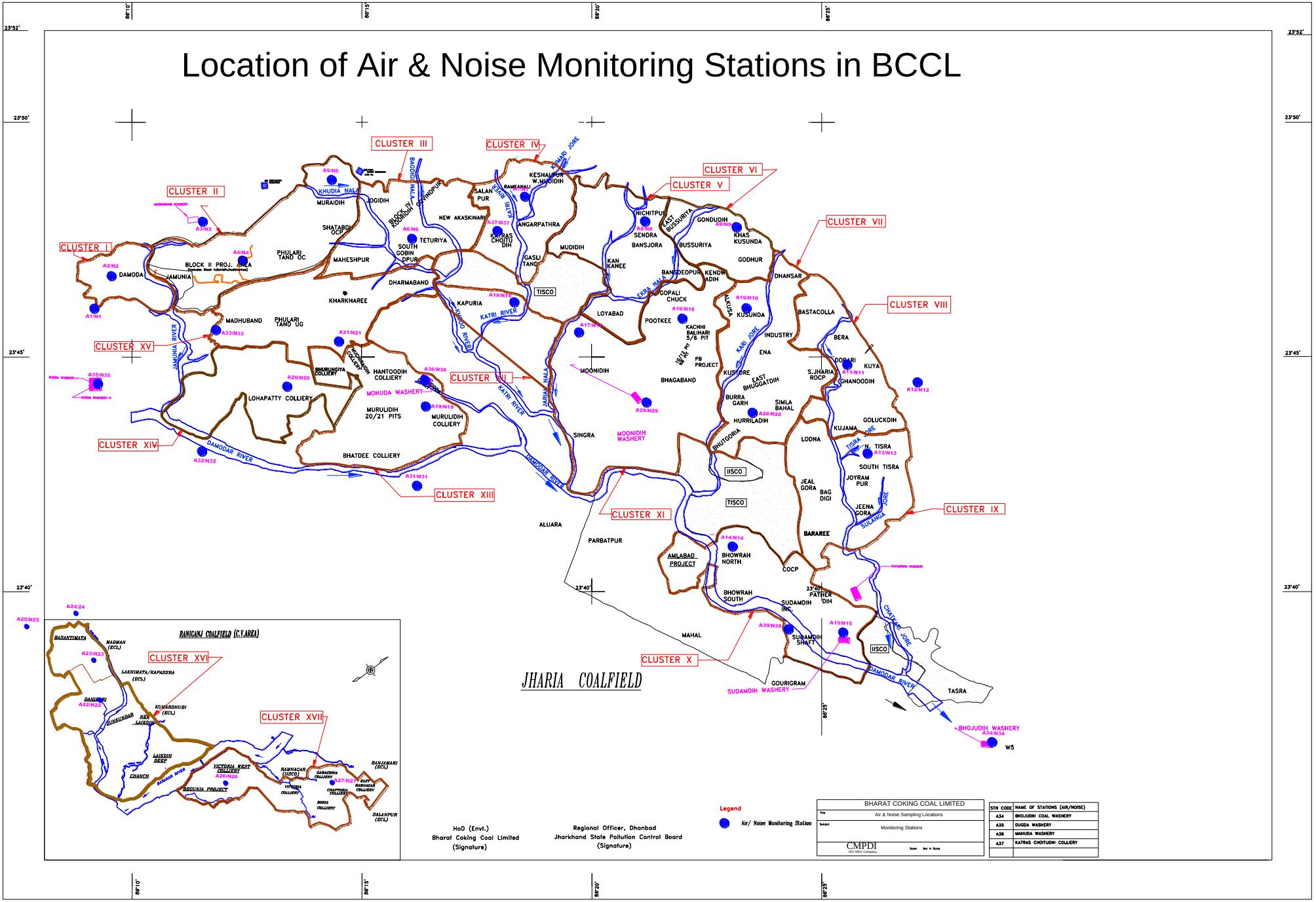
Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
		Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (Notified by Central Government)	
Sulphur Dioxide (SO_2), µg/m³	Annual * 24 Hours **	50 80	20 80	-Improved West and Gaeke Method -Ultraviolet Fluorescence
Nitrogendioxide (NO_2), 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 PM_{10}, 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 (O_3) , 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 (NH_3), µg/m³	Annual * 24 Hours **	100 400	100 400	-Chemiluminescence -Indophenol blue method
Benzene (C_6H_6), 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 byHPLC/GC analysis
Arsenic (As), ng/m³	Annual *	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel (Ni), ng/m³	Annual *	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

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

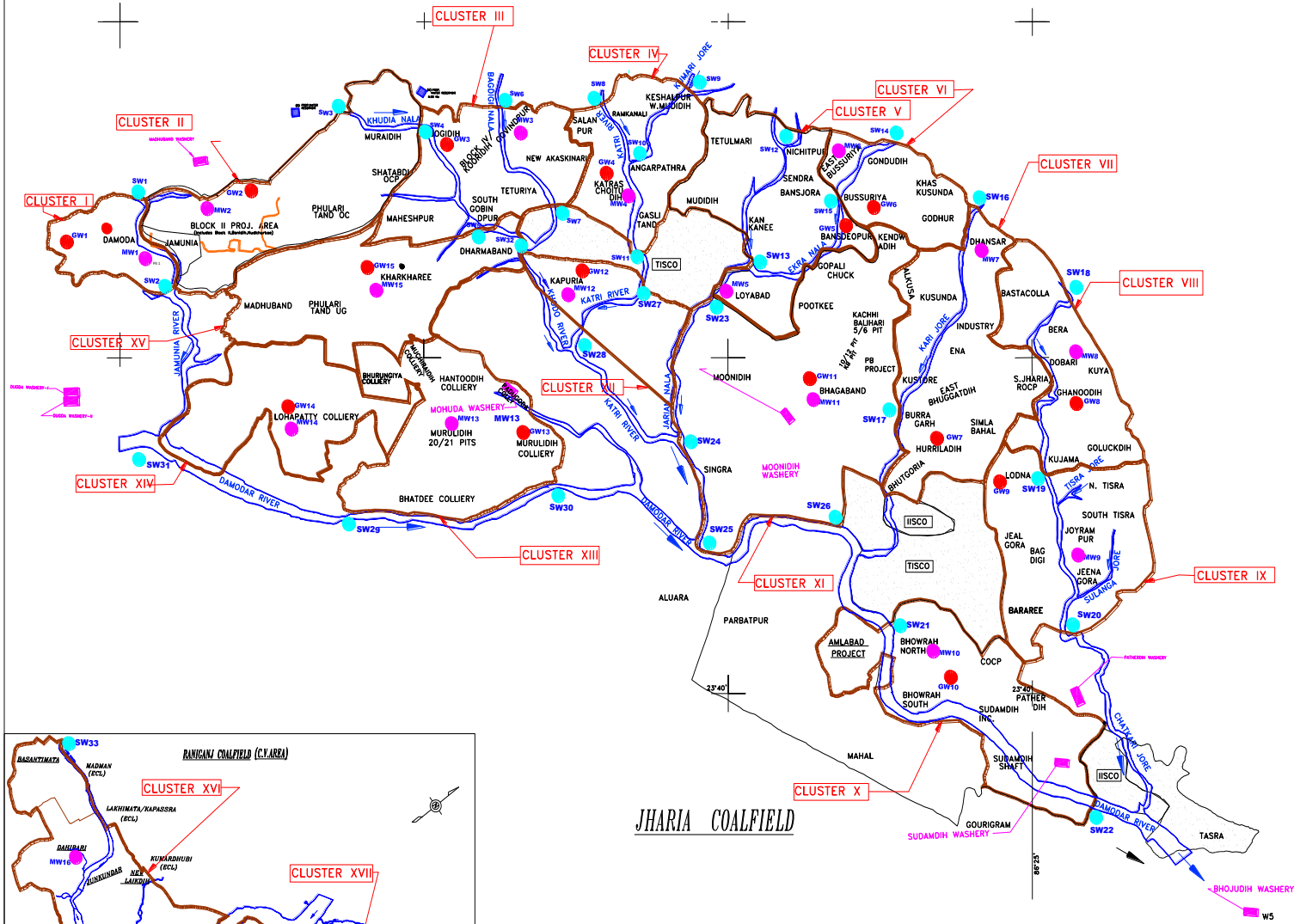
** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

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

Location of Air & Noise Monitoring Stations in BCCL



Water Sampling Locations in BCCL



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

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

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

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

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