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**ENVIRONMENTAL MONITORING REPORT
BALLARPUR OC**

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

**Environment Laboratory
NABL Accredited vide Cert. No. TC-7102**

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Ballarpur OC is located in Chandrapur district of Maharashtra State. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication :

Ballarpur OC project is situated at a distance of approximately 2 KM from Ballarpur City.

Drainage :

The Wardha River is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coalmines, Ballarpur Paper Mill is the major industry in the vicinity of the project area.

Pollution due to other sources :

The above-mentioned sources and the Township are also expected to contribute a lot in increasing the load of pollution in the area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office – Ballarpur UG	- BBOA-1
2.	Premises of SAM Office	- BBOA-2
3.	Substation – Ballarpur OC	- BBOA-3
4.	Filter plant / Colony	- BBOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Weigh Bridge	- BBOAF-1
2.	CHP	BBOAF-2
3.	Railway Siding	BBOAF-3

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- BBOW-1

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- BBON-1
2.	Colony	- BBON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower.

As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.


PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N (1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-35 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED 18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : BALLARPUR OC

Manager office - Ballarpur UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
26/04/2019	219	96	11	15	11
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Premises of Sub area office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
26/04/2019	356	124	55	19	14
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Substation- Ballarpur OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	168	96	34	15	11
Permissible Limits	600	300	60	120	120

Filter plant/ colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
26/04/2019	383	191	57	29	21
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80

Above Std. Value.

FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-


CHP/ Coal Moni. Point			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

Rly Sidding.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-35 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED 18.04.19 Sample Description :Water
 sample
 No. of pages :1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : BALLARPUR OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
25/04/2019	7.2	36	38	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
25/04/2019	7.1	32	30	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : APRIL
NAME OF THE PROJECT : BALLARPUR OCP

Name of the Location : CHP - BBON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	62.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - BBON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	43.2
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

BALLARPUR. UG

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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INTRODUCTION

Location :

Ballarpur - III & IV UG is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication :

Ballarpur - III & IV UG is at a distance of approximately 1.5 KM from Ballarpur City

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coalmines, Ballarpur Paper Mill is the major industry in the vicinity of the project area.

Pollution due to other sources :

The above-mentioned sources and the Township are also expected to contribute a lot in increasing the load of pollution in the area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office – Ballarpur UG	-	BBUA-1
2.	Substation - Ballarpur OC	-	BBUA-2
3.	Filter plant/ Colony/ Guest House	-	BBUA-3
4.	Premises of SAM Office	-	BBUA-4

Water Quality Monitoring Station :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	BBUW-1

Noise Level Monitoring Station :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Fan house	-	BBUN-1
2.	Colony	-	BBUN-2

Frequency of Monitoring :


Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N (1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-36 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2
 Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : BALLARPUR UG

Manager office - Ballarpur UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
26/04/2019	219	96	11	15	11
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Substation- Ballarpur OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	168	96	34	15	11
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Filter plant/ colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
26/04/2019	383	191	57	29	21
Permissible Limits	200	100	60	80	80
# Above Std. Value					


Premises of Sub area office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO_x
26/04/2019	356	124	55	19	14
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

Above Std. Value

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-36A Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : BALLARPUR UG Sampling Date : 25/04/2019
 NAME OF LOCATION : DRINKING WATER FILTER PLANT.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.30	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	308	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	102	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.04	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.72	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	590	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	70.4	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	32.07	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	108	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	19.8	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-36A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	184	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : APRIL
NAME OF THE PROJECT : BALLARPUR-III & IV UG

Name of the Location : Near Fan House - BBUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	72.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - BBUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	43.2
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

GOURI I & II (A) OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

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INTRODUCTION

Location:

Gouri I & II (A) OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication: The project is at a distance of approximately 24 km from Ballarpur City.

Drainage: The Wardha river is the main drainage channel for the surrounding area.

Climate : The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines , there is no other major industries nearby the project area. Vehicular traffic and local coal burning for domestic purposes are other source of pollution.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office - Gouri-I OC	-	BGOA-1
2.	Gouri village	-	BGOA-2
3.	SAM Office – Gouri Sub Area	-	BGOA-3
4.	Gouri Colony/ Filter Plant	-	BGOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	BGOAF-1
2.	Weigh Bridge		BGOAF-2

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge- Gouri I OC	-	BGOW-1
2.	ETP Workshop discharge- Gouri I OC	-	BGOW-2

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	BGON-1
2.	Gouri Colony	-	BGON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower.


As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Effluent water sample is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-34 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NOx(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : GOURI-I & II (A) OCP

Manager Office - Gouri -I O/C					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
22/04/2019	176	53	25	8	6
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Gouri Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
22/04/2019	290	116	24	18	13
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
SAM office – Gouri sub area					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
24/04/2019	177	61	42	10	7
Permissible Limits	600	300	60	120	120
#Above Std. Value					

Gouri colony/ Filter plant					
	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
24/04/2019	123	83	20	13	9
Permissible Limits	200	100	60	80	80

#Above Std. Value

FUGITIVE DUST MONITORING DATA


CHP/coal unloading point			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-34 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520- Sample Description :water
 522 DATED-18.04.19 sample
 No. of pages :1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : GOURI-I & II (A) OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
22/04/2019	7.1	48	46	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
22/04/2019	7.7	40	42	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : APRIL
NAME OF THE PROJECT : GOURI - I & II (A) OCP

Name of the Location : CHP - BGON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	22/04/2019	63.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Gouri Colony - BGON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	43.6
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

GOURI DEEP. OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Gouri Deep OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 25 km from Ballarpur City.

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate : The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines , there is no other major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- BG _D OA-1
2.	Mutra village	- BG _D OA-2
3.	Goyegaon Village	- BG _D OA-3
4.	Antragaon Village	- BG _D OA-4

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- BG _D OW-1

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- BG _D ON-1

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower.

As the air passes through the cyclone, coarse, non-respirable dust (size $>10 \mu$) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

- PM-2.5 :** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x :** Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂ :** Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water :** Effluent water sample is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise :** Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-33 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : GOURI-DEEP OCP

Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	195	64	18	10	7
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Mutra village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	140	50	38	8	6
Permissible Limits	200	100	60	80	80
Goyegaon village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	120	71	60	11	8
Permissible Limits	200	100	60	80	80
# Above Std. Value					


Antargaon village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	311	259	25	39	28
Permissible Limits	200	100	60	80	80

Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-33 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : GOURI DEEP OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
20/04/2019	7.6	36	48	<2
				<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
20/04/2019	7.4	44	58	<2
				<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : APRIL
NAME OF THE PROJECT : GOURI - DEEP OCP

Name of the Location : Manager Office - BG_DON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	20/04/2019	52.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

PAUNI OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
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INTRODUCTION

Location :

Pauni OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 24 km from Ballarpur City .

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines , there is no major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office - Pauni OC	-	BPOA-1
2.	Pauni village	-	BPOA-2
3.	Gouri village	-	BPOA-3
4.	Workshop – Pauni OC	-	BPOA-4

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	BPOW-1
2.	ETP Effluent discharge	-	BPOW-2

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Manager Office	-	BPON-1
2.	Gouri colony	-	BPON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower . As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles.


These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-29 Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : PAUNI OCP

Manager Office - Pauni O/C					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	252	154	25	24	17
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Pauni Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	248	137	54	21	15
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
Gouri Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	290	116	24	18	13
Permissible Limits	200	100	60	80	80
#-Above Std. Value					

Workshop- Pauni OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	150	44	20	7	5
Permissible Limits	600	300	60	120	120


FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-29 Date of Issue : 15/06/2019
Name of the Customer: WCL, NAGPUR
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : APRIL
NAME OF THE PROJECT : PAUNI OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
21/04/2019	7.6	36	34	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
21/04/2019	7.6	48	62	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : APRIL
NAME OF THE PROJECT : PAUNI OCP

Name of the Location : Near Manager Office - BPON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	21/04/2019	51.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Gouri Colony - BPON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	43.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

PAUNI II OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Pauni-II OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 24 km from Ballarpur City .

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines , there is no major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine office - Pauni- II OC	- BP ₂ OA-1
2.	Substation - Pauni- II OC	- BP ₂ OA-2
3.	Workshp	- BP ₂ OA-3
4.	Sakhari village	- BP ₂ OA-4

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- BP ₂ OW-1

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- BP ₂ ON-1

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower . As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles.

These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-32 Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : PAUNI II OCP

Mine Office – Pauni II OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	291	260	57	39	28
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Substation Pauni II OC g					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	110	40	7	6	5
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	150	44	20	7	5
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120


Sakhari Village					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
19/04/2019	241	97	47	33	23
Permissible Limits	200	100	60	80	80

#-Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-29 Date of Issue : 15/04/2019
 Name of the Customer: WCL, NAGPUR
 WCL/HQ/ENV/17-K/520- Sample Description :water
 Customer letter Ref. No. : 522 DATED-18.04.19 sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : PAUNI II OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
22/04/2019	7.9	28	24	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : APRIL
NAME OF THE PROJECT : PAUNI II OCP

Name of the Location : Near Manager Office - BP₂ON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	22/04/2019	53.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT SASTI EXPN. OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

**Environment Laboratory
NABL Accredited vide Cert. No. TC-7102**

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location :

Sasti Opencast Project is located in Chandrapur district of Maharashtra State and is administered by Ballarpur Area of Western Coalfields Limited.

Communication :

The Sasti opencast project can be approached by road from south from Rajura town, which is 172 km from Nagpur. The distance between Sasti OC and Rajura town is about 13 km. Ballarshah railway junction on the Nagpur - Khazipet line of Central Railway is about 12 km by road from Rajura.

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines viz. Gouri OC, Pauni OC, Dhuptala OC, Ballarpur OC & Ballarpur UG, the major industry i.e. Ballarpur Paper Mill is falling within the 10 kms radius of the Sasti OCP.

Pollution due to other sources :

The above mentioned sources are expected to contribute in increasing the load of pollution in the area. Domestic coal burning in the village area also contributes to a lot in increasing the air pollution.

Sampling Locations :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Gouri Colony / Filter Plant	: BSOA-1
2.	Sasti village	: BSOA-2
3.	SAM Office - Sasti OC	: BSOA-3
4.	Area Store Premises	: BSOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Weigh Bridge	- BSOAF-1
2.	Mine CHP	BSOAF-2
3.	Railway Siding	BSOAF-3

Water Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Mine water discharge	BSOW-1
2.	ETP (Workshop) treated water	BS(ETP)W-2
3.	STP (Domestic Effluent) treated water	BS(STP)W-3

Noise Level Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP	- BSON-1
2.	Gouri Colony	- BSON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Water samples are collected on fortnightly basis in plastic zaricane and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Area store					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
25/04/2019	268	150	20	23	16
Permissible Limits	600	300	60	120	120

FUGITIVE DUST MONITORING DATA

Weigh Bridge			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-


Main CHP			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

Rly Siding			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-30 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED 18.04.19 Sample Description : Water sample
 No. of pages : 2

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : SASTI OCP


Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
24/04/2019	7.3	32	34	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
23/04/2019	7.9	28	26	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

S.T.P. (Domestic Effluent) - Treated Water		
Date of Sample Collection	Analysis Results	
	TSS (mg/l) IS-3025/17:1984	BOD (3 days 27°C) mg/l
Below Detection Limit	10	2
24/04/2019	66	11.8
TLV as per Env.(Protection) Amendment rule 2000	100	30

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-30A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED 18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : SASTI OCP Sampling Date : 22/04/2019
 NAME OF LOCATION : DRINKING WATER FILTER PLANT.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.50	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	344	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	72	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.58	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	590	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	76.8	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	36.93	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	118	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	15.12	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-21A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	208	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL
NAME OF THE AREA : BALLARPUR
NAME OF THE PROJECT : SASTI OCP
YEAR : 2019
MONTH : APRIL

Name of the Location : CHP - BSON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	64.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Gouri Colony - BSON-2

Month	Date of Data Collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	43.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

SASTI UG

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

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INTRODUCTION

Location :

Sasti UG is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 20 KM from Ballarpur City.

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines, there is no other major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	SAM office – Dhoptala Sub Area	- BSUA-1
2.	Sasti Colony	- BSUA-2
3.	Sasti Village	- BSUA-3
4.	Manager Office – Dhoptala OC	- BSUA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Main CHP	- BSUF-1

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- BSUW-1

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan house	- BSUN-1
2.	Colony	- BSUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and

Oxides of nitrogen (NO_x) etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-29 Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : SASTI UG


SAM office - Dhoptala sub area					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
26/04/2019	333	113	39	17	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
#Above Std .Value					
Sasti colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	166	110	54	17	12
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
#Above Std .Value					
Sasti village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	242	92	58	14	10
Permissible Limits	200	100	60	80	80
#Above Std .Value					

Manager office – Dhoptala OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
25/04/2019	215	80	40	12	9
Permissible Limits	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-29 Date of Issue : 15/06/2019
Name of the Customer: WCL, NAGPUR
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 2

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH. : APRIL
NAME OF THE PROJECT : SASTI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
24/04/2019	7.4	32	30	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-29A Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 ANAME OF THE PROJECT : SASTI UG Sampling Date : 24/04/2019
 NAME OF LOCATION : DRINKING WATER FILTER PLANT.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.80	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	724	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	90	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.06	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.66	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	1040	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	180.8	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	66.09	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	172	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	16.82	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-29A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	192	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : APRIL
NAME OF THE PROJECT : SASTI UG

Name of the Location : Near Fan House - BSUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	72.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : SASTI Colony - BSUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	43.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

DHOPTALA OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL- 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

New Dhoptala OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 20 KM from Ballarpur City.

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines, there is no other major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office – Dhoptala OC	- BDOA-1
2.	SAM office – Dhoptala Sub Area	- BDOA-2
3.	Sasti Colony	- BDOA-3
4.	Sasti Village	- BDOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- BDOAF-1
2.	Weight Bridge	- BDOAF-2

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- BDOW-1

Noise Level Monitoring Location :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near CHP	- BDON-1
2.	Colony	- BDON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N (1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Due to non-availability, mine water discharge could not be monitored during this month.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-18 Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : NEW DHOPTALA OC

Manager office - Dhoptala OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	215	80	40	12	9
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
SAM office - Dhoptala sub area					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
26/04/2019	333	113	39	17	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Sasti colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	166	110	54	17	12
Permissible Limits	200	100	60	80	80
# Above Std. Value.					

Sasti village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
24/04/2019	242	92	58	14	10
Permissible Limits	200	100	60	80	80

Above Std. Value.

FUGITIVE DUST MONITORING DATA


CHP/coal unloading point			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-18A Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : NEW DHOPTALA OC Sampling Date : 24/04/2019
 NAME OF LOCATION : DRINKING WATER MANAGEROFFICE.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.60	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	396	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	114	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.04	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.74	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	680	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	86.4	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	43.74	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	124	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	12.18	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-36

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	140	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : APRIL
NAME OF THE PROJECT : NEW DHOPTALA OCP

Name of the Location : CHP - BDON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	53.3
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Sastii Colony - BDON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	43.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

BHATADI OC EXPN.

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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INTRODUCTION

Location :

Bhatadi Opencast Project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Climate :

The climate of the area is dry to moist tropical. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electros melt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Bhatadi village	-	CBOA-1
2.	Bhatadi Manager office	-	CBOA-2
3.	Security check post	-	CBOA-3
4.	Kitadi village	-	CBOA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP /MRG loading point	-	CBOAF-1
2.	Weigh Bridge	-	CBOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	CBOW-1
2.	Workshop (ETP) water discharge	-	CBOW-2
3.	STP (Domestic Effluent) treated water-		CBOW-3

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near CHP	-	CBON-1
2.	Colony	-	CBON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Kitadi village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
19/04/2019	162	118	14	18	13
20/04/2019	182	63	35	10	7
29/04/2019	126	46	22	7	5
30/04/2019	85	68	52	11	8
Permissible Limits	200	100	60	80	80

Above Std .value

FUGITIVE DUST MOITORING DATA

1. CHP/MRG loading point

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
30/04/2019	364	258	47

2. Weigh Beidge


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
29/04/2019	283	180	56

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-18 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED: 18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : BHATADI OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.42	28	26	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
ETP (Workshop) - Treated water sample				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.37	40	18	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
S.T.P. (Domestic Effluent) - Treated Water				
Date of Sample Collection	Analysis Results			
	TSS (mg/l) IS-3025/17:1984		BOD (3 days 27°C) mg/l	
Below Detection Limit	10		2	
19/04/2019	36		12	
TLV as per Env.(Protection) Amendment rule 2000	100		30	

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : BHATADI OC

Name of the Location **CHP - CBON-1**

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	63.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - **CBON-2**

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	43.4
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

CHANDA RAYATWARI UG

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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4.	DRINKING WATER QUALITY MONITORING DATA	6-7
5.	NOISE LEVEL DATA	8

INTRODUCTION

Location :

Chanda-Rayatwari Colliery is located in the Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Communication : Chanda-Rayatwari Colliery is very close to the Chandrapur city.

Climate :

The climate of the area is dry to moist tropical with well-defined summer from April to June, rainy season from July to September and winter from December to February. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electromelt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office (Mahakali UG)	-	CC _R UA-1
2.	Substation - CRC	-	CC _R UA-2
3.	Colony	-	CC _R UA-3
4.	Jatwara milk scheme	-	CC _R UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	CC _R UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	CC _R UN-1
2.	Colony	-	CC _R UN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

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- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-19 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED: 18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : CHANDA RAYATWARI UG

Manager's office- Mahakali UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	154	47	27	7	5
Permissible Limits	600	300	60	120	120
CRC Substation / Filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	263	104	46	16	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	194	92	36	14	10
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
#-Above std.value					


Jatwara milk scheme					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
27/04/2019	175	116	53	18	13
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

#-Above std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p style="text-align: center;">Test Report</p>	
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Test Report NO : RIN/TR/APRIL-19/W-19 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED: 18.04.19 Sample Description : Water sample
 No. of pages : 2

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : CRC UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
26/04/2019	7.43	36	20	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-19A Date of Issue : 15/06/2019
 Name of the Customer: Env.CMPDI,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED: 18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : CRC UG Sampling Date : 26/04/2019
 NAME OF LOCATION : DRINKING WATER FILTER PLANT.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.20	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	188	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	108	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.74	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	440	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	50	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	15	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	0.032	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	113	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	16	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-19A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	176	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : CHANDA-RAYATWARI UG

Name of the Location :CHP –: CC_RUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	63.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location :Colony - CC_RUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	42.7
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

DURGAPUR RAYATWARI UG

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory

NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

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4.	DRINKING WATER QUALITY MONITORING DATA	6-7
5.	NOISE LEVEL DATA	8

INTRODUCTION

Location :

Durgapur-Rayatwari Underground Project is located in Chandrapur District of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Communication :

Durgapur-Rayatwari Underground Project is situated on bye-pass link road at a distance of 4 Kms (approx) from Chandrapur city.

Drainage :

The drainage of the area is controlled by Erai River, which flows from North to South.

Climate : The climate of the area is dry to moist tropical. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry : Other than the coal mines, Chandrapur Super Thermal Power Station and Maharashtra Electrosmelt Limited are the major industries, which fall in the vicinity of Durgapur Rayatwari Underground Project.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Pit office, DRC-III UG	-	CD _R UA-1
2.	DRC-V colony	-	CD _R UA-2
3.	Nehru Nagar-Substation	-	CD _R UA-3
4.	Filter plant DOC/POC Colony		

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	CD _R UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Pit office of DRC-III UG	-	CD _R UN-1
2.	Colony (Durgapur)		CD _R UN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

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- Noise** : Noise level data are recorded fortnightly.


Filter plant DOC/POC Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
28/04/2019	237	194	42	30	21
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80

Above Std. value

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/A-21 Date of Issue : 15/06/2019
Name of the Customer: WCL,Nagpur
WCL/HQ/ENV/17-
Customer letter Ref. No. : K/520-522 DATED-
18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : DRC UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
27/04/2019	7.10	32	22	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-21A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : DRC UG Sampling Date : 27/04/2019
 NAME OF LOCATION : DRINKING WATER FILTER PLANT.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.50	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	232	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	70	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.46	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	390	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	54	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	23	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	65	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	7	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-21A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	148	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : DURGAPUR-RAYATWARI UG

Name of the Location : Pit office of DRC-III UG : CD_RUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	72.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location :Durgapur Colony - CD_RUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	43.4
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

DURGAPUR OC EXPN.

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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DURGAPUR OCP

Location :

The Durgapur opencast project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur area of Western Coalfields Limited.

Communication :

Chandrapur town, the district headquarter of Chandrapur district, is only 6 km south of the project. The project is approachable via Chandrapur - Tadoba road and also Chandrapur - Mul road. The Chandrapur railway station is about 5 km from this project, which lies on Nagpur-Chennai broad gauge line of Central Railway.

Drainage :

The drainage of the area is controlled by two seasonal tributaries (Motaghat nalla and Upasa nalla) of Erai river, which flows west of the area.

Climate :

Climate of the area is dry to moist tropical with well-defined summer from April to June, rainy season from July to September and winter from December to March. In summer temperature goes up to a maximum of 48°C whereas in winter temperature generally falls to a minimum of 10°C. Average annual rainfall is about 1200mm.

Industry :

Padmapur OCP, Chandrapur STPS and Maharashtra Electro Smelter are the major industries, which fall in the vicinity of the Durgapur OCP.

Pollution due to other sources :

The above-mentioned industries specially the Super Thermal Power Station are likely to contribute in increasing the air pollution of nearby villages. Durgapur village has been affected maximum due to proximity of the thermal powerhouse.

Sampling Locations :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>		<u>Code No.</u>
1.	Durgapur village	-	CDOA-1
2.	Filter plant DOC/ POC	-	CDOA-2
3.	Sinhala village	-	CDOA-3
4.	Manager Office, Sec- V	-	CDOA-4

Fugitive Dust Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>		<u>Code No.</u>
1.	Checkpoint/ Ayyappa mandir	-	CDOA-1
2.	CHP	-	CDOA-2

Water Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Mine water discharge- Q-IV	- CDOW-1
2.	Mine water discharge – Q-II	- CDOW-2
3.	ETP (Workshop) treated water	- CD(ETP)W-3
4.	STP (Domestic Effluent) treated water	- CD(STP)W-4

Noise Level Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP	- CDON-1
2.	Durgapur Colony	- CDON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected once in each fortnight in a month with APM 451 Respirable dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended Particulate Matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable dust sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass micro fiber filter paper. The Respirable dust (**PM-10**) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of Oxides of Nitrogen is based on the procedure of "**Jacobs and Hochheiser method**". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl)

ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of **West and Gaeke method**. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphito-mercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Water samples are collected from prefixed locations in plastic zaricanes and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Day time and Night time Noise level data are recorded fortnightly.

Manager's office-Sector V					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
28/04/2019	289	206	69 [#]	31	22
Permissible Limits	600	300	60	120	120

FUGITIVE DUST MOITORING DATA

1. Check post / Ayyappa Mandir

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
28/04/2019	313	231	57

2. CHP


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
30/04/2019	328	262	40

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-22 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED: 18.04.19 Sample Description : Water sample
 No. of pages : 2

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : DURGAPUR OCP


Mine water discharge Q IV				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.2	44	32	<2
TLV as per Env.(Pr23/otection) Amendment rule 2000	5.5 - 9.0	250	100	10
Mine water discharge Q V/VI				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.6	36	30	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	6.9	32	28	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

S.T.P. (Domestic Effluent) - Treated Water		
Date of Sample Collection	Analysis Results	
	TSS (mg/l) IS-3025/17:1984	BOD (3 days 27°C) mg/l
Below Detection Limit	10	2
19/04/2019	40	12.6
TLV as per Env.(Protection) Amendment rule 2000	100	30

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-22A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED: 18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : NANDGAON UG Sampling Date : 26/04/2019
 NAME OF LOCATION : DRINKING WATER FILTER PLANT.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.70	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	176	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	50	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.53	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	300	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	38	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	19	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	0.021	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	45	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	8	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-22A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	120	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH. : APRIL
 NAME OF THE PROJECT : DURGAPUR OCP

Name of the Location		CHP	CDON 1
Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	
APRIL.2019	19/04/2019	64.6	
Noise Level Standard as per Env. (Protection) Amendment rule 2000			75

Name of the Location :Durgapur Colony - CDON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	43.4
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT
HINDUSTAN LALPETH I & III UG
(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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INTRODUCTION

Location :

Hindustan Lalpeth -I & III Underground Projects are located in Chandrapur district of Maharashtra State and are administered by Chandrapur Area of Western Coalfields Limited.

Communication : The projects are situated near bye-pass link road in Chandrapur city.

Drainage :

Erai river acts as the main drainage of the area which flows from North to South and meets Wardha river.

Climate :

The climate of the area is dry to moist tropical. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, Maharashtra Electros melt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of Hindustan Lalpeth UG Project.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Sub-station - Hindustan Lalpeth Colliery-I UG	- CHUA-1
2.	Pit office HLC – I Incline	- CHUA-2
3.	HLC III Colony	- CHUA-3
4.	Babupeth Area / Rajiv Gandhi Engg. College	- CHUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge – HLP I UG	- CHUW-1
2.	Mine water discharge – HLP III UG	- CHUW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan House– HLP I UG	- CHUN-1
2.	Colony	- CHUN-2

Frequency of Monitoring :


- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM),

Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N (1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-23 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED: 18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : HINDUSTAN LALPETH-I & III UG

Substation- HLC I UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	314	203	19	31	22
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Pit office - HLC-I incline					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	297	140	56	36	26
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
HLC - III colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	219	135	36	21	15
Permissible Limits	200	100	60	80	80


Rajiv Gandhi Engg. College					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
28/04/2019	149	32	20	5	4
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80

Above Std. value.

(Scientific Assistant)

Deepanshu Sahu
(Authorizd Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-22 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED: 18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : HLP-I & III UG

Mine water discharge HLP I UG				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
23/04/2019	7.0	36	20	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
Mine water discharge HLP III UG				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
27/04/2019	6.7	28	24	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorizd Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-23A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : HLP-I & III UG Sampling Date : 27/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.40	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	200	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	88	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.56	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	370	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	51	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	17	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	49	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	17	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-23A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	220	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : HLP I & III UG

Name of the Location :Near Fan House – HLP I UG : CHUN 1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	64.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location :Colony - CHUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	42.6
Permissible Limit		55

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**ENVIRONMENTAL MONITORING REPORT
EXPN OF HINDUSTAN LALPETH OC
(CHANDRAPUR AREA)**

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Hindustan Lalpeth Opencast Project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Communication : This project is situated in the Municipal Area of Chandrapur city.

Drainage :

Erai river acts as the main drainage of the area which flows from North to South and meets Wardha river.

Climate :

The climate of the area is dry to moist tropical. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, Maharashtra Electros melt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of Hindustan Lalpeth Opencast Project.

Pollution due to other sources :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	VTC	- CHOA-1
2.	Between phase I & II seasonal mine	- CHOA-2
3.	Colony (Nandgaon)	- CHOA-3
4.	Mana Village	- CHOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Weigh Beidge	- CHOAF-1
2.	Main CHP	- CHOAF-2
3.	RLY Siding	- CHOAF-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- CHOW-1
2.	Workshop (ETP) water discharge	- CHO(ETP)W-2

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- CHON-1
2.	Colony	- CHON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, mine water discharge are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule. Due to non-availability of mine water discharge, mine water sample could not be analysed from this project during this quarter.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/A-24 Date of Issue : 16/06/2019
 Name of the Customer: WCL,Nagpur Sampling method : IS-5182
 WCL/HQ/ENV/17-
 Customer letter Ref. No. : K/520-522 DATED- Sample Description : Airsample
 18.04.19 No. of pages : 2
 Test Required : IS-5182 [PM-10(04:1999), NOx(06:2006), SO₂(02:2001)],PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : HINDUSTAN LALPETH OCP

HLOC- VTC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
-	-	-	-	-	-
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
# Above Std .value					
Between ph I & II seasonal mine					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
28/04/2019	337	193	14	29	21
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

Above Std .value

Colony(Nandgaon)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
29/04/2019	217	124	50	19	14
Permissible Limits	200	100	60	80	80

Mana village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
30/04/2019	240	123	38	34	24
Permissible Limits	200	100	60	80	80

Above Std .val

FUGITIVE DUST MONITORING DATA

1. Weigh Bridge

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

2. Main CHP

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

3. Rly Siding


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
20/04/2019	243	217	37

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-24A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-16.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : HLP OC Sampling Date : 27/04/2019
NAME OF LOCATION : DRINKING WATER FROM MANAGER OFFICE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.60	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	216	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	80	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.96	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	375	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	43	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	23	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	54	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	19	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-24A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	200	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : HLP OCP

Name of the Location : CHP : CHON 1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	64.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location :Colony - CHON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	43.4
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

MAHAKALI UG
(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
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CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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MAHAKALI UNDERGROUND PROJECT

Location :

Mahakali Underground Project is located in Chandrapur District of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Climate :

The climate of the area is dry to moist tropical with well-defined summer from April to June, rainy season from July to September and winter from December to MARuary. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electros melt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office (Mahakali UG)	- CMUA- 1
2.	Substation - CRC	- CMUA- 2
3.	Colony	- CMUA- 3
4.	Jatwara milk scheme	- CMUA- 4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- CMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- CMUN-1
2.	Colony	- CMUN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (RPM), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size $>10\ \mu$) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10\ \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (RPM) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-20 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED: 18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NOx(06:2006), SO₂(02:2001)],PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : MAHAKALI UG

Manager's office- Mahakali UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
30/04/2019	154	47	27	7	5
Permissible Limits	600	300	60	120	120
CRC Substation / Filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
27/04/2019	263	104	46	16	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
29/04/2019	194	92	36	14	10
Permissible Limits	200	100	60	80	80
#-Above std.value					


Jatwara milk scheme					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
27/04/2019	175	116	53	18	13
14TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

#-Above std.value

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-20 Date of Issue : 15/06/2019
 Name of the Customer : WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED: 18.04.19 Sample Description : Air sample
 No. of pages : 2

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : MAHAKALI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
26/04/2019	7.6	36	32	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : MAHAKALI UG

Name of the Location :Near Fan House –: CMUN 1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	69.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location :Colony - CMUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	43.2
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

MANA UG
(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	3-4
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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Mana Underground Project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Climate :

The climate of the area is dry to moist tropical with well-defined summer from April to June, rainy season from July to September and winter from December to MARuary. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electroselt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager's office	- CM _N UA-1
2.	Sub-station of Manna Incline	- CM _N UA-2
3.	Colony (Nandgaon)	- CM _N UA-3
4.	Manna village	- CM _N UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- CM _N UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan house	- CM _N UN-1
2.	Colony (HLOC)	- CM _N UN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** 24 hourly air samples are collected Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air

passes through the cyclone, coarse, non-respirable dust (size $>10 \mu$) is separated from the air stream by centrifugal forces acting on the solid particles.

These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.


- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Mana village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
30/04/2019	240	123	38	34	24
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-22 Date of Issue : 15/06/2019
Name of the Customer: WCL, Nagpur
Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
522 DATED: 18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : MANNA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
29/04/2019	7.3	28	16	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : MANNA UG

Name of the Location :Near Fan House -: CM_NUN 1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	68.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location :Colony - CM_NUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	43.2
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

NANDGAON UG

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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5.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Nandgaon Underground Project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Climate :

The climate of the area is dry to moist tropical with well-defined summer from April to June, rainy season from July to September and winter from December to MARuary. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electros melt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager office – Nandgaon UG	-	CNUA-1
2.	Colony	-	CNUA-2
3.	Sub-station - Manna Incline	-	CNUA-3
4.	Mana Village	-	CNUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	CNUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	CNUN-1
2.	Colony (HLOC)	-	CNUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles.


These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size 10μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-22 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED: 18.04.19 Sample Description : Air sample
 No. of pages : 2
 Test Required : IS-5182 [PM-10(04:1999), NOx(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : NANDGAON UG

Manager's office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
29/04/2019	129	87	25	14	10
Permissible Limits	600	300	60	120	120
Colony(Nandgaon)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
29/04/2019	217	124	50	19	14
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
Substation - Mana incline					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
30/04/2019	283	121	9	19	13
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
# Above Std .value					

Mana village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
30/04/2019	240	123	38	34	24
Permissible Limits	200	100	60	80	80

Above Std .value

(Scientific Assistant)

Deepanshu Sahu
(Authorised signatory)

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Environment Laboratory
CMPDI, RI IV, Nagpur

Test Report



Test Report NO : RIN/TR/APRIL-19/W-22 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED: 18.04.19 Sample Description : Air sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : NANDGAON UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
27/04/2019	6.6	40	36	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-26A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : NANDGAON UG Sampling Date : 26/04/2019
NAME OF LOCATION : DRINKING WATER FILTER PLANT.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.90	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	500	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	124	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.65	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	750	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	101	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	55	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	101	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	12	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-26A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	176	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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 3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
NAME OF THE PROJECT : NANDGAON UG

Name of the Location :Near Fan House -: CNUN 1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	71.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location :Colony - CNUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	43.2
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

PADMAPUR OC EXPN.

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory

NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014**

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INTRODUCTION

Location

Padmapur opencast project is located in Chandrapur district of Maharashtra state and is administered by Chandrapur area of Western Coalfields Limited.

Communication :

The project is situated 8 km away from Chandrapur city. The nearest railway station is Chandrapur (on Chennai-Delhi line about 7 km from the project).

Drainage :

The drainage of the area is controlled by Erairiver, (which flows to the west of the project) and Motaghatnalla, a seasonal tributary of Erai river, (which flows across the central part of the leasehold area of the project).

Climate :

Climate of the area is dry to moist tropical, temperature rising to a maximum of 48°C. during summer and falling to a minimum of 10°C during winter. Average annual rainfall is about 1200mm.

Other Industry :

Durgapur opencast project, Chandrapur Super Thermal Power Station (STPS) and Maharashtra Electro Smelter (MES) are the major industry, which fall in the vicinity of the project area.

Pollution due to other sources :

The above-mentioned industries viz; STPS and MES are likely to contribute in increasing the pollution load of area. Roadway dust is also causing lot of pollution in village area.

Sampling Locations:

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Manager's office	- CPOA-1
2.	Filter plant DOC / POC	- CPOA-2
3.	Kitadi village	- CPOA-3
4.	Manager Office, Sec- V	- CPOA-4

Fugitive Dust Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP/MGR loadingpoint	- CPOAF-1
2.	Weigh Bridge	- CPOAF-2

Water Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Mine water discharge - Q –IV	- CPOW-1
2.	Mine water discharge- Q –III	- CPOW-2
3.	ETP (Workshop) treated water	- CP(ETP)W-3

Noise Level Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP	- CPON-1
2.	Colony (Durgapur)	- CPON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected once in each fortnight in a month with APM 451 Respirable dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended Particulate Matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable dust sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size > 10 micron) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass micro fiber filter paper. The Respirable dust (**PM-10**) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


NO_x : Determination of Oxides of Nitrogen is based on the procedure of "**Jacobs and Hochheiser method**". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of

Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of **West and Gaekemethod**. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphito-mercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Water samples are collected from prefixed locations in plastic zaricanes and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-27 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED: 18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)] ,PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 MNAME OF THE PROJECT : PADMAPUR OCP

Manager office/Substation Q-IV					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	NO _x	SOX	PM-2.5
20/04/2019	258	120	39	18	13
LV as per Env.(Protection) Amendment Rule 2000	600	300	120	120	60
Filter plant DOC/POC Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	NO _x	SOX	PM-2.5
28/04/2019	237	194	42	30	21
Permissible Limits	200	100	80	80	60
#-Above Std. Valu					
Kitadi village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	NO _x	SOX	PM-2.5
19/04/2019	162	118	14	18	13
20/04/2019	182	63	35	10	7
29/04/2019	126	46	22	7	5
30/04/2019	85	68	52	11	8
Permissible Limits	200	100	80	80	60

#-Above Std. Value					
Manager's office-Sector V					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	NOx	SOX	PM-2.5
28/04/2019	289	206	69#	31	22
TLV as per Env.(Protection) Amendment Rule 2000	600	300	120	120	60

FUGITIVE DUST MOITORING DATA

1. CHP/MRG loading point

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

2. Weigh Beidge


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-27 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED: 18.04.19 Sample Description : Air sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR: 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : APRIL
 NAME OF THE PROJECT : PADMAPUR OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.4	48	26	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
ETP (Workshop) - Treated water sample				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	6.6	40	24	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH. : APRIL
NAME OF THE PROJECT : PADMAPUROCP

Name of the Location : **CHP** CPON 1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	64.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location :Durgapur Colony- CPON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	43.4
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

DHORWASA OC EXPN.

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Dhorwasa OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

The Project is well connected by rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line about 6 kms away from the project.

Drainage :

The Wardha River is the main drainage channel for the surrounding area. A few seasonal nullahs drain the rainwater from the Area into Wardha River.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Telwasa security office	- MDOA-1
2.	Dhorwasa village	- MDOA-2
3.	Ekta Nagar Colony	- MDOA-3
4.	R.C. Office	- MDOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- MDOW-1
2	DETP(Ekta Nagar) water discharge	- MDOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Project Office	- MDON-1
2.	Ekta Nagar Colony	- MDON-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

- nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Effluent water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Due to non-availability, mine water discharge could not be monitored during this month.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-55 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 NAME OF THE PROJECT : DHORWASA OC


Telwasa security office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
25/04/2019	255	117	25	18	13
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Dhorwasa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
26/04/2019	244	88	35	14	10
Permissible Limits	200	100	60	80	80
Ekta Nagar colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
24/04/2019	195	85	30	22	16
Permissible Limits	200	100	60	80	80
#-Above Std. Value					

RC office					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NOx	SOx
26/04/2019	130	67	32	11	8
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-55 Date of Issue : 15/06/2019
Name of the Customer: WCL, Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : APRIL
NAME OF THE PROJECT : DHORWASA OC

S.T.P. (Domestic Effluent) - Treated Water		
Date of Sample Collection	Analysis Results	
	TSS (mg/l) IS-3025/17:1984	BOD (3 days 27°C) mg/l
Below Detection Limit	10	2
24/04/2019	40	10
TLV as per Env.(Protection) Amendment rule 2000	100	30

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : APRIL
NAME OF THE PROJECT : DHORWASA OCP
Name of the Location : Near Manager Office – MDON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	44.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Ekta Nagar Colony - MDON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	44.5
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

JUNA KUNADA OCP

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
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INTRODUCTION

Location :

Juna Kunada OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

Juna Kunada OC Project is well connected by both rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line.

Drainage :

The Wardha River is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Pit Office– Juna Kunada OC	MJOA-1
2.	Ekta Nagar Colony	MJOA-2
3.	Chargaon Intake Well	MJOA-3
4.	Chargaon SAM Office	MJOA-4

Fugitive Dust Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Rly siding	MJOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	MJOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Project Office	MJON-1
2.	Ekta Nagar Colony	MJON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower.
As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-54 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 NAME OF THE PROJECT : JUNA KUNADA OCP

Pit Office JKOC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	195	99	26	15	11
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Ekta Nagar colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	195	85	30	22	16
Permissible Limits	200	100	60	80	80
SAM office Chargaon					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	168	89	49	14	10
Permissible Limits	600	300	60	120	120
<i># Above Std. value.</i>					

Chargaon Intake well					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
25/04/2019	80	70	30	11	8
Permissible Limits	600	300	60	120	120

Above Std. value.

FUGITIVE DUST MONITORING DATA

1.Chargaon CHP			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

Scientific Assistant)

**Deepanshu Sahu
 (Authorized Signatory)**

Note: 1) This Report refers to the values related to the items tested as received.
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : APRIL
NAME OF THE PROJECT : JUNA KUNADA OCP

Name of the Location : Manager office - MJON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	46.4
Permissible Limit		75

Name of the Location : Ekta Nagar Colony - MJON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	43.3
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

NAVIN KUNADA EXPN. OC
(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Navin Kunada OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

Navin Kunada OC Project is well connected by both rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line.

Drainage :

The Wardha River is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chargaon Intake well Near	MNOA-1
2.	Ekta Nagar colony	MNOA-2
3.	Near Deulwada village	MNOA-3
4.	Chargaon SAM Office	MNOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	MNOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Project Office/CHP	MNON-1
2.	Ekta Nagar Colony	MNON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air

passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Due to non-availability, mine water discharge could not be monitored during this month.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-53 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 NAME OF THE PROJECT : NAVIN-KUNADA OCP

Chargaon Intake well					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	80	70	30	11	8
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Ekta Nagar colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	195	85	30	22	16
Permissible Limits	200	100	60	80	80
Near Deulwada village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	271	85	16	13	9
Permissible Limits	200	100	60	80	80

#-Above Std Value.

SAM Office Chargaon					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
25/04/2019	168	89	49	14	10
Permissible Limits	600	300	600	120	120

#-Above Std Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : APRIL
NAME OF THE PROJECT : NAVIN-KUNADA OCP

Name of the Location : Chargaon CHP - MNON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	53.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Ekta Nagar Colony- MNON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	43.3
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI-II(A) OC EXPN.

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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4	DRINKING WATER QUALITY MONITORING DATA	6-7
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INTRODUCTION

Location :

New Majri (A) OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

The Project is well connected by both rail & road communication. New Majri railway station, about 2 kms away is the nearest railway station. Project is about 175 km away from Nagpur, on Wardha - Kazipeth line of Central Railway.

Drainage :

The Wardha river is the main drainage channel for the surrounding area. The Konda and Sirna nalla flowing to the North and East of the New Majri area discharge into the Wardha River.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	NMOC Substation	-	MMOA-1
2.	Patala Magazine	-	MMOA-2
3.	Kuchna colony	-	MMOA-3
4.	Majri Basti	-	MMOA-4

Fugitive Dust Monitoring locations :

1.	Field Maint.Shed at Sec	-	MMOAF-1
2.	NMOC CHP	-	MMOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	MMOW-1
2.	Workshop (ETP) water discharge	-	MMOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Field main. Shed	-	MMON-1
2.	Colony	-	MMON-2


Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

- Water** : Water quality is monitored on fortnightly basis.
Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Water samples are collected on fortnightly basis in plastic zaricane and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-56 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 NAME OF THE PROJECT : NEW MAJRI (A) OCP

NMOC Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	59	54	13	9	6
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Patala Magazine					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	379	152	49	23	16
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Kuchana Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	172	71	47	11	8
Permissible Limits	200	100	60	80	80

Primary Health Center, Majri Basti					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	89	31	29	5	4
Permissible Limits	200	100	60	80	80

Above Std. Value

FUGITIVE DUST MONITORING DATA


1.Field Maint.Shed at Sec			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
23/04/2019	395	285	58

2.NMOC CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 T - 2969
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Test Report NO : RIN/TR/APRIL-19/W-56 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 NAME OF THE PROJECT : NEW MAJRI(A) OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
22/04/2019	7.50	24	60	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
22/04/2019	7.20	28	32	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-56A Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJR MONTH : APRIL
 NAME OF THE PROJECT : NEW MAJRI(A) OC Sampling Date : 22/04/2019
 NAME OF LOCATION : DRINKING WATER SAM OFFICE.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.90	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	248	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	50	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.05	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.66	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	482	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	51.2	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	29.28	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	112	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	16	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-56A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	220	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

-
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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI UG to OC

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

New Majri UG to OC Project is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

Project is well connected by both rail & road communications. New Majri railway station is the nearest railway station.

Drainage :

The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	NMOC Substation	-	MMUA-1
2.	Kuchana Colony	-	MMUA-2
3.	Patala Magazine	-	MMUA-3
4.	Manager Office- UG to OC	-	MMUA-4

Fugitive Dust Monitoring locations :

1.	Rly. Siding	-	MMUAF-1
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Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	MMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house, New Majri UG	-	MMUN-1
2.	Colony	-	MMUN-2

Frequency of Monitoring :


Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulate enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulate passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Due to non-availability, mine water discharge could not be monitored during this month.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-49 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 NAME OF THE PROJECT : NEW MAJRI-UG to OC

NMOC Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	59	54	13	9	6
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Kuchana Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	172	71	47	11	8
Permissible Limits	200	100	60	80	80
Patala Magazine					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	379	152	49	23	16
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
# Above Std. Value.					

New Majri UG to OC- Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
24/04/2019	135	109	50	17	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

Above Std. Value

FUGITIVE DUST MONITORING DATA

1.Rly. Siding			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-49 Date of Issue : 15/06/2019
Name of the Customer: WCL, Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : APRIL
NAME OF THE PROJECT : NEW MAJRI UG to OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
23/04/2019	7.60	24	44	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-49A Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 NAME OF THE PROJECT : NEW MAJRI UG to OC Sampling Date : 22/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.40	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	220	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	80	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.90	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	464	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	64	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	14.64	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	77	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	12	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-49A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	200	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : APRIL
NAME OF THE PROJECT : NEW MAJRI UG TO OC
Name of the Location : Fan House (New Majri UG) - MMUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	45.0
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

TELWASA OC EXPN.

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location :

Telwasa OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

The Telwasa OC Project is well connected by rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line about 6 kms away from the project.

Drainage :

The Wardha River is the main drainage channel for the surrounding area. A few seasonal nullahs drain the rainwater from the Area into Wardha River.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Telwasa security Office	-	MTOA-1
2.	SAM Office	-	MTOA-2
3.	Chargaon village	-	MTOA-3
4.	Ekta Nagar Colony	-	MTOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1	Ground StockYard	-	MTOA-1
2.	Weigh Bridge	-	MTOA-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	MTOW-1
2.	Workshop (ETP) water discharge	-	MTOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Project Office	-	MTON-1
2.	Ekta Nagar Colony	-	MTON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

- Water** : Water quality is monitored on fortnightly basis.
Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Ekta Nagar colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SOx
24/04/2019	195	85	30	22	16
Permissible Limits	200	100	60	80	80

#-Above Std.Value

FUGITIVEDUSTMONITORING DATA

1. Ground stock yard (24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-


2. Weigh Bridge (24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-52A Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 NAME OF THE PROJECT : TELWASA OC Sampling Date : 24/04/2019
 NAME OF LOCATION : DRINKING WATER SAMOFFICE.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	3	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.30	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	228	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	62	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.64	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	424	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	48	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	26.35	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	63	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	21.03	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-52A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminc	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	236	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

-
- Note: 1) This Report refers to the values related to the items tested as received.
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3) * - Test parameter not under NABL scope.
-

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2018
NAME OF THE AREA : MAJRI MONTH : APRIL
NAME OF THE PROJECT : TELWASA OCP

Name of the Location : Pit offic - MTON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	46.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Ekta Nagar Colony - MTON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	43.3
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

YEKONA I & II OC .

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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INTRODUCTION

Location :

Yekona I & II OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

The Project is well connected by rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line.

Drainage :

The Wardha River is the main drainage channel for the surrounding area. A few seasonal nullahs drain the rainwater from the Area into Wardha River.

Climate :

The climate of the area is tropical. May is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Panzurni Village	- MYOA-1
2.	Ashti village	- MYOA-2
3.	Sansakar Bharti School	- MYOA-3
4.	Pit Office	- MYOA-4

Water Quality Monitoring location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- MYOW-1

Noise Level Monitoring location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Pit Office	- MYON-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air

passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles.

These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.


PM-2.5: Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-57 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 NAME OF THE PROJECT : YEKONA I & II OC

Penzurni Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	86	28	28	5	3
Permissible Limits	200	100	60	80	80
#-Above Std. Value.					
Ashit Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	51	45	24	7	5
Permissible Limits	200	100	60	80	80
#-Above Std. Value.					
Sanskar Bharti					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	196	97	34	16	12
Permissible Limits	200	100	60	80	80
#-Above Std. Value.					


Pit Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
27/04/2019	185	73	27	11	8
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

Above Std. Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 T - 2969
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Test Report NO : RIN/TR/APRIL-19/W-57 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 : YEKONA I & II OC
 NAME OF THE PROJECT

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
26/04/2019	8.10	32	26	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-57A Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : APRIL
 : YEKONA I & II OC
 NAME OF THE PROJECT Sampling Date : 26/04/2019
 NAME OF LOCATION : DRINKING WATER FROM BORWELL.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.20	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	300	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	160	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.49	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	750	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	54.4	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	40.02	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	195	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	14	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-57A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	240	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : APRIL
NAME OF THE PROJECT : YEKONA I & II OC

Name of the Location : Pit Office MYON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	55.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

ADASA UG EXPN.

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Adasa UG mine is situated in Nagpur District of Maharashtra State and is administered by the Nagpur area of the Western Coalfields Limited.

Communication :

The project area is well connected by all weathered metalled road both to the nearest tahsil town Saoner and district headquarter Nagpur. Saoner railway station, situated on the Nagpur – Chhindawara narrow gauge railway line is at a distance of about 8 Kms. from the block.

Drainage :

The drainage of the project area is controlled by the easterly flowing Kolar and Chandrabhaga Rivers.

Climate :

The area has tropical climate with very hot summer. The temperature rises as high as 48°C in summer. The average annual rainfall is about 1050 mm. The monsoon period is between June to Sept.

Pollution due to other sources :

There are a few small industries near the town. There is no major industry, other than Saoner coal mines, near to the project. The state highway and road to Kalmeshwar, which is very busy due to vehicular movement, produce lot of dust. Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant.

Sampling Location :

Ambient Air Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	At Pathakhedi GP Office	- NAUA-1
2.	Project Manager office	- NAUA-2
3.	Colony (W.T.Plant)	- NAUA-3
4.	Kotodi village	- NAUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NAUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan House	- NAUN-1
2.	Manager Office	- NAUN-2
3.	Colony (Saoner)	- NAUN-3

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N (1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.


Kotodi village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
20/04/2019	189	75	25	12	8
Permissible Limits	200	100	80	80	60

- Above std. value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL'19/W-2 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED -18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : NAGPUR MONTH APRIL
 NAME OF THE PROJECT : ADASA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
18/04/2019	7.5	20	14	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY: WCL
NAME OF THE AREA : NAGPUR
NAME OF THE PROJECT : ADASA UG

YEAR : 2019
MONTH : APRIL

Name of the Location : Near Fan House - NAUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	18/04/2019	70.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Near Manager Office – NAUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	18/04/2019	48.9
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Saoner) - NAUN-4

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	45.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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**ENVIRONMENTAL MONITORING REPORT
BHANEGAON OCP
(NAGPUR AREA)
WESTERN COALFIELDS LTD.**

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
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INTRODUCTION

Location :

The Bhanegaon opencast project is located in Nagpur district of Maharashtra state and administered by Nagpur area of Western Coalfields Ltd.

Communication :

The mine is situated in Kamptee coalfield adjoining GondegaonOC. This area is approachable by all weather road. Kanhan is the nearest railway station which is on Howrah-Mumbai main line of South Eastern Railway.

Drainage :Kanhan river acts as the main drainage channel of the area.

Climate :

The climate of the area is tropical. The temperature rises as high as 47°C in summer. In winter temperature is ranging about 22°C. Monsoon period is generally from June to September. Annual rainfall is about 1000mm.

Other Industry/Coal Mines :

Besides other coal mines viz. Kamptee OC, Inder OC, Gondegaon OC, Ferro Alloys Plants are the major industries in the vicinity of the project area.

Pollution due to other sources:

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. Transportation road, Vehicular traffic, Agricultural and local activities etc., also contribute to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Bina Village	- NBOA-1
2.	Dorli Village	- NBOA-2
3.	Near Manager Office	- NBOA-3
4.	Near Mandir - Sangam	- NBOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NBOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Contractor Camp	- NBON-1

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report AIR QUALITY MONITORING DATA	 TC -7102
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Test Report NO :	RIN/TR/MAR-19/A-1	Date of Issue :	15/06/2019
Name of the Customer:	W,Nagpur	Sampling method :	IS-5182
Customer letter Ref. No. :	WCL/HQ/ENV/17-K/520- 522 DATED -18.04.19	Sample Description :	Air sample 2
		No. of pages :	

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)],PM-2.5 & SPM
AIR QUALITY MONITORING DATA

NAME OF THE COMPANY	: WCL	YEAR	: 2019
NAME OF THE AREA	: NAGPUR	MONTH	: APRIL
NAME OF THE PROJECT	: BHANEGAON OC		

Bina Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	178	130	51	20	14
Permissible Limits	200	100	60	80	80
Dorli Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
26/04/2019	76	61	39	10	7
Permissible Limits	200	100	60	80	80
# - Above Std. Value.					
Near Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	328	219	49	33	24
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120


Near Mandir -Sangam					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
27/04/2019	111	76	37	16	11
Permissible Limits	200	100	60	80	80

- Above Std. Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL'19/W-1 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED -18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : NAGPUR MONTH APRIL
 NAME OF THE PROJECT : BHANEGAON OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
26/04/2019	6.9	28	16	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH : APRIL
NAME OF THE PROJECT : BHANEGAON OC

Name of the Location : Contractor camp - NBON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	52.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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**ENVIRONMENTAL MONITORING REPORT
GONDEGAON EXTN. OC**

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

The Gondegaon opencast mine is located in Nagpur district of Maharashtra state and administered by Nagpur area of Western Coalfields Ltd.

Communication :

The mine is situated in Kamptee coalfield adjoining Inder Colliery and Kanhan river. This area is approachable by all weather road. Kanhan is the nearest railway station which is on Howrah-Mumbai main line of South Eastern Railway.

Drainage : Kanhan river acts as the main drainage channel of the area.

Climate :

The climate of the area is tropical. The temperature rises as high as 47°C in summer. In winter temperature is ranging about 22°C. Monsoon period is generally from June to September. Annual rainfall is about 1000mm.

Other Industry/Coal Mines :

Besides other coal mines viz. Kamptee OC, Inder OC, Ferro Alloys Plants are the major industries in the vicinity of the project area.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant. Transportation road, Vehicular traffic, Agricultural and local activities etc., also contribute to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Colony/ Guest house	- NGOA-1
2.	Ghatrohna village	- NGOA-2
3.	Gondegaon village school	- NGOA-3
4.	Near Substation	- NGOA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Security Check Post / W Bridge	- NGOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NGOW-1
2.	Workshop water (treated) discharge	- NGOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- NGON-1

- | | |
|----------------------------|----------|
| 2. Colony/Gondegao Village | - NGON-2 |
| 3. Ghatrohna Village | - NGON-3 |
| 4. Juni Kamptee Village | - NGON-4 |

Frequency of Monitoring :


- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL'19/A-3 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur Sampling method : IS-5182
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522
 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)],PM-2.5 & SP

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : GONDEGAON OC

Colony/ Guest house					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
19/04/2019	287	109	65#	17	12
20/04/2019	244	118	65#	18	13
25/04/2019	265	183	27	28	20
26/04/2019	349	177	53	27	19
Permissible Limits	200	100	60	80	80
# - Above Std. value.					
Ghatrohna village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
19/04/2019	118	71	43	11	8
20/04/2019	263	106	51	16	12
25/04/2019	271	184	59	28	20
26/04/2019	136	45	27	7	5
Permissible Limits	200	100	60	80	80
# - Above Std. value					

Gondegaon village school					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
19/04/2019	294	137	65#	21	15
20/04/2019	329	154	47	24	17
25/04/2019	370	269	52	41	29
26/04/2019	295	234	48	36	25
Permissible Limits	200	100	60	80	80
# - Above Std. value					
Near Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
20/04/2019	371	256	51	39	27
Permissible Limits	600	300	60	100	100

FUGITIVE DUS MONITORING DATA

1. Security check post/ W.Bridge


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL'19/A-3 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur Sampling method : IS-5182
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 Sample Description :water
 DATED-18.04.19 sample
 No. of pages :1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : NAGPUR MONTH APRIL
 NAME OF THE PROJECT : GONDEGAON OC

Mine Water Discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	6.9	24	16	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 – 9.0	250	100	10

Workshop Effluent (WETP) Water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.2	28	18	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant) **Deepanshu Sahu**
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-3A Date of Issue : 15/06/2019
 Name of the Customer: Env.CMPDI,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-1804.19 Sample Description : Water sample

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT :GONDEGAON OC Sampling Date : 19/04/2019
NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.40	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:1983 EDTA	4.0	180	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	32	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.13	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	394	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	33.6	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	23.34	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	107.92	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	1.594	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-3A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.018	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminc	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	192	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : GONDEGAON OCP

Name of the Location : CHP - NGON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	66.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Gondegao Village /Colony- NGON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	43.4
Permissible Limit		55

Name of the Location : Ghatrohna Village- NGON-3

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	42.6
Permissible Limit		55

Name of the Location : Juni Kamptee Village - NGON-4

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	41.7
Permissible Limit		55

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**ENVIRONMENTAL MONITORING REPORT
INDER UG TO OC EXPN.
(NAGPUR AREA)
WESTERN COALFIELDS LTD.**

(JOB No. 8000002)



APRIL - 2019

**Environment Laboratory
NABL Accredited vide Cert. No. TC-7102**

CMPDI

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INTRODUCTION

Location :

Inder UG to OC Project is situated about 35 kms from Nagpur in Maharashtra State and is administered by the Nagpur Area of the Western Coalfields Limited.

Communication :

This area is approachable by all weather road. Nagpur - Jabalpur State highway is about 5 km from the Colliery. Kanhan is the nearest Railway Station, which is on Howrah - Mumbai main line of South Eastern railway.

Drainage : Kanhan river acts as the main drainage channel of the area.

Climate :

The climate of this area is tropical. The temperature rises as high as 47°C in summer. Winter is mild with temperature ranging about 22°C. Monsoon period is generally from June to September. Annual rainfall is about 1000 mm.

Industry/Coal Mines :

Khandelwal tube and Khandelwal Ferro Alloys are about 8 kms from the mine. Kamptee OC mine and Gondegaon OC mine are near to this project.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant. Transportation road, Vehicular traffic, Agricultural and local activities etc., also contribute to the pollution load of the area.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CMPDI Tekadi Camp	- NIOA-1
2.	Near pit no. 6/ Manager office	- NIOA-2
3.	G.P. office- Kandri	- NIOA-3
4.	Colony-Water treatment plant	- NIOA-3

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	W Bridge	- NIOAF-1
2.	Near Coal Stock Yard	- NIOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NIOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Project Office	- NION-1

Frequency of Monitoring :


Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

- Water** : Water quality is monitored on fortnightly basis.
Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler and Fine Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x), PM-2.5 etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N (1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Remarks : It has been observed that values of SPM and PM-10 is above TLV in AAQ samples monitored in residential area (village and colony) nearby project. Therefore green belt development/ vertical plantation is required in/ around the residential area. Also, proper dust suppression measures to be taken to minimize the pollution load affecting the residential area nearby project.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-4 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur Sample Description : Air sample
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 No. of pages : 1

Test Required : IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : INDER OC

CMPDI Tekadi Camp					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
19/04/2019	206	162	53	25	18
TLV	600	300	60	120	120
Near pit no. 6/ Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	298	126	51	19	14
TLV	600	300	60	120	120
G.P. office- Kandri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
19/04/2019	264 [#]	153 [#]	54	23	17
20/04/2019	390 [#]	110 [#]	57	32	23
27/04/2019	382 [#]	115 [#]	56	33	22
28/04/2019	325 [#]	170 [#]	32	41	20
TLV	200	100	60	80	80
# - Above TLV					

Colony-Water treatment plant

DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
19/04/2019	271#	128#	54	35	24
20/04/2019	297#	155#	41	39	27
27/04/2019	279#	148#	59	38	27
28/04/2019	266#	138#	49	36	26
TLV	200	100	60	80	80

- Above TLV

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH.: APRIL.
NAME OF THE PROJECT : INDER UG TO OC

Name of the Location : R.C. Office - NION-1

Month	Date of Data collection	Noise Level in dB(A)
APRIL.2019	25/04/2019	54.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

KAMPTEE UG TO OC

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001 : 2015 COMPANY

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INTRODUCTION

Location :

The Kamptee UG to OC Project is located in Nagpur district of Maharashtra state and administered by Nagpur area of Western Coalfields Ltd.

Communication :

The mine is situated to the west of National Highway No.7, connecting Nagpur with Jabalpur. The distance by road from Nagpur is about 25 km and the nearest railway station is Kanhan, which is an industrial township on Nagpur-Howrah broad-gauge line of South Eastern Railway.

Drainage :

The drainage of the area is controlled by Kanhan River, which flows in the north east direction about 1 km south of the mine.

Climate :

The climate of the area is tropical. The region experiences dry hot summer from April to June with relative humidity falling below 20%. The temperature rises to a maximum of 47°C. during May. The winter is mild with temperature ranging about 22°C. The rainy season is between mid July and September and the annual rainfall is about 1000mm.

Other Industry/Coal Mines :

Besides other coal mines viz. Inder UG to OC, Gondegaon OC, Khandelwal tube and Ferro Alloys Plants are the major industries, which fall in the vicinity of the Kamptee Opencast Project.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Colony-Water treatment plant	- NKcOA-1
2.	G.P. office- Kandri	- NKcOA-2
3.	Juni Kamptee Village	- NKcOA-3
4.	Substation- Kamptee	- NKcOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1	Railway siding	- NKcOAF-1
2.	CHP	- NKcOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NKcOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- NKcON-1
2.	Colony	- NKcON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler and Fine Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x, PM-2.5 etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N (1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all

parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Remarks : It has been observed that values of SPM and PM-10 is above TLV in AAQ samples monitored in residential area (village and colony) nearby project. Therefore green belt development/ vertical plantation is required in/ around the residential area. Also, proper dust suppression measures to be taken to minimize the pollution load affecting the residential area nearby project.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/A-5 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur Sampling method : IS-5182
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.0419 Sample Description : Air sample

Test Required : IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : KAMPTEE OC

Colony-Water treatment plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
19/04/2019	271 [#]	128 [#]	54	35	24
20/04/2019	297 [#]	155 [#]	41	39	27
27/04/2019	279 [#]	148 [#]	59	38	27
28/04/2019	266 [#]	138 [#]	49	36	26
TLV	200	100	60	80	80
G.P. office- Kandri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
19/04/2019	264 [#]	153 [#]	54	23	17
20/04/2019	390 [#]	110 [#]	57	32	23
27/04/2019	382 [#]	115 [#]	56	33	22
28/04/2019	325 [#]	170 [#]	32	41	20
TLV	200	100	60	80	80
# - Above TLV					


Juni Kamptee Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
19/04/2019	235 [#]	113 [#]	50	17	12
20/04/2019	295 [#]	182 [#]	54	43	20
25/04/2019	239 [#]	168 [#]	53	26	18
26/04/2019	263 [#]	155 [#]	55	24	17
TLV	200	100	60	80	80
Substation- Kamptee					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
19/04/2019	391	261	52	40	28
TLV	600	300	60	120	120

- Above TLV

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-5 Date of Issue : 15/06/2019
 Name of the Customer: Env.CMPDI,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : KAMPTEE OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.0	24	14	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-5A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT :GONDEGAON OC Sampling Date : 25/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.2	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	120	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	28	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.12	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	306	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	16	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	21.384	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	51	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	1.5	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-5A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.018	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	132	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH.: APRIL
NAME OF THE PROJECT : KAMPTEE UG TO OC

Name of the Location :CHP

Month	Date of Data collection	Noise Level in dB(A)
APRIL.2019	25/04/2019	67.6
TLV		75

Name of the Location: Colony

Month	Date of Data collection	Noise Level in dB(A)
APRIL.2019	27/04/2019	44.3
TLV		55

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**ENVIRONMENTAL MONITORING REPORT
PATANSAONGI UG EXPN.**

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102
CMPDI
REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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5.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Patansaongi UG project is located in Nagpur district of Maharashtra state and is administered by Nagpur area of Western Coalfields Limited.

Communication :

The project is situated at a distance of about 22 km from Nagpur on Nagpur-Chhindwara road. Nagpur-Chhindwara narrow gauge rail line passes through the northern part of the project area.

Drainage : The drainage of the area is controlled by Kolar river.

Climate :

The climate of the area is tropical. May is the hottest month with temperature touching 47°C. The coldest month is December, when temperature falls to 10°C. Average annual rainfall is 1050 mm.

Other Industries/Coal Mines :

Silewara, Pipla and Saoner underground projects and Khaparkheda Thermal Power Station are the major industries which fall within the 10 km radius of the project area.

Pollution due to other sources :

State highway is adjacent to the project. State highway and Khaparkheda Thermal Power Station are also expected to contribute in increasing the air pollution load of the area. The air pollution due to working of the UG mine is insignificant. Transportation road, Vehicular traffic, Agricultural and local activities etc., also contribute to the pollution load of the area.

Sampling location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Colliery Manager office /Near CHP	- NPUA-1
2.	Near LCH Qr.	- NPUA-2
3.	Sadbhavna Nagar(filter plant)	- NPUA-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NPUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- NPUN-1
2.	Colony	- NPUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

nitrogen (NO_x) etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-6 Date of Issue : 15/06/2019
Name of the Customer: WCL,Nagpur
Customer letter Ref. No. : WCL/HQ/ENV/17-K/520- Water
522 DATED -18.04.19 Sample Description : sample
No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR 2019
NAME OF THE AREA : NAGPUR MONTH APRIL
NAME OF THE PROJECT : PATANSAONGI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
18/04/2019	7.5	36	20	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-6A Date of Issue : 15/06/2019
 Name of the Customer: Env.CMPDI,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : PATANSAONGI UG Sampling Date : 18/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.50	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	204	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	46	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.27	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	392	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	54.4	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	43.74	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	0.022	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	92.6	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	10.70	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-6A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	288	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH. : APRIL
NAME OF THE PROJECT : PATANSAONGI UG

Name of the Location : CHP - NPUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	18/04/2019	57.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Sadbhavna Nagar) - NPUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	18/04/2019	46.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

PIPLA UG

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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3.	DRINKING WATER QUALITY MONITORING DATA	5-6
4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Pipla Colliery is situated in the West of Silewara Colliery in Nagpur District of Maharashtra State. It is under the administrative control of Nagpur Area of Western Coalfields Limited.

Communication :

The project area is about 2 km from Nagpur-Chhindwara State Highway. It is also connected to Silewara colliery. The Nagpur-Chhindwara narrow gauge railway line of SE Railway passes immediate south of the colliery property.

Drainage :

The drainage of the area is principally controlled by Kolar-Pimpri river in the South and Kanhan river in the North. There are a number of small seasonal nallahs which traverse over the area and discharge the water during rainy season into these two rivers.

Climate :

The climate of this area is tropical. The temperature rises as high as 47°C in summer. Monsoon period is generally from June to September.

Industry/Coal Mines :

Khaparkheda and Koradi Thermal Power Stations of MSEB lies at a distance of 6 kms and 7 kms respectively. Patansaongi UG and Silewara UG mines of WCL are also near to this mine.

Pollution due to other sources :

Nagpur - Chhindwara State highway is about 2 kms from the project. Road traffic is also likely to contribute to the air pollution in the surrounding area.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Filter plant	- NPLUA-1
2.	In zone -4	- NPLUA-2
3.	Near Magazine/Manager office	- NPLUA-3
4.	Shiv Mandir	- NPLUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NPLUW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan House	- NPLUN-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/A-7 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur Sampling method : IS-5182
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED -18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)],PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : PIPLA UG

Filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	267	95	31	15	10
Permissible Limits	200	100	60	80	80
# - Above Std. value.					
In zone -4					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	301	232	57	35	25
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Near Magzine/Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	331	236	54	36	25
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

Shiv Mandir


DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	229	96	32	15	11
Permissible Limits	200	100	60	80	80

- Above Std. value.

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-7 Date of Issue : 15/06/2019
 Name of the Customer: WCL, NAGPUR
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : PIPLA UG Sampling Date : 21/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.50	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:1983 EDTA	4.0	168	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	52	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.09	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	408	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	20.8	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	28.188	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	93.4	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	10.86	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-7

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	228	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH : APRIL
NAME OF THE PROJECT : PIPLA UG

Name of the Location : Near Fan House - NPLUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	21/04/2019	45.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT SAONER UG EXPN.

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL -2019

**Environment Laboratory
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**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location :

SaonerUG mine is situated in Nagpur District of Maharashtra State and is administered by the Nagpur area of the Western Coalfields Limited. There are three projects - Saoner-I UG, Saoner -II UG and Saoner -III UG.

Communication :

These projects are well connected by all weathermetalled road. These projects are about 40 kms away from Nagpur city. Nagpur - Chhindwara road is about 5 km from the mines. Saoner - Kalmeshwar road is also very near to the projects. Saoner railway station of S.E. Railway is the nearest rail head.

Drainage : The drainage is principally controlled by Kolar river.

Climate : The area has tropical climate with very hot summer. The temperature rises as high as 46°C in summer. The average annual rainfall is about 1050 mm. The monsoon period is between June to Sept.

Industry/Coal Mines :

There are a few small industries near the town. There is no major industry near to the project. The state highway and road to Kalmeshwar, which is very busy due to vehicular movement, produce lot of dust.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Colliery Manager Office, SaonerUG-I	-	NSUA-1
2.	Colliery Manager office, SaonerUG-II	-	NSUA-2
3.	Water Treatment Plant	-	NSUA-3
4.	Kotodi village	-	NSUA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	NSUAF-1
2.	Rly. Siding	-	NSUAF-2

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge - Saoner - I UG	-	NSUW-1
2.	Mine water discharge - Saoner - II UG	-	NSUW-2
3.	Mine water discharge - Saoner - III UG	-	NSUW-3

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near CHP - Saoner - I UG	- NSUN-1
2.	Near CHP - Saoner - II UG	- NSUN-2
3.	Near CHP – Saoner - III UG	- NSUN-3
4.	Colony	- NSUN-4

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Kotodi village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
20/04/2019	189	75	25	12	8
3Permissible Limits	200	100	60	80	80

#-AboveStd.Value

FUGITIVE DUS MONITORING DATA

1. CHP

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

2. Raw\ilway Siding


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-8 Date of Issue : 15/06/2019
 Name of the Customer: WCLI,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED -18.04.19 Sample Description : Water sample
 No. of pages : 2

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : NAGPUR MONTH. APRIL
 NAME OF THE PROJECT : SAONER UG


Mine water discharge (Saoner I)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.1	24	14	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
Mine water discharge (Saoner II)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.2	28	16	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

Mine water discharge (Saoner III)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	7.4	32	18	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-8A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED -18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : SAONER UG Sampling Date : 19/04/2019
NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.50	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	180	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	42	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.52	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	410	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	33.6	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	23.328	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	106.16	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	9.710	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-8A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.041	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	276	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH. : APRIL
 NAME OF THE PROJECT : SAONER UG

Name of the Location : Near Fan House (Saoner – I UG) - NSUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	69.1
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Near Fan House (Saoner – II UG) - NSUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	68.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Near Fan House (Saoner – III UG) - NSUN-3

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	69.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Saoner) - NSUN-4

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	45.4
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

SILEWARA UG

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL- 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

The Silewara UG project is located in the Nagpur district of Maharashtra state and is administered by Nagpur Area of Western Coalfields Limited.

Communication :

The project is approachable by an all weather Nagpur-Chhindwara State Highway from Khaparkheda Thermal Power Station. Nagpur-Chhindwara narrow gauge railway line of South-Eastern Railways passes through south of this area.

Drainage :

The drainage of the area is controlled by Kolar river to the south and Kanhan river in the north.

Climate :

The climate of the area is tropical. The temperature falls down to 7.°C in winter and rises as high as 47°C in summer. The annual rainfall is about 1050mm and it normally occurs between June and September.

Other Industries/Coal Mines :

Besides other coal mines viz. Pipla UG, Patansaongi UG, Koradi TPS and Kaparkheda TPS are the main industries which fall within 10 km radius of the Silewara UG Project.

Pollution due to the sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Chankapur Pump house	- NSLUA-1
2.	Mandir (Near Kanhan river)	- NSLUA-2
3.	V.T.C. – Silewara	- NSLUA-3
4.	Water filter plant	- NSLUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NSLUW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan house	- NSLUN-1
2.	Colony	- NSLUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphito-mercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-9 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : air sample
 No. of pages : 2
 Test Required : IS-5182 [PM-10(04:1999), NOx(06:2006), SO₂(02:2001)],PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH. : APRIL
 NAME OF THE PROJECT : SILEWARA UG


Chankapur pump house/Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	315	155	51	24	17
Permissible Limits	200	100	60	80	80
Mandir (near Kanhan river)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	Pm-10	PM-2.5	NOx	SOx
21/04/2019	214	76	25	12	9
Permissible Limits	200	100	60	80	80
V.T.C. – Silewara					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	349	160	53	24	17
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
#-Above std. value					

Water filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	282	122	40	19	13
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-9A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : PIPLA UG Sampling Date : 21/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.30	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:1983 EDTA	4.0	204	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	130	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.15	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	542	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	54.4	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	43.74	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	103.68	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	1.274	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-9A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.018	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	228	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH.: APRIL
NAME OF THE PROJECT : SILEWARA UG

Name of the Location : Near Fan House - NSLUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	20/04/2019	69.9
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - NSLUN-2

Month	Date of Data Collection	Noise Level in dB(A)
		Day Time
APRIL.2019	20/04/2019	44.7
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT SINGORI OC

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location :

Singori OC mine is situated in Nagpur District of Maharashtra State and is administered by the Nagpur area of the Western Coalfields Limited.

Communication :

These projects are well connected by all weathermetalled road. These projects are about 40 kms away from Nagpur city. Nagpur - Chhindwara road is about 5 km from the mines. Saoner - Kalmeshwar road is also very near to the projects. Saoner railway station of S.E. Railway is the nearest rail head.

Drainage : The drainage is principally controlled by Kolar river.

Climate : The area has tropical climate with very hot summer. The temperature rises as high as 46°C in summer. The average annual rainfall is about 1050 mm. The monsoon period is between June to Sept.

Industry/Coal Mines :

There are a few small industries near the town. There is no major industry near to the project. The state highway and road to Kalmeshwar, which is very busy due to vehicular movement, produce lot of dust.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Contactor Camp	-	NSOA-1
2.	Soholi Village	-	NSOA-2
3.	Doroli Village	-	NSOA-3
4.	Hingana village	-	NSOA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Coal Stock Yard	-	NSOAF-1
2.	Weigh Bridge	-	NSOAF-2

Water Quality Monitoring location

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	NSOAW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Contactor Camp	-	NSON-1
2.	Soholi Village	-	NSON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- TPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Due to non-availability, mine water discharge could not be monitored during this month.

Noise : Noise level data are recorded fortnightly.

Hingana Village					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NOx	SOx
26/04/2019	157	95	44	15	11
Permissible Limits	200	100	60	80	80

Above Std. Value

FUGITIVE DUST MONITORING DATA

1. Weigh Bridge

(24 hourly values in $\mu\text{g}/\text{m}^3$)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

2. Coal Stock

(24 hourly values in $\mu\text{g}/\text{m}^3$)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH. : APRIL
NAME OF THE PROJECT : SINGORI OC

**Name of the Location:
Contractor Camp**

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	50.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

**Name of the Location:
Sohali Village**

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	44.2
PERMISSIBLE LIMIT		55

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ENVIRONMENTAL MONITORING REPORT DINESH / MAKARDHOKRA-III OC

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

The Dinesh/ Makardhokra- III OC project is located in Nagpur district of Maharashtra State and is administered by the Umrer area of Western Coalfields Limited.

Communication :

The project is connected by road with Nagpur city. It is about 55 km south west of Nagpur and 10 km west of Umrer. The nearest railway station is Umrer on the Nagpur-Nagbhid-Chandrapur Fort (Narrow gauge) of SE railway.

Drainage :

The drainage of the area is controlled by Amb river which flows in the east of the area.

Climate :

The climate of the area is generally dry and hot. May is the hottest month and the temperature rises to 47°C. December is the coldest month with temperature falling to 7°C. Average annual rainfall in this area is around 1200 mm.

Other Industries/Coal Mines :

Umrer opencast project falls within 10 km radius of the Makardhokra OC project. There is no other major industry in the vicinity of the project area.

Pollution due to other sources :

As there is no other major industry nearby the project area, only road transport is the other source, which may contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	Manger Office/	-	UM ₃ OA-1
2.	Near Railway in motion weigh Bridge	-	UM ₃ OA-2
3.	Sirpur Village	-	UM ₃ OA-3
4.	Kanwa village	-	UM ₃ OA-4

Water Quality Monitoring location :

S.No.	Location Details		Location Code
1.	Mine Water Discharge	-	UM ₃ OW-1
2.	ETP (Workshop) - treated water sample-		UM ₃ OW-2

Noise Level Monitoring location :

S.No.	Location Details	Location Code
1.	Near Pit office	UM ₃ ON-1

Frequency of Monitoring :

- Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water : Water quality is monitored on fortnightly basis.
- Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂ : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated

by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

PM-2.5 Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analyzed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-15 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.0419 Sample Description : Air sample 2
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)],PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : APRIL
 NAME OF THE PROJECT : MAKARDHOKRA - III OC

Manger Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
28/04/2019	351	192	56	29	21
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Near Railway in motion weigh Bridge					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
29/04/2019	318	201	26	31	22
Permissible Limits	600	300	120	120	60
Sirpur Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	352	107	36	17	12
22/04/2019	136	28	28	5	4
29/04/2019	360	198	55	30	21
30/04/2019	279	94	21	15	10
Permissible Limits	200	100	60	80	80
# Above Std. Value					


Kanwa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	259	146	11	27	25
22/04/2019	311	213	30	32	23
29/04/2019	301	187	62	23	21
30/04/2019	348	198	55	25	22
Permissible Limits	200	100	60	80	80

Above Std. Value

(Scientific Assistant)

DeepanshuSahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-15 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.0419 Sample Description : Water sample
 No. of pages : 2

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : UMRER MONTH APRIL
 NAME OF THE PROJECT : MAKARDHOKRA-III OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
27/04/2019	8.1	28	18	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
ETP (Workshop) - Treated water sample				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
27/04/2019	8.0	20	16	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH : APRIL
NAME OF THE PROJECT : MAKARDHOKRA - III OC

Name of the Location : Pit Office - UM₃ON-I

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	56.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

GOKUL OC

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory

NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location :

The Gokul OC project is located in Nagpur district of Maharashtra State and is administered by the Umrer area of Western Coalfields Limited.

Communication :

The project is connected by road with Nagpur city. The nearest railway station is Umrer on the Nagpur-Nagbhid-Chandrapur Fort (Narrow gauge) of SE railway.

Drainage :

The drainage of the area is controlled by Amb river which flows in the east of the area.

Climate :

The climate of the area is generally dry and hot. May is the hottest month and the temperature rises to 47°C. December is the coldest month with temperature falling to 7°C. Average annual rainfall in this area is around 1200 mm.

Other Industries/Coal Mines :

Umrer opencast project falls within 10 km radius of the Makardhokra OC project. There is no other major industry in the vicinity of the project area.

Pollution due to other sources :

As there is no other major industry nearby the project area, only road transport is the other source, which may contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	Besur Village	-	UGOA-1
2.	Contractor Camp	-	UGOA-2
3.	Nand Village	-	UGOA-3
4.	Polgaon	-	UGOA-4

Water Quality Monitoring location :

S.No.	Location Details		Location Code
1.	Mine water discharge	-	UGOW-1
2.	ETP (Workshop) water discharge	-	UGOW-2

Noise Level Monitoring location :

S.No.	Location Details	Location Code
1.	Contractor Camp	UGON-1


Frequency of Monitoring :

- Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water : Water quality is monitored on fortnightly basis.
- Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size>10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

- SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-16 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NOx(06:2006), SO₂(02:2001)],PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : APRIL
 NAME OF THE PROJECT : GOKUL OC

Besur Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
19/04/2019	142	52	19	8	6
Permissible Limits	200	100	60	80	80
Contractor Camp					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
19/04/2019	54	41	21	7	5
Permissible Limits	600	300	60	120	120
Nand Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
19/04/2019	110	38	15	6	5
Permissible Limits	200	100	60	80	80
# Above Std. Value					


Polgaon Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
19/04/2019	90	81	24	13	9
Permissible Limits	200	100	60	80	80

Above Std. Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC- 7102
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Test Report NO : RIN/TR/APRIL-19/W-16 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : UMRER MONTH APRIL
 NAME OF THE PROJECT : GOKUL OC


Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
18/04/2019	8.7	28	20	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

ETP (Workshop) water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
18/04/2019	8.8	32	24	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-16A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.0419 Sample Description : Water sample
 No. of pages : 2

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : GOKUL OC Sampling Date : 27/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.60	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	220	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	258	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.91	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	826	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	38.4	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	30.132	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	0.020	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	103.68	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	32.28	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-16A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	360	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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- Note: 1) This Report refers to the values related to the items tested as received.
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH. : APRIL
NAME OF THE PROJECT : GOKUL OC

Name of the Location : Contractor Camp - UGON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	18/04/2019	55.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT MAKARDHOKRA – II OC

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

The Makardhokra- II OC project is located in Nagpur district of Maharashtra State and is administered by the Umrer area of Western Coalfields Limited.

Communication :

The project is connected by road with Nagpur city. It is about 55 km south west of Nagpur and 10 km west of Umrer. The nearest railway station is Umrer on the Nagpur-Nagbhid-Chandrapur Fort (Narrow gauge) of SE railway.

Drainage :

The drainage of the area is controlled by Amb river which flows in the east of the area.

Climate :

The climate of the area is generally dry and hot. May is the hottest month and the temperature rises to 47°C. December is the coldest month with temperature falling to 7°C. Average annual rainfall in this area is around 1200 mm.

Other Industries/Coal Mines :

Umrer opencast project falls within 10 km radius of the Makardhokra OC project. There is no other major industry in the vicinity of the project area.

Pollution due to other sources :

As there is no other major industry nearby the project area, only road transport is the other source, which may contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	SAM office	-	UMOA-1
2.	Near Manager office	-	UMOA-2
3.	Kanwa village	-	UMOA-3
4.	Colony (Near Pump House	-	UMOA-4

Water Quality Monitoring location :

S.No.	Location Details		Location Code
1.	Mine water discharge	-	UMOW-1

2. ETP (Workshop) - treated water sample - UM(ETP)OW-2

Noise Level Monitoring location :

S.No.	Location Details	Location Code
1.	Near Pit office	- UMON-1
2.	Colony (Umrer)	- UMON-2

Frequency of Monitoring :


- Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
Water : Water quality is monitored on fortnightly basis.
Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite

ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

- SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-13 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : r sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : APRIL
 NAME OF THE PROJECT : MAKARDHOKRA - II OC

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	331	272	57	41	29
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Near Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	341	297	55	45	32
TLV as per Env.(Protection) Amendment Rule 2000	600	300	120	120	60
Kanwa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	159	46	11	7	5
22/04/2019	311	213	30	32	23
29/04/2019	301	287	62	43	31
30/04/2019	348	298	55	45	32
Permissible Limits	200	100	60	80	80
#-above Std.Value					

Near pump house/Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	305	157	17	18	17
22/04/2019	254	139	18	21	15
29/04/2019	321	124	17	13	9
30/04/2019	314	150	18	21	22
Permissible Limits	200	100	60	80	80

- Above Std. value.

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH.: APRIL
NAME OF THE PROJECT : MAKARDHOKRA - II OC

Name of the Location : Near Pit Office - UMON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	55.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - UMON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	43.6
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT MAKARDHOKRA – I OC

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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INTRODUCTION

Location :

The Makardhokra- I OC project is located in Nagpur district of Maharashtra State and is administered by the Umrer area of Western Coalfields Limited.

Communication :

The project is connected by road with Nagpur city. It is about 55 km south west of Nagpur and 10 km west of Umrer. The nearest railway station is Umrer on the Nagpur-Nagbhid-Chandrapur Fort (Narrow gauge) of SE railway.

Drainage :

The drainage of the area is controlled by Amb river which flows in the east of the area.

Climate :

The climate of the area is generally dry and hot. May is the hottest month and the temperature rises to 47°C. December is the coldest month with temperature falling to 7°C. Average annual rainfall in this area is around 1200 mm.

Other Industries/Coal Mines :

Umrer opencast project falls within 10 km radius of the Makardhokra OC project. There is no other major industry in the vicinity of the project area.

Pollution due to other sources :

As there is no other major industry nearby the project area, only road transport is the other source, which may contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	Pit office	-	UM ₁ OA-1
2.	Sirpur village	-	UM ₁ OA-2
3.	Near Kanwa Village)	-	UM ₁ OA-3
4.	Near pump house/Colony	-	UM ₁ OA-4

Water Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	Mine Water Discharge	-	UM ₁ OW-1

Noise Level Monitoring location :

S.No.	Location Details		Location Code
1.	Near Pit office	-	UM ₁ ON-1

Frequency of Monitoring :

- Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water : Water quality is monitored on fortnightly basis.
- Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N (1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Day time and Night time Noise level data are recorded fortnightly.

Kanwa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	259	146	11	27	25
22/04/2019	311	213	30	32	23
29/04/2019	301	187	62	23	21
30/04/2019	348	198	55	25	22
Permissible Limits	200	100	60	80	80
# - Above Std. value.					
Near pump house/Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	NOx	NOx	SOx
21/04/2019	305	157	17	18	17
22/04/2019	254	139	18	21	15
29/04/2019	321	124	17	13	9
30/04/2019	314	150	18	21	22
Permissible Limits	200	100	60	80	80

- Above Std. value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH. : APRIL
NAME OF THE PROJECT : MAKARDHOKRA - I OC

Name of the Location : Near Pit Office - UM₁ON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	20/04/2019	54.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

MURPAR UG

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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JARIPATKA, NAGPUR, PIN – 440 014

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INTRODUCTION

Location :

Murpar Underground Project is located in Chandrapur district of Maharashtra State and is administered by Umrer Area of Western Coalfields Limited.

Communication :

This project is situated on Warora - Wani State High Way. Chimur, a small block town is situated about 8 Kms from the project. Warora is the nearest Railway Station about 43 Kms away from the project, located in Chennai - Nagpur C. R. Line.

Drainage : Drainage of the area is controlled by Gani nalla, which flows through central part of the project area.

Climate : The climate of the area is tropical with well-defined summer from April to June, rainy season from July to September and winter from December to APRILuary. In summer, the temperature generally goes to a maximum of 47°C whereas in winter, it generally falls to a minimum of 7°C. The average annual rainfall is about 1200 mm.

Other Industries : There is no other major industries in the vicinity of the project area.

Pollution due to other sources : As there is no other major industry nearby the project area, only road transport is the other source, which may contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		
1.	Colony	-	UMUA-1
2.	Morpar village	-	UMUA-2
3.	Near magazine building	-	UMUA-3
4.	Near pit house	-	UMUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	UMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	UMUN-1
2.	Colony	-	UMUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

nitrogen (NO_x) etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, mine water discharge are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule. Due to non-availability of mine water discharge, mine water sample could not be analysed from this project during this quarter.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-16 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2
 Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)],PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : APRIL
 NAME OF THE PROJECT : MURPAR UG


Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
20/04/2019	156	71	22	11	8
Permissible Limits	200	100	60	80	80
Morpar village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
20/04/2019	99	76	27	12	9
Permissible Limits	200	100	60	80	80
Near magazine building					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
20/04/2019	84	38	16	6	5
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
#-Above Std.Value.					

Near pit house					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
20/04/2019	75	47	28	8	6
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-16 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : UMRER MONTH APRIL
 NAME OF THE PROJECT : MURPAR UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
19/04/2019	8.8	24	18	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

-
- Note: 1) This Report refers to the values related to the items tested as received.
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-16A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : UMRER OC Sampling Date : 27/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.40	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	112	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	54	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.04	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.68	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	280	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	24	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	12.63	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	0.032	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	68	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	14.78	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-16A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.014	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	140	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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-

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH : APRIL
NAME OF THE PROJECT : MURPAR UG

Name of the Location : Near Fan House - UMUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	63.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - UMUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	42.7
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT
UMRER OC
(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102
CMPDI
REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Umrer opencast project falls in the Nagpur district of Maharashtra state and is administered by Umrer Area of Western Coalfields Limited.

Communication :

This area is approachable by an all weather road Nagpur - Umrer state Highway. The distance of the project is about 45 km from Nagpur city.

Drainage : The drainage of the area is controlled by Amb river.

Climate :

The climate of the area is tropical. In summer the temperature rises as high as 46°C. The average annual rainfall is 1200 mm. Monsoon period normally occurs between June and September. In summer relative humidity goes down as low as 18%.

Industry :

There is no major industry near the project. Makardhokra opencast mine has been working about 4 km from the project.

Pollution due to other source :

The state highway roads which are adjacent to the project produce lot of dust due to heavy vehicular traffic.

Sampling Locations :

Ambient Air Quality Monitoring Locations :

S.No.	<u>Details of Location</u>	<u>Code No.</u>
1.	Near pump house/Colony	- UUOA-1
2.	Near Kanwa village	- UUOA-2
3.	Near Workshop	- UUOA-3
4.	Colony (Pump house)	- UUOA-4

Fugitive Dust Monitoring Locations :

S.No.	<u>Details of Location</u>	<u>Code No.</u>
1.	Weigh Bridge	- UUOAF-1
2.	CHP	- UUOAF-2
3.	Rly Siding	- UUOAF-3

Water Quality Monitoring Locations :

S.No.	<u>Details of Location</u>	<u>Code No.</u>
1.	Mine water discharge	- UUOW-1
2.	ETP (Workshop) - treated water sample	- UU(ETP)W-2

Noise Level Monitoring Locations :

S.No.	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP	- UUON-1
2.	Colony	- UUON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Water samples are collected on fortnightly basis in plastic zaricane and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Near Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
27/04/2019	358	185	50	28	20
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
#-above Std.Value.					
Umrer Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
27/04/2019	218	152	48	23	16
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

#-above Std.Value

FUGITIVE DUST MONITORING DATA

1.Rly Siding

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

2. CHP

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

3.Weigh Bridge


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
30/04/2019	386	204	13

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-17A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : APRIL
 NAME OF THE PROJECT : UMRER OC Sampling Date : 27/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.30	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ - mg/l	IS-3025/21:1983 EDTA	4.0	428	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	88	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.54	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	720	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	96	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	45.68	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	114	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	13.2	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-17A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	164	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH : APRIL
NAME OF THE PROJECT : UMRER OCP

Name of the Location : CHP - UUON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	67.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - UUON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	43.6
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

EXPN. OF GHUGUS OC

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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4.	NOISE LEVEL DATA	9

INTRODUCTION

Location :

Ghugus Opencast Project is located in Chandrapur district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The approach road to the project is connected to Nagpur-Chandrapur highway roughly at a distance of 28 km from Chandrapur city by a 20 km long road branching off westward. The project is also well connected by Tadali-Ghugus branch line of Central railway.

Drainage : Wardha river and its tributaries serve as the main drainage of the area.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above-mentioned industries and the busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	ACC patch / Manager office	-	WGOA-1
2.	Ramnagar colony	-	WGOA-2
3.	SAM Office	-	WGOA-3
4.	Ghugus village	-	WGOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	WGOW-1
2.	Workshop water discharge	-	WGOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	WGON-1
2.	Colony	-	WGON-2

Frequency of Monitoring :


Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Water samples are collected on fortnightly basis in plastic zaricane and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Due to non-availability, mine water discharge could not be monitored during this month.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-38A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 Test Required : IS-5182 [PM-10(04:1999), NOx(06:2006), SO₂(02:2001)], PM-2.5
 & SPM

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH. : APRIL
 NAME OF THE PROJ T : GHUGUS OCP

ACC Patch Near ACC Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
20/04/2019	267	133	13	20	14
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Ram Nagar Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
24/04/2019	253	118	52	18	13
Permissible Limits	200	100	60	80	80
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
20/04/2019	398	178	52	27	19
Permissible Limits	600	300	60	120	120

#-Above std.value

Ghugus village (GP Office)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	345	289	35	44	31
Permissible Limits	200	100	60	80	80

#-Above std.value

FUGITIVE DUST MONITORING DATA


CHP			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

Rly. Sidding			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-38A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : APRIL
 NAME OF THE PROJECT : GHUUS OC Sampling Date : 20/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	<1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.30	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:1983 EDTA	4.0	304	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	64	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.04	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.86	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	622	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	62.4	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	35.6	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	188	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	18	45	No relaxation


Test Report No: RIN/TR/APRIL-19/W-38A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.016	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	184	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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 3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-38B Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : APRIL
 NAME OF THE PROJECT : GHUGUS OC Sampling Date : 20/04/2019
NAME OF LOCATION : DRINKING WATER FROM TRANSIT HOSTEL.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	3	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.00	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:1983 EDTA	4.0	360	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	76	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.56	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	734	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	70.4	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	44.9	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	234	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	20.08	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-42B

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd EditionCarmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	176	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH. : APRIL
NAME OF THE PROJECT : GHUGUS OC

Name of the Location : CHP - WGON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	19/04/2019	66.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - WGON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	45.1
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

KOLGAON OC EXPN.

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Kolgaon Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The project is well connected by all weather road with Wani and also approachable by fair weather road from Ghugus.

Drainage :

Drainage of the area is controlled by Wardha river in North and Penganga river in South.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above mentioned industries and the busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- WKOA-1
2.	Kolgaon village	- WKOA-2
3.	Kailash Nagar township near Filter Plant	- WKOA-3
4.	SAM Office (Mugoli)	- WKOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- WKOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- WKON-1
2.	Colony(Mugoli)	- WKON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5

m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

PM-2.5 Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Due to non-availability, mine water discharge could not be monitored during this month.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-39 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH. : APRIL
 NAME OF THE PROJECT : KOLGAON OCP

Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	217	155	19	24	17
Permissible Limits	600	300	60	120	120
Kolgaon Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	298	214	63 [#]	33	23
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
Kailashnagar Township -F.Plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	329	289	74 [#]	44	31
Permissible Limits	200	100	60	80	120
# - Above Std. Value					


SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	389	239	26	36	26
-	-	-	-	-	-
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

- Above Std. Value

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-41 Date of Issue : 15/06/2019
Name of the Customer: WCL, Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH. : APRIL
NAME OF THE PROJECT : KOLGAON OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
20/04/2019	7.90	32	26	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH. : APRIL
NAME OF THE PROJECT : KOLGAON OC

Name of the Location : Manager's Office - WKON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	20/04/2019	53.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Mugoli) - WKON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	44.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

MUGOLI OC EXPN.

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location :

Mugoli Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The project is well connected by all weather road with Wani and also approachable by fair weather road from Ghughus.

Drainage :

Drainage of the area is controlled by Wardha river in North and Penganga river in South.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above mentioned industries and the busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Sub-station	-	WMOA-1
2.	Kailash Nagar township (Filter Plant)	-	WMOA-2
3.	Tube well near Sakhara village	-	WMOA-3
4.	SAM Office	-	WMOA-4

Fugitive Dust Monitoring locations :

<u>S NO</u>	<u>Location Details</u>		
1.	Security Check post	-	WMOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	WMOW-1
2.	WETP water discharge	-	WMOW-2
3.	DETP water discharge	-	WMOW-3

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	WMON-1
2.	Colony	-	WMON-2

Frequency of Monitoring :


Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-40 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH. : APRIL
 NAME OF THE PROJECT : MUGOLI OCP

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	389	239	26	36	26
Permissible Limits	600	300	60	120	120
Kailash nagar Township - F. Plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	329	289	74 [#]	44	31
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
Tube well Near Sakhara Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	269	120	47	18	13
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
# - Above std. value					

Sub – Station					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
27/04/2019	360	185	51	28	20
Permissible Limits	600	300	60	120	120

- Above std. value.


FUGITIVE DUST MONITORING DATA

Security check post			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
26/04/2019	365	225	65

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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 3) * - Test parameter not unde

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-40 Date of Issue :15/06/19
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : APRIL
 NAME OF THE PROJECT : MUGOLI OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
24/04/2019	7.70	52	50	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
24/04/2019	7.40	44	56	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
S.T.P. (Domestic Effluent) - Treated Water				
Date of Sample Collection	Analysis Results			
	TSS (mg/l) IS-3025/17:1984		BOD (3 days 27°C) mg/l	
Below Detection Limit	10		2	
-	-		-	
TLV as per Env.(Protection) Amendment rule 2000	100		30	

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 3) * - Test parameter not unde

Test Report No: RIN/TR/APRIL-19/W-40A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.013	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	208	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH. : APRIL
NAME OF THE PROJECT : MUGOLI OC

Name of the Location : CHP - WMON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	65.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - WMON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	44.4
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT
BELLORA-NAIGAON DEEP EXPN. OC
(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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1.	INTRODUCTION	1-2
2.	AIR QUALITY MONITORING DATA	3-4
3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Bellora-Naigaon Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The approach road to the project is connected to Nagpur-Chandrapur highway roughly at a distance of 28 km from Chandrapur city by a 20 km long road branching off westward. The project is also well connected by Tadali-Ghughus branch line of Central railway.

Drainage :

Drainage of the area is controlled by Wardha River in North and Penganga River in South.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above-mentioned industries and busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	SAM Office	- WN _G OA-1
2.	Bellora Rehabilitation	- WN _G OA-2
3.	Filter plant near VIP guest house	- WN _G OA-3
4.	Workshop (ETP) NOCM - I	- WN _G OA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Weight Bridge	- WN _G OAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- WN _G OW-1
2.	ETP discharge	- WN _G OW-2

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- WN _G ON-1
2.	Colony (Ghughus)	- WN _G ON-2

Frequency of Monitoring :


Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-41 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2
 Test Required : IS-5182 [PM-10(04:1999), NOx(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : APRIL
 NAME OF THE PROJECT : BELLORA-NAIGAON OCP

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	132	113	34	17	12
Permissible Limits	600	300	60	120	120
Bellora Rehabililtation Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	359	143	56	22	16
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
Filter plant near VIP guest house					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	365	111	64 [#]	17	12
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
# - Above Std. Value					

Workshop ETP NOCM – I					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
22/04/2019	180	58	48	9	7
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

- Above Std. Value

FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH : APRIL
NAME OF THE PROJECT : BELLORA-NAIGAON OC

Name of the Location : CHP - WN_GON-1

Month	Date of Data Collection	Noise Level in dB(A)
		Day Time
APRIL.2019	22/04/2019	65.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony(Ghugus) - WN_GON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	45.1
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

NILJAI OC

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

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3.	EFFLUENT WATER QUALITY MONITORING DATA	6
4.	DRINKING WATER QUALITY MONITORING DATA	7-8
5.	NOISE LEVEL DATA	8

INTRODUCTION

Location :

Niljai opencast project is administered by Wani Area of Western Coalfields Limited. It falls in Wani Tahsil of Yeotmal district of Maharashtra state.

Communication :

The nearest rail head is Ghugus Rly. Station on Tadali-Ghugus branch line of Central Railway. The project is connected by road with Ghugus and Wani.

Drainage : Wardha River serves as the main drainage during rainy season.

Climate :

The climate of this area is tropical. In summer the temperature goes up as high as 46°C. to 47°C. and relative humidity goes down as low as 18%.

Industry :

Within a range of 10 km there are number of major industries viz; (1) ACC (2) Lloyed Steel (3) Coal mines viz - Naigaon OC, Ghugus OC etc.

Pollution due to other sources :

The industries like Cement Plant, Lloyed Steel, and Brick Kiln are also likely to contribute in increasing the pollution in nearby villages/colony.

Sampling Locations :

Ambient Air Quality Monitoring Locations :

S.No.	<u>Details of Location</u>		<u>Code No.</u>
1.	Niljai Colony	-	WNOA-1
2.	Taroda village	-	WNOA-2
3.	Civil Office	-	WNOA-3
4.	Workshop (ETP) of NOCM - I	-	WNOA-4

Fugitive Dust Monitoring Locations :

S.No.	<u>Details of Location</u>		<u>Code No.</u>
1.	Weigh Bridge	-	WNOAF-1
2.	CHP	-	WNOAF-2

Water Quality Monitoring Locations :

S.No.	<u>Details of Location</u>		<u>Code No.</u>
1.	Mine water discharge, Niljai-I	-	WNOW-1
2.	Mine water discharge, Niljai-II	-	WNOW-2
3.	ETP (Niljai) treated water	-	WN(ETP)W-3
4.	ETP (Niljai - S) treated water	-	WN(ETP)W-4
5.	STP (Domestic Effluent) - treated water	-	WN(STP)W-5

Noise Level Monitoring Locations (with Location Code) :

S.No.	<u>Details of Location</u>		<u>Code No.</u>
1.	CHP (Niljai OC)	-	WNON-1
2.	CHP (Niljai – S OC)	-	WNON-2
3.	Colony	-	WNON-3

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected once in each fortnight in a month with APM 451 Respirable dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended Particulate Matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable dust sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size > 10 micron) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass micro fiber filter paper. The Respirable dust (**PM-10**) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of Oxides of Nitrogen is based on the procedure of "**Jacobs and Hochheiser method**". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of "**West and Gaeke method**". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphito-mercurate. The amount of

Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Water samples are collected from prefixed locations in plastic zaricanes and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-42 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : APRIL
 NAME OF THE PROJECT : NILJAI OCP

Niljai colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	129	79	23	12	9
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
Taroda Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	379	153	24	23	17
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
Civil office -Niljai					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	262	90	35	14	10
Permissible Limits	600	300	60	120	120
# - Above Std. Value.					

Workshop (ETP) of NOCM - I					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
22/04/2019	180	58	48	9	7
Permissible Limits	600	300	60	120	120

- Above Std. Value.

FUGITIVE DUST MONITORING DATA


WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

CHP			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-42 Date of Issue:15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter : WCL/HQ/ENV/17-
 Ref. No. : K/520-522 DATED-
 18.04.19

Sample Description: Water sample
 No. of pages : 1 2

EFFLUENT WATER QUALITY REPORT


1NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : WANI MONTH : APRIL
 NAME OF THE PROJECT : NILJAI OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
22/04/2019	7.50	36	30	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
22/04/2019	7.90	44	48	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
S.T.P. (Domestic Effluent) - Treated Water				
Date of Sample Collection	Analysis Results			
	TSS (mg/l) IS-3025/17:1984		BOD (3 days 27°C) mg/l	
Below Detection Limit	10		2	
22/04/2019	52		12	
TLV as per Env.(Protection) Amendment rule 2000	100		30	

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-42A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CWSTADALI MONTH : APRIL
 NAME OF THE PROJECT : CWSTADALI Sampling Date : 23/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.20	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:1983 EDTA	4.0	296	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	68	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.68	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	604	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	59.2	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	36.11	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	184	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	14	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-42A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd EditionCarmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	140	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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- Note: 1) This Report refers to the values related to the items tested as received.
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 3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH. : APRIL
NAME OF THE PROJECT : NILJAI OC

Name of the Location : CHP – Niljai OC - WNON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	21/04/2019	63.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : CHP – Niljai (S) OC - WNON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	21/04/2019	64.3
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - WNON-3

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	21/04/2019	42.2
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

PENGANGA OC

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014**

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INTRODUCTION

Location :

Penganga Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The project is well connected by all weather road with Wani and also approachable by fair weather road from Ghugus.

Drainage :

Drainage of the area is controlled by Wardhariver and Penganga river.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above mentioned industries and the busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
--------------	-------------------------	----------------------

Fugitive Dust Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
--------------	-------------------------	----------------------

1.	WrokShop	- WPOAF-1
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Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
--------------	-------------------------	----------------------

1.	Mine water discharge	- WPOW-1
----	----------------------	----------

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
--------------	-------------------------	----------------------

1.	Workshop	- WPON-1
----	----------	----------

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5

m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

- PM-2.5 :** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x :** Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂ :** Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water :** Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise :** Noise level data are recorded fortnightly.

Near Mine					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
19/04/2019	108	57	29	9	7
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Virur Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
19/04/2019	228#	116#	24	18	13
20/04/2019	396#	257#	57	39	28
26/04/2019	350#	261#	59	40	28
27/04/2019	358#	257#	58	39	28
Permissible Limits	200	100	60	80	80

- Above Std. Value

FUGITIVEDUSTMONITORING DATA

1. Workshop


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
26/04/2019	376	265	46

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

-
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	
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Test Report NO : RIN/TR/APRIL-19/W-43 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur Sampling method :
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH. : APRIL
 NAME OF THE PROJECT : PENGANGAOCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
18/04/2019	7.60	40	38	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
 (Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH : APRIL
NAME OF THE PROJECT : PENGANGA OC

Name of the Location : Workshop - WPON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	18/04/2019	55.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

AMBARA OC

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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INTRODUCTION

Location :

Ambara OC Project is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The Project is connected with Chhindwara by State Highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 5 kms from Junardeo station.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- KAOA – 1
2.	Pit Office (Mohan)	- KAOA – 2
3.	Colony	- KAOA – 3
4.	Ambara village	- KAOA -- 4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- KGOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- KMUW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- KAON-1
2.	Colony (Mohan)	- KAON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-76 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : AMBARA OC

Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	275	137	24	36	25
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Pit Office – Mohan					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	193	149	45	23	16
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Colony- Health Center					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	259*	168	14	26	18
Permissible Limits	200	100	60	80	80
# - Above Std. Value					

Ambara village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
29/04/2019	179	71	6	11	8
Permissible Limits	200	100	60	80	80

- Above Std. Value


FUGITIVE DUST MONITORING DATA

CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL19/W-76 Date of Issue : 15/04/2019
Name of the Customer: WCL, Nagpur
Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : AMBARA OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
-	-	-	-	-
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

#-Below Std.value.

(Scientific Assistant)

***Deepanshu Sahu
(Authorized Signatory)***

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : AMBARA OC

Name of the Location : Manager Office - KAON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	50.3
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Mohan) - KAON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	43.8
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

AMBARA UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
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3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Ambara UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

Ambara UG Project is connected by road with Chhindwara State highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 12 kms from Junardeo station.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office - Ambara	-	KAUA-1
2.	Pit Office (Mohan)	-	KAUA-2
3.	Colony	-	KAUA-3
4.	Ambara village	-	KAUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KAUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	KAUN-1
2.	Colony	-	KAUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (RPM), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust

Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size $>10 \mu$) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (RPM) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.


NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Due to non-availability, mine water discharge could not be monitored during this month.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-77 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : AMBARA UG

SAM Office- Ambara					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	134	100	34	15	11
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Pit Office – Mohan					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	193	149	45	23	16
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Colony- Health Center					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	259	168	14	26	18
Permissible Limits	200	100	60	80	80

Ambara village

DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
29/04/2019	179	71	6	11	8
Permissible Limits	200	100	60	80	80

- Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

-
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3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : AMBARA UG

Name of the Location : Colony - KAUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	43.8
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

AREA WORKSHOP

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Area Workshop is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Workshop Premises	- KAWN-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.


- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field

and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Due to some un-avoidable reason, air quality data could not be monitored during this month.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-80 Date of Issue : 15/06/2019
Name of the Customer: WCL, Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
No. of pages : 1

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : AREA WORKSHOP


Area Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	43	40	12	6	5
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

#-Above Std.value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-80A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : AREA WORKSHOP Sampling Date : 25/04/2019
 NAME OF LOCATION : DRINKING WATER FROM CANTEEN

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.70	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	60	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	22	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.03	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	110	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	19.2	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	2.76	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	10.09	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	0.56	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-80A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd EditionCarmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	68	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : AREA WORKSHOP

Name of the Location : Workshop Premises - KAWN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	50.1
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

DAMUA OC

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014**

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2.	AIR QUALITY MONITORING DATA	3-4
3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Damua OC Project is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The Project is connected with Chhindwara by State Highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 5 kms from Junardeo station.

Drainage :

Drainage of the area is mainly controlled by Kanhan river and Bhor nalla (a tributary of Kanhan river).

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office (Damua)	-	KDOA-1
2.	OC Office	-	KDOA-2
3.	Rescue Station (Near Incline 24 & 25)	-	KDOA-3
4.	Nandora village	-	KDOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KDOW-1

Noise Level Monitoring Data

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Manager office	-	KDON-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM),

Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Due to non-availability, mine water discharge could not be monitored during this month.

- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-86 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : DAMUA OC

SAM Office- Damua					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	217	141	27	22	15
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
OC office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	123	87	17	13	10
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Rescue station(near incline 24 & 25)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	320	198	59	30	21
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
#-Above std.value					

Nandora Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
29/04/2019	48	42	38	7	5
Permissible Limits	200	100	60	80	80

#-Above std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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ENVIRONMENTAL MONITORING REPORT

DAMUA UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

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3.	DRINKING WATER QUALITY MONITORING DATA	4-5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Damua UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The Project is connected with Chhindwara by State Highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 5 kms from Junardeo station.

Drainage :

Drainage of the area is mainly controlled by Kanhan river and Bhor nalla (a tributary of Kanhan river).

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office (Damua)	-	KDUA-1
2.	Rescue Station (Near Incline 24 & 25)	-	KDUA-2
3.	Nandora village	-	KDUA-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KDUW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan House	-	KDUN-1
2.	Colony	-	KDUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Due to non-availability, mine water discharge could not be monitored during this month.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-81 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : DAMUA UG


SAM Office- Damua					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	217	141	27	22	15
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Rescue station(near incline 24 & 25)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	320	198	59	30	21
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Nandora Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	48	42	38	7	5
Permissible Limits	200	100	60	80	80

#-Above Std. Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-81A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : DAMUA UG Sampling Date : 28/04/2019
 NAME OF LOCATION : **DRINKING WATER FROM SAM OFFICE**

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.40	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	128	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	52	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	1.42	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	230	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	36.8	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	8.74	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	20.72	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	0.09	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-81A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	152	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH. : APRIL
NAME OF THE PROJECT : DAMUA UG

Colony - KDUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	46.8
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

GHORAWARI OC

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Ghorawadi OC Project is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office-Ghorawadi OC	- KGOA-1
2.	SAM Office (Ghorawari)	- KGOA-2
3.	Colony	- KGOA-3
4.	Panara village	- KGOA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Palachauri siding	- KGOA-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- KGON-1
2.	Colony	- KGON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-72 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : GHORAWADI OC

Manager Office -OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	77	36	15	6	4
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
SAM Office - Ghorawari					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	162	82	6	13	9
TLV as per Env.(Protection) Amendment Rule 2000	600	300	120	120	60
Colony- Health Center Jharna					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	135	75	11	12	8
Permissible Limits	200	100	60	80	80

Panara village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
28/04/2019	100	52	13	8	6
Permissible Limits	200	100	60	80	80

FUGITIVE DUST MONITORING DATA

Palachauri Siding.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH. : APRIL
NAME OF THE PROJECT : GHORAWARI OC

Name of the Location : Manager Office - KGON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	46.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - KGON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	47.3
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

JHARNA UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Jharna / Ghorawadi UG Project is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office - Jharna UG	-	KJUA-1
2.	SAM Office (Ghorawari)	-	KJUA-2
3.	Colony	-	KJUA-3
4.	Panara village	-	KJUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KJUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	KJUN-1
2.	Colony	-	KJUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust

Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size $>10 \mu$) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-82 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NOx(06:2006), SO₂(02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : JHARNA UG

Manager Office - Jharna UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM2.5	NOx	SOx
28/04/2019	267	200	13	30	22
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
SAM Office – Ghorawari					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM2.5	NOx	SOx
28/04/2019	162	82	6	13	9
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Colony- Health Center Jharna					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM2.5	NOx	SOx
29/04/2019	135	75	11	12	8
Permissible Limits	200	100	60	80	80
#-Above std.value					


Panara village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM2.5	NOx	SOx
28/04/2019	100	52	13	8	6
Permissible Limits	200	100	60	80	80

#-Above std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-82 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : JHARNA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
27/04/2019	7.2	36	34	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
 (Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-82A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : JHARNA UG Sampling Date : 28/04/2019
NAME OF LOCATION : DRINKING WATER FROM DISPENSARY.

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.50	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	164	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	40	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	1.16	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	230	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	35.2	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	18.46	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	12.17	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	1.01	45	No relaxation


Test Report No. RIN/TR/APRIL-19/W-82A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	148	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-82B Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : JHARNA UG Sampling Date : 28/04/2019
NAME OF LOCATION : DRINKING WATER FROM MANAGER OFFICE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.20	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	484	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	46	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	0.04	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.70	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	580	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	121.6	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	43.74	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	40.66	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	2.19	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-82B

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.011	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	92	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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- Note: 1) This Report refers to the values related to the items tested as received.
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 3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : JHARNA UG

Name of the Location : Near Fan House - KJUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	61.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - KJUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	47.3
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

MOHAN (MAORI) UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL -2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Mohan / Maori UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The Project is connected with Chhindwara by State Highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 5 kms from Junardeo station.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office - Ambara	-	KMUA – 1
2.	Pit Office (Mohan)	-	KMUA – 2
3.	Colony	-	KMUA – 3
4.	Ambara village	-	KMUA - 4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	KMUN-1
2.	Colony	-	KMUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Recommendations :

- Water 1. Mine discharge is required to be treated properly to maintain pH before discharging into natural water course or on surface.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-78 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : MOHAN / MAORI UG

SAM Office- Ambara					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	134	100	34	15	11
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Pit Office - Mohan					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	193	149	45	23	16
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Colony- Health Center					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	259	168	14	26	18
Permissible Limits	200	100	60	80	80
#-Above std.value					


Ambara village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
29/04/2019	179	71	6	11	8
Permissible Limits	200	100	60	80	80

#-Above std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-78 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : MOHAN / MAORI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
29/04/2019	7.5	32	30	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

- Below Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : MOHAN / MAORI UG

Name of the Location : Near Fan House - KMUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	22/04/2019	63.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - KMUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	43.8
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

NANDAN UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

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JARIPATKA, NAGPUR, PIN – 440014**

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4.	DRINKING WATER QUALITY MONITORING DATA	6-7
5.	NOISE LEVEL DATA	8

INTRODUCTION

Location :

Nandan UG Project is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The area is served by an all weather metalled road from the distt. Headquarter at Chhindwara. The nearest rail head is Hirdagarh broad gauge branch line at a distance of 15-16 km.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office (Nandan-I UG)	-	KNUA-1
2.	Pit Office (Nandan-II UG)	-	KNUA-2
3.	Health center (Nandan UG)	-	KNUA-3
4.	Nandan Water Filter Plant	-	KNUA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge (Nandan UG-II)	-	KNUW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house (Nandan-II UG)	-	KNUN-1
2.	Colony	-	KNUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non – respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles.


These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters – pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-83 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), Nox(06:2006), SO₂(02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : NANDAN UG

SAM Office- Nandan I UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
27/04/2019	110	57	23	9	6
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Pit Office- Nandan II UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
27/04/2019	122	47	13	8	5
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Health center – Nandan UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
26/04/2019	134	89	60	14	10
Permissible Limits	200	100	60	80	80
# Above Std. Value.					


Nandan water filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
26/04/2019	92	82	24	13	9
Permissible Limits	200	100	60	80	80

- Above std. value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-83 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : NANDAN UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
25/04/2019	7.6	40	48	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-83A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : NANDAN UG Sampling Date : 25/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.30	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	488	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	56	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.91	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	590	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	118.4	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	46.65	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	0.031	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	30.67	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	3.09	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-83A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.010	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	84	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : NANDAN UG

Name of the Location : Fan house-Nandan-II UG - KNUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	28/04/2019	67.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - KNUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	42.8
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

NANDAN WASHERY

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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INTRODUCTION

Location :

Nandan Washery is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The area is served by an all weather metalled road from the distt. headquarter at Chhindwara. The nearest rail head is Hirdagarh broad gauge branch line at a distance of 15-16 km.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Sub-station	- KNWA-1
2.	Guest House	- KNWA-2
3.	SAM Office - Nandan – I UG	- KNWA-3
4.	Nandan – Water Filter Plant	- KNWA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	
1.	Effluent Treatment Plant	- KNWW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Washery	- KNWN-1
2.	Colony	- KNWN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles.

These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom.


The fine dust forming the respirable fraction (size < 10 µ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (µg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Effluent water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-84 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : NANDAN WASHERY

Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
26/04/2019	102	90	48	14	10
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Guest House					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
26/04/2019	120	95	37	15	11
Permissible Limits	200	100	60	80	80
SAM Office- Nandan I UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	110	57	23	9	6
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

Nandan water filter plant


DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
26/04/2019	92	82	24	13	9
Permissible Limits	200	100	60	80	80

- Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-84 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : KANHAN MONTH APRIL
 NAME OF THE PROJECT : NANDAN WASHERY

Effluent Treatment Plant				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
25/04/2019	7.3	44	50	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-84A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : NANDAN WASHERY Sampling Date : 25/04/2019
NAME OF LOCATION : DRINKING WATER FROM GUEST HOUSE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.40	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	280	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	74	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	077	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	390	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	57.6	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	33.03	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	21.12	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	1.10	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-84A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	88	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : NANDAN WASHERY

Name of the Location : Washery - KNWN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	28/04/2019	50.3
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - KNWN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	28/04/2019	40.3
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

TANDSI UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Tandsi UG is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The project is connected by 3 kms of Forest road to Rampur-Bhata village, then by 22 kms of fair weather road to Damua and further by 16 kms of metalled road to Dungaria, head quarter of Kanhan area of WCL. Nearest railway station is Nanegaon at a distance of 19 kms from Tandsi block on broad gauge branch line of Central Railway.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Workshop	-	KTUA-1
2.	JET Hostel	-	KTUA-2
3.	Lamp Room	-	KTUA-3
4.	Colony	-	KTUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KTUW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	KTUN-1
2.	Colony	-	KTUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower.

As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom.

The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.


Colony-Near Health Center					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
25/04/2019	314	167	54	25	18
Permissible Limits	200	100	60	80	80

#- Above Std. Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	<p style="text-align: center;">Test Report</p>	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-85 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : TANDSI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
24/04/2019	7.6	36	32	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-85A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : TANDSI UG Sampling Date : 28/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	1	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.50	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	88	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	56	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.91	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	210	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	9.6	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	15.52	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	27.38	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	1.88	45	No relaxation


Test Report No. RIN/TR/APRIL-19/W-85A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	164	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-85B Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : APRIL
 NAME OF THE PROJECT : TANDSI UG Sampling Date : 28/04/2019
 NAME OF LOCATION : DRINKING WATER FROM CANTEEN

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.60	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	492	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	24	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.59	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	600	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	52.8	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	32.07	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	61.17	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	2.91	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-85B

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	132	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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- Note: 1) This Report refers to the values related to the items tested as received.
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 3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : APRIL
NAME OF THE PROJECT : TANDSI UG

Name of the Location : Near Fan House - KTUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	62.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - KTUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	46.3
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

SARNI UG

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

SarniUG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathakhera Area of Western Coalfields Limited.

Communication :

The Project is connected by an all weathermetalled road with Ghoradongri railway station of Central Railway. It is on the Nagpur-Itarasi section of Delhi - Chennai G.T.road.

Drainage :

The drainage of the area is mainly controlled by Tawariver.

Climate :

The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Industries :

Besides other coalmines, other major industry in the vicinity of the project site is Satpura Thermal Power Station (STPS) of MPEB, which is expected to influence the pollution level of the area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CGM Office (Near entrance gate room) -	P _k SUA-1
2.	Near Dy. CME Office) -	P _k SUA-2
3.	Pathakhera Colony -	P _k SUA-3
4.	Substation Sarni UG -	P _k SUA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP =	P _k SUAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge -	P _k SUW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan House -	P _k SUN-1
2.	Colony -	P _k SUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-59 Date of Issue : 15/06/19
Name of the Customer: WCL, Nagpur
Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
522 DATED-18.04.19 Sample Description : Air sample
No. of pages : 2
Test Required : IS-5182 [PM-10(04:1999),NO_x (06:2006),SO₂ (02:2001)]
& SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PATHAKHERA MONTH : APRIL
NAME OF THE PROJECT : SARNI UG

CGM Office(near entrance gate room)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	216	132	56	20	14
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Near Dy. CME Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	116	97	24	15	11
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Pathakhera Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	123	83	24	13	9
Permissible Limits	200	100	60	80	80

-Above Std Value


Substation Sarni UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
24/04/2019	318	145	31	22	16
Permissible Limits	200	100	60	80	80

#-Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-59 Date of Issue : 15/06/2019
Name of the Customer: WCL, Nagpur
Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR: 2019
NAME OF THE AREA : PATHAKHERA MONTH: APRIL
NAME OF THE PROJECT : SARNI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
23/04/2019	7.32	36	26	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PATHAKHERA MONTH. : APRIL
NAME OF THE PROJECT : SARNI UG

Name of the Location : Near Fan House- P_KSUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	22/04/2019	65.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony- P_KSUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	22/04/2019	47.8
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

SHOBHAPUR UG

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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5.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Shobhapur UG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathakheda Area of Western Coalfields Limited.

Communication :

The Project is connected by an all weather metal road from Nagpur which is at a distance of 240 km. Betul, District head quarter, lies 60 kms, away from this project. Ghoradongri is the nearest railway station, about 20 kms from this project.

Drainage :

The drainage of the area is mainly controlled by Tawa River. RET nalla is the most important drainage course running through the area flowing into Tawa river. A no. of small nalla and gullies connect RET nalla.

Climate :

The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Industries :

Besides other coal mines, other major industries in the vicinity of the project site is Satpura Thermal Power Station (STPS) of MPEB, which is expected to influence the pollution level of the area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office	-	P _K S _B UA-1
2.	Shobhapur Colony	-	P _K S _B UA-2
3.	ShobhapurVillageh	-	P _K S _B UA-3
4.	Substation	-	P _K S _B UA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	P _K S _B UAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	P _K S _B UW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Fan House	-	P _K S _B UN-1
2.	Colony	-	P _K S _B UN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter(TPM), Respirable Particulate Matter(PM-10), Sulphur di-oxide(SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size<10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC - 7102</p>
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Test Report NO : RIN/TR/APRIL-19/W-60 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2
 Test Required : IS-5182 [PM-10(04:1999),NOx (06:2006),SO₂ (02:2001)]
 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH. : APRIL
 NAME OF THE PROJECT : SHOBHAPUR UG

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
22/04/2019	147	70	49	11	8
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Shobhapur Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
22/04/2019	105	67	17	10	8
Permissible Limits	200	100	60	80	80
Shobhapur Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
22/04/2019	109	39	37	6	5
Permissible Limits	200	100	60	80	80

- Above Std. Value

Substation					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NOx	SOx
22/04/2019	186	103	41	16	11
Permissible Limits	600	300	60	120	120


FUGITIVE DUST MONITORING DATA

1. CHP (24 hourly values in $\mu\text{g}/\text{m}^3$)			
Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-60 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR: 2019
 NAME OF THE AREA : PATHAKHERA MONTH APRIL
 NAME OF THE PROJECT : SHOBHAPUR UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
21/04/2019	7.44	44	34	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-60A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH : APRIL
 NAME OF THE PROJECT : TAWA-II UG Sampling Date : 23/04/2019
 NAME OF LOCATION : DRINKING WATER FROM GM OFFICE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	3	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.80	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	88	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl) - mg/l	IS-3025/32:1988, Argentometric	2.0	148	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.91	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	215	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	22	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	8	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	59	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	3	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-60A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd EditionCarminc	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	88	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PATHAKHERA MONTH: APRIL
NAME OF THE PROJECT : SHOBHAPUR UG

Name of the Location : Near Fan house - P_KS_BUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	21/04/2019	63.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - P_KS_BUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	21/04/2019	43.7
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

TAWA-II UG EXPN.

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Tawa - II UG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathakhera Area of Western Coalfields Limited.

Communication :

The Project is at a distance of about 30 kms from Baretha which lies on Nagpur - Bhopal road. The nearest railway station is Ghoradongri on New Delhi - Madras branch of Central Railway which is about 26 km from the Project.

Drainage :

The drainage of the area is mainly controlled by Tawa river. A number of seasonal nullahs also flow through the area

Climate :

The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Industries :

Besides other coalmines, other major industries in the vicinity of the project site are Satpura Thermal Power Station (STPS) of MPEB, which is expected to influence the pollution level of the area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office – Tawa – II UG	-	P _K T ₂ UA-1
2.	Hira palla/Bhgaikhaapa village	-	P _K T ₂ UA-2
3.	MPEB colony	-	P _K T ₂ UA-3
4.	SAM Office	-	P _K T ₂ UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	P _K T ₂ UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	P _K T ₂ UN-1
2.	Colony	-	P _K T ₂ UN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler and Fine Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x), PM-2.5 etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower.

As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.


NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

PM-2.5 Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly with Sound Level Meter..

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-61 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522
 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NOx (06:2006),SO₂ (02:2001)], SPM* & PM-2.5

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH. : APRIL
 NAME OF THE PROJECT : TAWA -II UG


Manager office- Tawa II					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
23/04/2019	221	112	44	17	12
TLV	600	300	60	120	120
Hira palla/Bhgaikhaapa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
23/04/2019	88	74	40	11	8
TLV	200	100	60	80	80
MPEB Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
23/04/2019	134	84	45	16	11
TLV	200	100	60	80	80

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	150	98	27	15	11
TLV	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-61 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH : APRIL
 NAME OF THE PROJECT : TAWA-II UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
22/04/2019	7.47	28	24	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-61A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH : APRIL
 NAME OF THE PROJECT : TAWA-II UG Sampling Date : 23/04/2019
NAME OF LOCATION : DRINKING WATER FROM GM OFFICE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.60	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	96	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	40	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.89	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	220	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	30	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	5	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	65	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	5	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-61

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	96	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PATHAKHERA MONTH.: APRIL
NAME OF THE PROJECT : TAWA-II UG

Name of the Location : Near Fan House - P_KT₂UN-1

Month	Date of Data collection	Noise Level in dB(A)
APRIL.2019	23/04/2019	63.3
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - P_KT₂UN-2

Month	Date of Data collection	Noise Level in dB(A)
APRIL.2019	23/04/2019	48.3
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

TAWA UG

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

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INTRODUCTION

Location :

Tawa UG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathakhera Area of Western Coalfields Limited.

Communication :

The Project is at a distance of about 30 kms from Baretha which lies on Nagpur - Bhopal road. The nearest railway station is Ghoradongri on New Delhi - Chennai branch of Central Railway which is about 26 km from the Project.

Drainage :

The drainage of the area is mainly controlled by Tawa river. A number of seasonal nallahs also flow through the area

Climate :

The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Industries :

Besides other coalmines, other major industries in the vicinity of the project site are Satpura Thermal Power Station (STPS) of MPEB, which is expected to influence the pollution level of the area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office- Tawa II	-	P _K TUA-1
2.	Hirapalla/Bhgaikhapa village	-	P _K TUA-2
3.	MPEB colony	-	P _K TUA-3
4.	SAM Office	-	P _K TUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	P _K TUW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	P _K TUN-1
2.	Colony	-	P _K TUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Due to non-availability, mine water discharge could not be monitored during this month.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-37A Date of Issue : 15/06/19
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NOx (06:2006),SO₂ (02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH : APRIL.
 NAME OF THE PROJECT : TAWA UG

Manager office- Tawa II					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	221	112	44	17	12
TLV	600	300	60	120	120
Hira palla/ Bhgaikhaapa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	88	74	40	11	8
TLV	200	100	60	80	80
MPEB Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	134	84	45	16	11
TLV	200	100	60	80	80


SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	150	98	27	15	11
TLV	600	300	60	120	120

- Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-37A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH : APRIL
 NAME OF THE PROJECT : TAWA UG Sampling Date : 22/04/2019
NAME OF LOCATION : DRINKING WATER FROM GUEST HOUSE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.30	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	116	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	60	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.88	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	230	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	37	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	6	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	35	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	6	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-62

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	92	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PATHAKHERA MONTH : APRIL
NAME OF THE PROJECT : TAWA UG

Name of the Location : Near Fan House - P_KTUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	61.9
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - P_KTUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	48.3
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

CHATTARPUR-I & II UG

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL- 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Chattarpur - I & II UG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathekhera Area of Western Coalfields Limited.

Communication :

Ghoradongri is the nearest railway station at 71 km South of Itarsi junction. The project can be approached by road of about 16 km from Ghoradongri railway station.

Drainage :

Drainage is mainly controlled by two / three drains, which drains into the Tawa river.

Climate :

The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chattarpur village	P _K CUA-1
2.	SAM Office	P _K CUA-2
3.	Substation- Chattarpur I UG	P _K CUA-3
4.	Substation- Chattarpur II UG	P _K CUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge- Chattarpur-I UG	P _K CUW-1
2.	Mine water discharge- Chattarpur-II UG	P _K CUW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan House- Chattarpur-I UG	P _K CUN-1
2.	Near Fan House- Chattarpur-II UG	P _K CUN-2
3.	Colony	P _K CUN-3

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler

through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size $>10 \mu$) is separated from the air stream by centrifugal forces acting on the solid particles.

These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.


PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule- VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-59 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x (06:2006),SO₂ (02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH : APRIL
 NAME OF THE PROJECT : CHATTARPUR-I & II UG

Chattarpur village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	66	24	8	4	3
Permissible Limits	200	100	60	80	80
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	31	19	7	3	3
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Substation- Chattarpur I UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	52	39	13	6	5
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

#Above Std.value


Substation- Chattarpur II UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	67	27	15	5	3
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

#Above Std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-59 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : PATHAKHERA MONTH. APRIL
 NAME OF THE PROJECT : CHATTARPUR-I & II UG

Mine water discharge (Chattarpur I UG)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
21/04/2019	7.27	44	38	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
Mine water discharge (Chattarpur II UG)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
21/04/2019	7.55	40	32	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PATHAKHERA MONTH: APRIL
NAME OF THE PROJECT : CHATTARPUR-I & II UG
Name of the Location : Fan House (Chattarpur I UG) - P_KCUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	20/04/2019	62.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Fan House (Chattarpur II UG) - P_KCUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	20/04/2019	61.3
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - P_KCUN-3

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	20/04/2019	47.3
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

BARKUHI OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Barkuhi OC is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Pench river.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities, vehicular traffic etc also contribute to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Central school	- PBOA-1
2.	Manager Office	- PBOA-2
3.	SAM Office	- PBOA-3
4.	Chandameta Workshop	- PBOA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- PBOW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Barkuhi hospital	- PBON-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-63 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NO_x (06:2006),SO₂ (02:2001)] PM-2.5 &SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : BARKUHI OC


Central school					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	165	80	12	12	9
Permissible Limits	200	100	60	120	120
Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	313	111	28	17	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	253	143	7	22	16
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
# Above Std, value					

Chandameta Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
24/04/2019	382	154	53	24	17
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-63A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : BARKUHI OC Sampling Date : 23/04/2019
NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	7.30	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	208	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	26	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.23	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	246	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	63	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	13	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	147	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	1.342	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-63A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	108	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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ENVIRONMENTAL MONITORING REPORT

CHANDAMETA WORKSHOP

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

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INTRODUCTION

Location :

Chandameta Workshop is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Pench river.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chandameta workshop	- PCMWA-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Workshop Premises	- PCMWN-1

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction

(size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper.


The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-64 Date of Issue : 15/06/2019
Name of the Customer: WCL,Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006),SO₂ (02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH : APRIL
NAME OF THE PROJECT : CHANDAMETA W/S

Chandameta Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	382	154	53	24	17
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-64A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 :NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : CHANDAMETA W/S Sampling Date : 23/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.30	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	188	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	20	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.48	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	246	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	52	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	15	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	139	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	1.354	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-64A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	120	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.:APRIL
NAME OF THE PROJECT : CHANDAMETA WORKSHOP
Name of the Location : Near Chandameta Workshop - PCMWN-1

Month	Date of Data Collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	52.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

CHHINDA OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Chinda OC is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Pench river.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chinda OC site office	- PCOA-1
2.	SAM Office	- PCOA-2
3.	Chinda village	- PCOA-3
4.	Colony - Chinda	- PCOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- PCOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- PCON-1
2.	Colony	- PCON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

nitrogen (NO_x) etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-65 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2
 Test Required :IS-5182 [PM-10(04:1999),NOx (06:2006),SO₂ (02:2001)] ,SPM* & PM-2.5.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : CHINDA OC


Chinda OC Site					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
29/04/2019	300	190	39	29	21
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
29/04/2019	397	274	65#	42	29
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Chinda village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
29/04/2019	267#	108#	25	17	12
Permissible Limits	200	100	60	80	80
Colony – Chinda					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
28/04/2019	208#	121#	35	19	13
Permissible Limits	200	100	60	80	80

#-Aboves std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-65A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 :NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : CHINDA OC Sampling Date : 28/04/2019
 NAME OF LOCATION : DRINKING WATER FROM GUEST HOUSE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.00	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	336	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	56	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.44	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	726	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	76	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	36	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	190	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	15.12	45	No relaxation


Test Report No. RIN/TR/APRIL-19/W-65A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	260	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-64B Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 :NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : CHINDA OC Sampling Date : 28/04/2019
 NAME OF LOCATION : DRINKING WATER FROM GUEST HOUSE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.10	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	332	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	58	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.39	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	556	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	85	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	30	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	191	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	13.231	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-64B

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	228	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: APRIL
NAME OF THE PROJECT : CHINDA OC

Name of the Location : Near Manager Office - PCON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	28/04/2019	53.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Chinda) - PCON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	28/04/2019	45.8
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

GANAPATI UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location :

Ganpati UG is located in Chhindwara district of Madhya Pradesh state. The project is administered by Pench Area of Western Coalfields Limited.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Parasia Guest House	-	PGUA-1
2.	Manager office – Mahadeopuri UG	-	PGUA-2
3.	Colony –EDC Dispensary	-	PGUA-3
4.	Lamp Room	-	PGUA-3

FugitiveDust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	B.G Siding	-	PGUAF-1

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PGUW-1

Noise Level Monitoring locations :


<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Fan house	-	PGUN-1
2.	Colony	-	PGUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-67 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NOx (06:2006),SO₂ (02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH. : APRIL
 NAME OF THE PROJECT : GANPATI UG

Guest House- Parasia					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	190	127	49	20	14
Permissible Limits	200	100	60	80	80
# - Above Std. value					
Manager Office- Mahadeopuri UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	195	106	4	16	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

Colony –EDC Dispensary					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	184	86	27	13	10
Permissible Limits	200	100	60	80	80

- Above Std. value

Lamp Room					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOX	SO_x
30/04/2019	155	103	10	16	11
Permissible Limits	600	300	60	120	120

FUGITIVE DUST MONITORING DATA

1. BG siding

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

-
- Note: 1) This Report refers to the values related to the items tested as received.
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: APRIL
NAME OF THE PROJECT : GANPATI UG

Name of the Location :Near Fan house PGUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	47.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - PGUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	54.5
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

JAMUNIYA UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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4.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Jamuniya UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. It is at a distance of 1/2 km before Parasia .

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office	-	PJUA-1
2	Substation	-	PJUA-2
3.	Jamuniya Village	-	PJUA-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PJUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office	-	PJUN-1
		-	

Frequency of Monitoring :


- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid

particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size 10μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-66 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 1

Test Required : IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)] &SPM* & PM_{2.5}

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : JAMUNIYA UG


Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	212	165	51	25	18
Permissible Limits	600	300	60	120	120
Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	253	105	40	16	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Jamuniya village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
24/04/2019	193	112	40	17	12
.TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

#-Above std.value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-66 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH. : APRIL
 NAME OF THE PROJECT : JUMUNIYA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
24/04/2019	7.3	24	16	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH: APRIL
NAME OF THE PROJECT : JUMUNIYA UG
Name of the Location : Manager Office-PJUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	46.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

MAHADEVPURI UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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INTRODUCTION

Location :

Mahadeopuri UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. It is at a distance of 1/2 km before Parasia .

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Parasia Guest House	-	PMUA-1
2.	Manager Office	-	PMUA-2
3.	Lamp room (Ganapati)	-	PMUA-3
4.	Colony	-	PMUA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	EDC Siding	-	PMUAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PMUW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	PMUN-1
2.	Colony	-	PMUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-68 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)] &SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : MAHADEOPURI UG

Guest House- Parasia					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
30/04/2019	190	127	49	20	14
Permissible Limits	200	100	60	80	80
# - Above Std. value					
Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
30/04/2019	195	106	4	16	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Lamp Room					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
30/04/2019	155	103	10	16	11
.TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
# - Above Std. value					

Colony-EDC Dispensary					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	184	86	27	13	10
Permissible Limits	200	100	60	80	120
# - Above Std. value					


FUGITIVE DUST MONITORING DATA

1.EDC siding	(24 hourly values in µg/m ³)		
Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

**Deepanshu Sahu
 (Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-68 Date of Issue : 15/06/2019
Name of the Customer: WCL, Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH. : APRIL
NAME OF THE PROJECT : MAHADEOPURI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
29/04/2019	6.3	20	14	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-68A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 :NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : MAHADEOPURI UG Sampling Date : 29/04/2019
 NAME OF LOCATION : DRINKING WATER FROM GUEST HOUSE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.50	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	312	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	28	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.33	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	350	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	72	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	33	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	0.021	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	187	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	8.231	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-68A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	216	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH: APRIL
NAME OF THE PROJECT : MAHADEOPURI UG

Name of the Location : Fan house - PMUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	68.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - PMUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	46.5
.Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

NAHERIA UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Naheria UG project is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

Naheria UG Project is situated in East of Parasia town. The convenient rail heads for the project is Parasia (45 km) located on the narrow gauge line of South-Eastern Railway.

Drainage :

The drainage of area is mainly controlled by the Perennial Gunor river and Dhankasa nullah.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45° C to 27° C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Bokai Township	-	PNUA-1
2.	Naheria villege	-	PNUA-2
3.	Lamp Room / Sub-station	-	PNUA-3
4.	SAM Office	-	PNUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PNUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Fan house	-	PNUN-1
2.	Colony	-	PNUN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO₂) etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size $>10 \mu$) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-70 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NO_x (06:2006),SO₂ (02:2001)] & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : NAHERIA UG

Bokai township					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	234	181	58	28	20
PERMISSIBLE LIMIT	200	100	60	80	80
Neharia village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	190	87	28	14	10
Permissible Limits	200	100	60	80	80
Lamp Room / Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	201	101	44	16	11
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
#-AboveStd.Value					


SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
25/04/2019	279	176	63 [#]	27	19
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

#-AboveStd.Value

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-70 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : NAHERIA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
24/04/2019	7.5	36	28	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-70A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 :NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : NEHARIA UG Sampling Date : 29/04/2019
 NAME OF LOCATION : DRINKING WATER FROM GUEST HOUSE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.10	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	292	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	22	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.22	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	420	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	72	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	28	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	0.033	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	144	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	6.213	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-70A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	192	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: APRIL
NAME OF THE PROJECT : NAHERIA UG

Name of the Location : Fan house - PNUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	68.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - PNUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	24/04/2019	47.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

NEW SETHIA OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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INTRODUCTION

Location :

New Sethia OC is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Pench river.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chinda village	- PSOA-1
2.	Colony (Chinda)	- PSOA-2
3.	New Sethia OC Site	- PSOA-3
4.	SAM Office	- PSOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- PSOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- PERSON-1
2.	Colony (Chinda)	- PERSON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (RPM), Sulphur di-oxide (SO₂) and Oxides of nitrogen

(NO_x) etc.

- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (TPM) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-71 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NO_x(06:2006),SO₂(02:2001)],PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : NEW SETHIA OC

Chinda village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	267 [#]	108 [#]	25	17	12
Permissible Limits	200	100	60	80	80
Colony – Chinda					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	208 [#]	121 [#]	35	19	13
Permissible Limits	200	100	60	80	80
New Sethia OC Site					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	343	163	24	25	18
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	397	274	65 [#]	42	29
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-71 Date of Issue : 15/06/2019
Name of the Customer: WCL, Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH : APRIL
NAME OF THE PROJECT : NEW SETHIA OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
28/04/2019	7.1	24	16	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-71A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 :NAME OF THE AREA : PENCH MONTH : APRIL

NAME OF THE PROJECT :NEW SETHIA Sampling Date : 29/04/2019
 NAME OF LOCATION : DRINKING WATER FROM SAM OFFICE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.70	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	300	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	22	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.45	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	270	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	76	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	28	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	142	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	1.443	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-68A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carminine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	88	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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 3) * - Test parameter not under NABL scope.
-

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: APRIL
NAME OF THE PROJECT : NEW SETHIA OC

Name of the Location : Near Manager Office - PSON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	28/04/2019	55.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Chinda) - PSON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	28/04/2019	45.8
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

SHIVPURI OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL- 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Shivpuri OC is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Pench river.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Site Office	- PSpOA-1
2.	Chinda village	- PSpOA-2
3.	Colony-Guest House Shivpuri	- PSpOA-3
4.	Substation	- PSpOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- PSpOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- PSpON-1
2.	Colony (V.Puri)	- PSpON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air

passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles.

These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.


PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 T C- 7102
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Test Report NO : RIN/TR/APRIL-19/W-72 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NOx (06:2006),SO₂ (02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : SHIVPURI OC


Site office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
27/04/2019	173	75	22	12	8
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Chinda village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	267	108	25	17	12
Permissible Limits	200	100	60	80	80
Colony-Guest House Shivpuri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	173	98	49	15	11
Permissible Limits	200	100	60	80	80
# - Above Std. value					

Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	328	213	39	32	23
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-72 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH. : APRIL
 NAME OF THE PROJECT : SHIVPURI OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
26/04/2019	6.8	36	26	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH: APRIL
NAME OF THE PROJECT : SHIVPURI OC

Name of the Location : Near Manager Office - PS_pON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	54.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - PS_pON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	46.7
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

THESGORA & MATHANI UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location :

Thesgora & Mathani UG projects are located in Chhindwara district of Madhya Pradesh. The projects are administered by Pench Area of Western Coalfields Limited.

Communication :

The Projects are about 27 km East of Parasia town.

Drainage :

A no. of seasonal nallas flow through the area, which finally drain into Pench river and Gunar nadi.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Jhure Colony- F.Plant	- PTUA-1
2.	Manager Office-(Thesgora)	- PTUA-2
3.	SAM Office	- PTUA-3
4.	Manager Office-(Mathani UG)	- PTUA-4
5.	Mathani village	- PTUA-5

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge (Mathani UG)	- PTUW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan house (Thesgora UG)	- PTUN-1
2.	Fan house (Mathani UG)	- PTUN-2
3.	Colony	- PTUN-3

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.


Manager Office- Mathani UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
26/04/2019	183	113	37	17	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Mathani village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
26/04/2019	236	135	31	21	15
Permissible Limits	200	100	60	80	80

#-Above Std.Value

(Scientific Assistant)

*Deepanshu Sahu
 (Authorized Signatory)*

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Test Report NO : RIN/TR/APRIL-19/W-69 Date of Issue : 15/06/2019
Name of the Customer: WCL,Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH : APRIL
NAME OF THE PROJECT : THESGORA & MATHANI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
25/04/2019	7.3	32	24	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-69A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 :NAME OF THE AREA : PENCH MONTH : APRIL
 : THESGORA & MATHANI UG
 NAME OF THE PROJECT : Sampling Date : 26/04/2019
 NAME OF LOCATION : DRINKING WATER FROM SAM OFFICE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.20	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	192	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	24	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.52	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	418	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	55	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	14	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	142	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	2.734	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-69A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	152	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH: APRIL
NAME OF THE PROJECT : THESGORA & MATHANI UG

Name of the Location : Fan house (Thesgora UG) - PTUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	30/04/2019	65.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Fan house (Mathani UG) - PTUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	70.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - PTUN-3

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	46.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55

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ENVIRONMENTAL MONITORING REPORT

URDHAN OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

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REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

UrdhanOC project is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is situated in East of Parasia town. The convenient rail heads for the project is Parasia(approx. 45 km) located on the narrow gauge line of South-Eastern Railway.

Drainage :

The drainage of area is mainly controlled by the Perennial Gunorrivver and Dhankasanullah.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Urdhan Manager Office	-	PUOA-1
2.	Urdhan Village	-	PUOA-2
3.	BokaiTownship	-	PUOA-3
4.	Naheriavillage	-	PUOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PUOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Manager Office	-	PUON-1

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO₂) etc.

-
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-75 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NO_x (06:2006),SO₂ (02:2001)] PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : URDHAN OC

Urdhan Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/03/2019	183	148	52	22	16
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Urdhan village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/03/2019	239 [#]	193 [#]	66 [#]	29	20
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
Bokai township					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	234 [#]	181 [#]	58	28	20
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
#-AboveStd.Value					


Neharia village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO_x
25/04/2019	190 [#]	87	28	14	10
Permissible Limits	200	100	60	80	80

#-AboveStd.Value

(Scientific Assistant)

DeepanshuSahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-75 Date of Issue : 15/06/2019
Name of the Customer: WCL,Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH : APRIL
NAME OF THE PROJECT : URDHAN OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
25/04/2019	7.4	28	22	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

- Below Std. value

(Scientific Assistant)

**DeepanshuSahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH. : APRIL
NAME OF THE PROJECT : URDHAN OC
Name of the Location : Manager Office - PUON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	25/04/2019	54.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

VISHNUPURI-II UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Vishnupuri – II UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. It is 15 km east of Parasia Town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is controlled by Pench river. There are some seasonal nalla also flowing through the area.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chinda village Substation	- PV ₂ UA-1
2.	Shivpuri guest house	- PV ₂ UA-2
3.	Substation	- PV ₂ UA-3
4.	SAM Office	- PV ₂ UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge – Vishnupuri II UG	- PV ₂ UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan house	- PV ₂ UN-1
2.	Colony	- PV ₂ UN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

-
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- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-74 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NO_x (06:2006),SO₂ (02:2001)],PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : VISHNUPURI - II UG


Chinda village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	267	108	25	17	12
Permissible Limits	200	100	80	80	60
Colony-Guest House Shivpuri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	173	98	49	15	11
Permissible Limits	200	100	80	80	60
# - Above Std. value					
Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	328	213	39	32	23
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO_x
28/04/2019	183	105	18	16	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-74 Date of Issue : 15/06/2019
Name of the Customer: WCL, Nagpur
WCL/HQ/ENV/17-K/520-
Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH. : APRIL
NAME OF THE PROJECT : VISHNUPURI - II UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
27/04/2019	6.7	32	22	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: APRIL
NAME OF THE PROJECT : VISHNUPURI-II UG

Name of the Location : Fan house UG-II PV₂UN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	68.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony PV₂UN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	47.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

VISHNUPURI-I UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

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3.	DRINKING WATER QUALITY MONITORING DATA	5-6
4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Vishnupuri – I UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. It is 15 km east of Parasia Town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is controlled by Pench river. There are some seasonal nalla also flowing through the area.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chinda village	- PV ₁ UA-1
2.	Shivpuri guest house	- PV ₁ UA-2
3.	Substation	- PV ₁ UA-3
4.	SAM Office	- PV ₁ UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge – Vishnupuri I UG	- PV ₁ UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan house	- PV ₁ UN-1
2.	Colony	- PV ₁ UN-2

Frequency of Monitoring :


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- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
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- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-73 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NO_x (06:2006),SO₂ (02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : VISHNUPURI - I UG

Chinda village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	267	108	25	17	12
Permissible Limits	200	100	60	80	80
Colony-Guest House Shivpuri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	173	98	49	15	11
Permissible Limits	200	100	60	80	80
Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	328	213	39	32	23
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
# - Above Std. value					

SAM Office


DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	183	105	18	16	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

- Above Std. value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/APRIL-19/W-73 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 :NAME OF THE AREA : PENCH MONTH : APRIL
 NAME OF THE PROJECT : VISHNUPURI - I UG Sampling Date : 27/04/2019
 NAME OF LOCATION : DRINKING WATER FROM SAM OFFICE

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.40	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	216	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	96	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.53	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	408	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	64	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	14	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	139	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	10.421	45	No relaxation

Test Report No. RIN/TR/APRIL-19/W-73

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd EditionCarmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	152	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH: APRIL
NAME OF THE PROJECT : VISHNUPURI-I UG

Name of the Location : Fan house UG-I PV₁UN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	47.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony PV₁UN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	27/04/2019	47.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

GHONSA OC EXPN.

(WITHIN EXISTING LAND)

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Ghonsa Open Cast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is located at a distance of nearly 18 km SW of Wani township. It is approachable from Wani by a metalled, motorable road (Wani – Patan road). The nearest railway station is Wani on Majri-Rajur branch line of Central Railway.

Drainage : Vidarbha river serves as the main drainage of the area during rainy season.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Pollution due to other Sources:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- W _N GOA-1
2.	Ghonsa village	-- W _N GOA-2
3.	SAM Office/ canteen	- W _N GOA-3
4.	Guest house/ Colony	- W _N GOA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- W _N GOW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	-- W _N GON-1

Frequency of Monitoring :


Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (RPM), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (RPM) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-44 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : APRIL
 NAME OF THE PROJECT : GHONSA OC

Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	285	108	26	17	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Ghonsa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	62	44	12	7	5
Permissible Limits	200	100	60	80	80
SAM office/ Canteen					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	250	162	7	25	18
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
# - Above Std. Value					

Guest house/ Colony


DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	195	64	33	10	7
Permissible Limits	200	100	60	80	80

- Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-44 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : APRIL
 NAME OF THE PROJECT : GHONSA OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
23/04/2019	4.1	16	12	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2098
NAME OF THE AREA : WANI NORTH MONTH.: APRIL
NAME OF THE PROJECT : GHONSA OC

Name of the Location : Manager Office - W_NGON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	22/04/2019	54.9
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

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ENVIRONMENTAL MONITORING REPORT

EXPN. OF JUNAD OC

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL- 2019

Environment Laboratory
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INTRODUCTION

Location :

Junad Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is located at east of Ukni / Pimpalgaon project across Wardha river. It is connected by road from Wani town. The nearest railway head is Wani.

Drainage : The drainage of the area is controlled by Wardha river.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, there are a lot of lime kiln and fire bricks industries near the project area. Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Borgaon village	-	W _N JOA-1
2.	SAM office	-	W _N JOA-2
3.	Bhalar township	-	W _N JOA-3
4.	Ukni village	-	W _N JOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Security Post	-	W _N JOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	W _N JOW-1
2.	Workshop water discharge	-	W _N JOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Manager Office	-	W _N JON-1
2.	Colony (Bhalar)	-	W _N JON-2


Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

- Water** : Water quality is monitored on fortnightly basis.
Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur dioxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Water samples are collected on fortnightly basis in plastic zaricane and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-46 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)], PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : APRIL
 NAME OF THE PROJECT : JUNAD OCP

Borgaon village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	317	132	19	20	14
Permissible Limits	200	100	60	80	80
SAM office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
20/04/2019	182	59	31	9	7
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Bhalar township					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
25/04/2019	287	145	54	22	16
Permissible Limits	200	100	60	80	80

- Above Std. Value

Ukni village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
25/04/2019	222	98	37	15	11
Permissible Limits	200	100	60	80	80

- Above Std. Value


FUGITIVE DUST MONITORING DATA

Security Post			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

***Deepanshu Sahu
 (Authorized Signatory)***

-
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-46 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : APRIL
 NAME OF THE PROJECT : JUNAD OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
29/04/2019	7.4	32	24	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
29/04/2019	7.3	36	26	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant) **Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH. : APRIL
NAME OF THE PROJECT : JUNAD OCP

Name of the Location : Near Manager Office - W_NJON-1

Month	Date of Data Collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	55.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Bhalar)

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	43.5
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

KOLAR PIMPRI EXTN. OC

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
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INTRODUCTION

Location :

Kolar-Pimpri Opencast Project is located on the right bank of Wardha river in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by a fair weathered road with Wani town via Bhalar village in North-west and Ghughus colliery via Ukni village in south. Wani is connected to state highway 84 via Warora. Ghughus railway station is 12 km away and Wani railway station is 14 km away from the project.

Drainage : Wardha river serves as the main drainage of the area.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, there are a lot of lime kiln and fire bricks industries near the project area. Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Pimpri village	-	W _N KOA-1
2.	Rest Shelter	-	W _N KOA-2
3.	Substation-Kolarpimpri	-	W _N KOA-3
4.	Water filter plant - Pragati nagar	-	W _N KOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Weigh Bridge	-	W _N KOAF-1
2.	CHP		W _N KOAF-2
3.	Wani Rly. Sidding		W _N KOAF-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	W _N KOW-1
2.	Workshop water discharge	-	W _N KOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- W _N KON-1
2.	Colony (Pragati Nagar)	- W _N KON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

PM-2.5 Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline

hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Water samples are collected on fortnightly basis in plastic zaricane and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-48 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2
 . Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)],PM-2.5 & SPM*

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH. : APRIL
 NAME OF THE PROJECT : KOLAR-PIMPRI OCP

Pimpri village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
29/04/2019	124	35	29	6	4
Permissible Limits	200	100	60	80	80
Rest shelter					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
28/04/2019	235	120	44	19	13
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Substation-Kolarpimpri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	102	58	57	9	7
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
# - Above Std. Value					

Water filter plant - Pragati nagar					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
30/04/2019	96	78	39	12	9
Permissible Limits	200	100	60	80	80

- Above Std. Value

FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-


CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

Wani Rly. Siding			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-48 Date of Issue :15/06/19
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520- Sample Description:
 522 DATED-18.04.19 watersample
 No. of pages :1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : APRIL
 NAME OF THE PROJECT : KOLAR-PIMPRI OC


Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
28/04/2019	7.3	24	14	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
28/04/2019	7.7	20	12	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-48A Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : APRIL
 NAME OF THE PROJECT : MUGOLI OC Sampling Date : 24/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT(P NAGAR)

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	2	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.10	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:1983 EDTA	4.0	368	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	58	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.52	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	820	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	100	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	30	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	3.036	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	<0.02	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	179	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	7.831	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-48A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.013	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	148	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH : APRIL
NAME OF THE PROJECT : KOLAR-PIMRPI OCP

Name of the Location : CHP - W_NKON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	20/04/2019	61.2
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Pragati Nagar) - W_NKON-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	43.0
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

KUMBHARKHANI UG EXPN.

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	3-4
3.	NOISE LEVEL DATA	5

KUMBHARKHANI UG

Location :

Kumbarkhani UG Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is located at a distance of nearly 18 km SW of Wani township. It is approachable from Wani by a metalled, motorable road (Wani – Patan road). The nearest railway station is Wani on Majri-Rajur branch line of Central Railway.

Drainage : Vidarbha river serves as the main drainage of the area during rainy season.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Pollution due to other Sources:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Ghonsa village	- W _N KUA-1
2.	SAM office/ Canteen	- W _N KUA-2
3.	Guest house/ Colony	- W _N KUA-3
4.	Project Manager Office	- W _N KUA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- W _N KUW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan house	- W _N KUN-1
2.	Colony	- W _N KUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These

separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size 10μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.


PM-2.5 Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-45 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999),NO_x (06:2006),SO₂ (02:2001)],PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH. : APRIL
 NAME OF THE PROJECT : KUMBARKHANI UG

Ghonsa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	62	44	12	7	5
Permissible Limits	200	100	60	80	80
SAM office/ Canteen					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
22/04/2019	250	162	7	25	18
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Guest house/ Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
23/04/2019	195	64	33	10	7
Permissible Limits	200	100	60	80	80
# - Above Std. Value					

Project Manager Office

DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
23/04/2019	285	108	26	17	12
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH.: APRIL
NAME OF THE PROJECT : KUMBHARKHANI UG

Name of the Location : Near Fan House - W_NKUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	22/04/2019	46.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony –W_NKUN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	22/04/2019	42.5
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

PIMPALGAON OC

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
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Introduction

Location :

Pimpalgaon Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by a fair weathered road with Wani town via Bhalar village in North-west and Ghughus colliery via Ukni village in south. Wani is connected to state highway 84 via Warora. Ghughus railway station is 12 km away and Wani railway station is 14 km away from the project.

Drainage :

Wardha river which flows from North to west acts as the main drainage of the area and is about 2.5 km to 3 km from Pimpalgaon.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, there exist lime kiln and fire bricks industries also located around the project area. Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office	-	W _N POA-1
2.	Water Filter Plant – Pragati Nagar	-	W _N POA-2
3.	Workshop	-	W _N POA-3
4.	Borgaon Village	-	W _N POA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Weigh Bridge	-	W _N POAF-1
2.	CHP	-	W _N POAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	W _N POW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	W _N PON-1
2.	Colony (Pragati Nagar)	-	W _N PON-2

Frequency of Monitoring :


- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Due to non-availability, mine water discharge could not be monitored during this month.

- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-49 Date of Issue : 15/06/2019
 Name of the Customer: WCL, Nagpur
 WCL/HQ/ENV/17-K/520-
 Customer letter Ref. No. : 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)],PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : APRIL
 NAME OF THE PROJECT : PIMPALGAON OCP

Water filter plant - Pragati nagar					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	96	78	39	12	9
Permissible Limits	200	100	60	80	80
SAM office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	92	47	15	7	5
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
30/04/2019	67	40	20	7	5
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

Borgaon village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
25/04/2019	317	132	19	20	14
Permissible Limits	200	100	60	80	80

- Above Std. Value

FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH : APRIL
NAME OF THE PROJECT : PIMPALGAON OCP

Name of the Location : CHP - W_NPON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	62.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Pragati Nagar) - W_NPON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	29/04/2019	43.0
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

RAJUR UG/ BHANDEWADA INCLINE

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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5.	NOISE LEVEL DATA	8

INTRODUCTION

Location :

Rajur Underground Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by all weathered road with Wani-Yeotmal road State Highway.

Drainage :

Wardha river serves as the main drainage of the area.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, there are a lot of lime kiln and fire bricks industries near the project area. Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Hutment / Substation	-	W _N RUA-1
2.	Near Bandewada incline	-	W _N RUA-2
3.	Pit office	-	W _N RUA-3
4.	SAM Office	-	W _N RUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	W _N RUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	W _N RUN-1
2.	Colony	-	W _N RUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
24/04/2019	185	104	46	16	11
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-50 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 1

EFFLUENT WATER QUALITY REPORT


NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : APRIL
 NAME OF THE PROJECT : RAJUR UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
23/04/2019	7.6	28	18	<2
TLV as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-50A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : APRIL
 NAME OF THE PROJECT : MUGOLI OC Sampling Date : 20/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.00	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:1983 EDTA	4.0	380	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	26	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.03	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.34	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	910	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	112	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	24	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	0.028	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	217	200	400
16	Nitrates (as NO ₃) - mg/l	IS- 3025/34:1988Nessler's	0.5	9.124	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-50A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.021	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	208	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH: APRIL
NAME OF THE PROJECT : RAJUR UG

Name of the Location : Near Fan House - W_NRUN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	64.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony - W_NRUN-2

Month	Date of Data Collection	Noise Level in dB(A)
		Day Time
APRIL.2019	23/04/2019	42.8
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

UKNI DEEP OCP

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location :

Ukni Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by fair weathered road with Wani town in the North-west and Ghughus Colliery in the South. The Ghughus and Wani railway stations are located about 10 km away on the East bank and West bank respectively. Wani is connected to New Majri railway station (on Delhi-Madras line) by a rail bridge across the Wardha river.

Drainage : Wardha river serves as the main drainage of the area during rainy season.

Climate : The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, there are a lot of lime kiln and fire bricks industries near the project area. Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Bhalar township	- W _N UOA-1
2.	Ukni village	- W _N UOA-2
3.	Workshop premises	- W _N UOA-3
4.	Pimpri Village	- W _N UOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Weigh Bridge	- W _N UOAF-1
2.	CHP	W _N UOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- W _N UOW-1
2.	Workshop (ETP) water discharge	- W _N UOW-2
3.	DETP water discharge	- W _N UOW-3

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- W _N UON-1
2.	Bhalar Colony	- W _N UON-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules

published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

PM-2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Pimpri village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
29/04/2019	124	35	29	6	4
Permissible Limits	200	100	60	80	80

- Above Std. Value

FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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S.T.P. (Domestic Effluent) - Treated Water		
Date of Sample Collection	Analysis Results	
	TSS (mg/l) IS-3025/17:1984	BOD (3 days 27°C) mg/l
Below Detection Limit	10	2
25/04/2019	22	11.4
TLV as per Env.(Protection) Amendment rule 2000	100	30

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH: APRIL
NAME OF THE PROJECT : UKNI OCP

Name of the Location : CHP W_NUON-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	63.9
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : Colony (Bhalar)

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	26/04/2019	43.5
Permissible Limit		55

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ENVIRONMENTAL MONITORING REPORT

WANI RAILWAY SIDING

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



APRIL - 2019

Environment Laboratory
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Introduction

Location :

Wani Railway Siding is located in Wani Tahsil of Yavatmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by road with Wani town via SH 233 in North-east and Ghughus colliery via Ukni village in south-east. Wani railway siding is connected via MSH 6 to Ghughus railway station which is 24 km away from the project.

Drainage :

Wardha river which flows from North to west acts as the main drainage of the area and is about 7.5 km to 8 km from Wani Railway Siding.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, there exist market place which is also located around the project area. Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Farm House Nr. MSH6 Highway	-	W _N RSA-1
2.	Shethsri Bazar	-	W _N RSA-2
3.	Residential House Vittalwadi	-	W _N RSA-3

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Coal Stock yard	-	W _N RSN-1
2.	Nr. In charge Office	-	W _N RSN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Due to non-availability, mine water discharge could not be monitored during this month.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-49 Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Air sample
 No. of pages : 2

Test Required : IS-5182 [PM-10(04:1999), NO_x(06:2006), SO₂(02:2001)],PM-2.5 & SPM*.

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : APRIL
 NAME OF THE PROJECT : WANI RAILWAY SIDING OC

Farm House Nr. MSH6 Highway					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	104	80	13	12	9
22/04/2019	128	97	25	15	11
28/04/2019	387	178	51	27	19
29/04/2019	203	136	44	21	15
Permissible Limits	600	300	60	120	120
Shethsri Bazar					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
21/04/2019	179	49	43	8	6
22/04/2019	131	52	14	8	7
28/04/2019	249	122	27	19	13
29/04/2019	344	209	58	32	22
3TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80
#-Above Std.Value.					


Residential House Vittalwadi

DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
21/04/2019	49	39	25	6	5
22/04/2019	129	30	16	5	4
28/04/2019	90	34	27	6	4
29/04/2019	141	32	23	5	4
TLV as per Env.(Protection) Amendment Rule 2000	200	100	60	80	80

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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- Note: 1) This Report refers to the values related to the items tested as received.
2) This Report cannot be reproduced in part or full without written permission of the management.
3) * - Test parameter not under NABL scope.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/APRIL-19/W-49A Date of Issue : 15/06/2019
 Name of the Customer: WCL,Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED-18.04.19 Sample Description : Water sample
 No. of pages : 2

Test Required : IS 10500:2012

DRINKING WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : APRIL
 NAME OF THE PROJECT : WANI RAILWAY SIDING OC
 : Sampling Date : 29/04/2019
 NAME OF LOCATION : DRINKING WATER FROM FILTER PLANT

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
1	Colour (Hz)	APHA, 22 nd Edition Platinum Cobalt	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	2	8.20	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:1983 EDTA	4.0	356	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	44	250	1000
8	Residual Chlorine -mg/l (min)	APHA, 22 nd Edition DPD	0.02	<0.02	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.51	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	828	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	232	75	200
12	Magnesium (as Mg) -mg/l*	IS-3025/40:1991 EDTA	3	31	30	100
13	Copper as(Cu) -mg/l	IS-3025/42:1992 AAS-Flame	0.03	0.033	0.05	1.5
14	Manganese as (Mn)- mg/l	APHA, 22 nd Edition AAS-Flame	0.02	0.024	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	202	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	1.112	45	No relaxation

Test Report No: RIN/TR/APRIL-19/W-49A

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
17	Cadmium as (Cd)- mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.01	No relaxation
20	Arsenic (Ar)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.013	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	112	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame	0.02	<0.02	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	0.1	0.2

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH : APRIL
NAME OF THE PROJECT : WANI RLY. SIDING OC

Name of the Location : Coal Stock Yard - W_NRSN-1

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	28/04/2019	57.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75

Name of the Location : In charge Office - W_NRSN-2

Month	Date of Data collection	Noise Level in dB(A)
		Day Time
APRIL.2019	28/04/2019	43.2
Permissible Limit		55