



केवल नागपुर कोर्ट के अधिकार क्षेत्र में

वेस्टर्न कोलफील्ड्स लिमिटेड

Western Coalfields Limited

(मिनीरल कंपनी) (A Miniratna Company)
(कोल इंडिया लि. की अनुषंगी कंपनी)
(A Subsidiary of Coal India Limited)



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संदर्भ संख्या: वेकोलि/ मुख्यालय/ पर्यावरण/6-E & 20-C/ 117-119

दिनांक: २८/०१/२०१९

सेवा में,
डॉ. एस. के. श्रीवास्तव,
वैज्ञानिक - इ,
अतिरिक्त निदेशक (आइ ए),
IA-II (कोल माइनिंग) डिविजन,
भारत सरकार,
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,
इन्दिरा पर्यावरण भवन,
जोरबाग रोड, नई दिल्ली - 110 003.

विषय:- Submission of Compliance Report against 34th EAC directions in respect of Expansion of Gondgaon Extension OC with Expansion in Production Capacity from 2.50 MTPA to 3.50 MTPA in Land Area of 917 ha located in Gondgaon Village, Parseoni Tehsil, Nagpur District, Maharashtra for Amendment in EC Validity.

संदर्भ:- 1. Approved Minutes of the 34th EAC meeting held on 24-07-2018
2. EC granted by MoEF & CC vide letter No.J-11015/106/2009.IA-II (M) dated 14-03-2018.

Dear Sir,

This has reference to the above mentioned EC letter of the subject mine Expansion of Gondgaon Extension OC with expansion in production capacity from 2.50 MTPA to 3.50 MTPA in land area of 917 ha located in Gondgaon Village, Parseoni Tehsil, Nagpur District, Maharashtra was accorded by MoEF & CC vide letter dated 14-03-2018 with a validity of 1 year with specific conditions for compliance.

Subsequently, an application consisting of compliance of specific conditions was submitted to MoEF & CC through online portal vide dated 27-06-2018 for amendment in validity of EC and the project was appraised in 34th EAC meeting held on 24-07-2018. The EAC directed us to submit additional information in respect of the project.

As per the directions of 34th EAC committee, the conditions have been complied and the details are given below:

S.N	EAC Directions	Compliance Status
1	EIA studies to be carried out with one season baseline data, and the Environment Management Plan to be prepared accordingly	Condition Complied One Season baseline study carried out from Oct'18 to Jan'19 and EMP prepared which is enclosed as Annexure-A
2	Redressal of issues raised during the last public hearing conducted by the SPCB on 26 th April, 2005, along with the R&R details, if any, duly certified by the State Government	Condition Complied Redressal of issues raised during the last PH along with R & R details duly certified by MPCB is enclosed as Annexure- B
3	Public notice to be issued in leading newspapers (one national and two local) for information of the stakeholders about commencement of the project and present coal mining operations of capacity 2.50 MTPA in mine lease area of 917 ha, inviting comments and their redressal	Condition Complied Enclosed as Annexure- C

Contd..

:2:

S.N	Conditions	Compliance Status
4	Compliance status of the conditions stipulated in the environmental clearance dated 14 th March, 2018 from the Regional Office at Nagpur	Condition Complied Compliance certificate against existing EC secured from RO, MoEF & CC, Nagpur vide letter dated 21-01-2019. Enclosed as Annexure-D
5	Details of court cases and the compliance status	Condition Complied No court cases undertaking is enclosed as Annexure-E

In view of the above, it is most earnestly solicited that, our submission may kindly be considered for grant of Amendment in EC Validity for Expansion of Gondagaon OC with expansion in production capacity from 2.50 MTPA to 3.50 MTPA in land area of 917 ha.

Thanking you,

संलग्न : यथोपरि

भवदीय
कौशिक
23/01/19
महाप्रबंधक / विभागध्यक्ष (पर्यावरण)

प्रतिलिपि :

- 1) क्षेत्रीय महाप्रबंधक, नागपुर क्षेत्र, वेकोलि.
- 2) तकनिकी सचिव - निदेशक (तकनिकी) परियोजना एवं योजना, वेकोलि (मु-), नागपुर.

EIA/EMP
FOR
EXTENSION OF VALIDITY
OF
ENVIRONMENTAL CLEARANCE

(Under EIA Notification 2006

As per direction of 34th EAC dated 24/07/2018)

For

EXPANSION OF GONDEGAON EXTENSION
OPENCAST COAL MINE
(NAGPUR AREA, WCL)

(Extension of validity of EC granted vide J-11015/106/2009-IA.II(M) dated
14/03/2018 for production capacity 3.5 MTPA within EC area of 917.00 Ha)



JANUARY – 2019

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

Accreditation as EIA consultant vide NABET no/EIA/01/12/002 Dt. 31.01.2012
Re-accredited dt. 13.01.2016

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Annexure- II	Public Hearing Compliance Report
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SUBMISSION

The Environment Clearance of Gondagaon Extn. OC coal mine Expn. project for 2.50 MTPA rated capacity in a lease area of 917.00 ha, was obtained, (vide no – J-11015/106/2009-IA II (M) dated 15th July, 2009).

Further, the mining plan including mine closure plan for increase in production capacity from 2.5 MTPA to 3.5 MTPA in an ML area of 845.74 ha (within the existing EC area of 917.00 ha has been approved by WCL board in its 293rd meeting held on 31.10.2017 as communicated vide letter WCL/BD/SECTT/BM-293/2017/935 dt 10.11.2017. Project does not involve any forest land.

Subsequently, EC of Expansion of Gondagaon Extn. OC coal mine with increase in production capacity from 2.5 MTPA to 3.5 MTPA in a total area of 917.00 ha (mine lease area of 845.74 ha) with a validity of 1 year was obtained vide no. J-11015/106/2009-IA II (M) dated 14th March, 2018.

Subsequently, an application consisting of compliance of specific conditions was submitted to MoEF & CC through online portal vide dated 27-06-2018 for amendment in validity of EC i.e. for extension for validity for EC and the project was appraised in 34th EAC meeting held on 24-07-2018. The EAC directed us to submit additional information in respect of the project.

Quote:

34.9.6 The EAC, after detailed deliberations and for the present, desired for additional information in respect of the following:-

(i) EIA studies to be carried out with one season baseline data, and the Environment Management Plan to be prepared accordingly,

(ii) Redressal of issues raised during the last public hearing conducted by the SPCB on 26th April, 2005, along with the R&R details, if any, duly certified by the State Government,

(iii) Public notice to be issued in leading newspapers (one national and two local) for information of the stakeholders about commencement of the project and present coal mining operations of capacity 2.50 MTPA in mine lease area of 917 ha, inviting comments and their redressal,

- (iv) Compliance status of the conditions stipulated in the environmental clearance dated 14th March, 2018 from the Regional Office at Nagpur,
- (v) Details of court cases and the compliance status,

Unquote

As per the directions of 34th EAC committee, **one season baseline data (12 weeks) has been generated and based on which this EMP is prepared.** The compliance of other observations has been dealt separately.

CHAPTER –I: INTRODUCTION

1.1 GENERAL

The Environment Clearance of Gondagaon Extn. OC coal mine Expn. project for 2.50 MTPA rated capacity in a lease area of 917.00 ha, was obtained, (vide no – J-11015/106/2009-IA II (M) dated 15th July, 2009).

Further, the mining plan including mine closure plan for increase in production capacity from 2.5 MTPA to 3.5 MTPA in an ML area of 845.74 ha (within the existing EC area of 917.00 ha has been approved by WCL board in its 293rd meeting held on 31.10.2017 as communicated vide letter WCL/BD/SECTT/BM-293/2017/935 dt 10.11.2017. Project does not involve any forest land.

Subsequently, EC of Expansion of Gondagaon Extn. OC coal mine with increase in production capacity from 2.5 MTPA to 3.5 MTPA in a total area of 917.00 ha (mine lease area 845.74 ha) with a validity of 1 year was obtained vide no. J-11015/106/2009-IA II (M) dated 14th March, 2018.

Subsequently, an application consisting of compliance of specific conditions was submitted to MoEF & CC through online portal vide dated 27-06-2018 for amendment in validity of EC i.e. for extension for validity for EC and the project was appraised in 34th EAC meeting held on 24-07-2018. The EAC directed us to submit additional information in respect of the project.

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(iii) Public notice to be issued in leading newspapers (one national and two local) for information of the stakeholders about commencement of the project and present coal mining operations of capacity 2.50 MTPA in mine lease area of 917 ha, inviting comments and their redressal,

- (iv) Compliance status of the conditions stipulated in the environmental clearance dated 14th March, 2018 from the Regional Office at Nagpur,
- (v) Details of court cases and the compliance status,

Unquote

As per the directions of 34th EAC committee, **one season baseline data (12 weeks) has been generated and based on which this EMP is prepared.** The compliance of other observations has been dealt separately.

1.2 BRIEF HISTORY OF THE PROJECT

Gondegaon Extension Opencast Coal Mine Expansion (Amalgamated Gondegaon-Ghatrohan OC Mine) is located in the Nagpur district of Maharashtra State and is under the administrative control of Nagpur Area of Western Coalfields Ltd. Mine was opened in Kamptee- Silewara Coalfields in Nagpur district and is about 35 km from Nagpur having a approach road of 7 km on Nagpur- Jabalpur national highway and the nearest railway station is of the mine is Kanhan (almost 15 Km). The project lies between latitudes 21°14'59" N -21° 16'00"N and longitudes 79°10'22" E - 79°12'50" E. The area is covered by Survey of India Toposheet No.55 O/3. Ghatrohan block is located North-West of existing Gondegaon Opencast Mine. The average stripping ratio of the mine is 4.15 M³/Te. The project report for Gondegaon Extension Opencast Coal Mine Expansion project (Amalgamated Gondegaon Ghatrohan OC) has been approved by 273rd Board meeting on dated 03.02.2016 at WCL HQ for a total capital expenditure of Rs.238.4818 Crores (as per approved RPR Nov.2015).

A Mining Plan including mine closure plan has been approved by WCL board in its 293rd meeting on 31.10.2017 vide letter WCL/BD/SECTT/BM-293/2017/935 dt 10.11.2017 for production capacity 3.5 MTPA within existing EC area.

1.3 LOCATION & COMMUNICATION

The area under consideration lies between latitudes E 22°6' – E22° 16' and longitudes N79°11' - N79° 12'. The area is covered by Survey of India Toposheet No.55 O/3. Ghatrohan block is located North-West of existing Gondegaon Opencast mine. Amalgamated Gondegaon-Ghatrohan OC Mine is in Nagpur district of Maharashtra and is under administrative control of Nagpur Area of Western Coalfields Limited. This report envisages extension of Gondegaon OC by

amalgamation of the existing Gondagaon OC mine with adjoining Ghatrohan OC block.

The quarriable area is bounded by State high way No.233 in North, Kanhan river in West and South and incrop of Seam-I in East. The quarriable area is separated by the barrier from Inder UG to OC project.

1.4 PHYSIOGRAPHY AND DRAINAGE

The quarry area is bounded by State high way No.233 in North, Kanhan River in West and South and in crop of seam-I in East. The surface area is generally undulating with elevations ranging from 278 m to 288 m above MSL. The main drainage is controlled by Southerly flowing Kanhan River along the Western and Southern boundaries of the block. Minor seasonal streams originating within the block drain into Kanhan River. In general, the area is sloping towards South West and South.

CHAPTER –II: PROJECT DESCRIPTION

2.1 BACKGROUND OF THE PROJECT

Gondegaon Extension Opencast Coal Mine Expansion (Amalgamated Gondegaon-Ghatrohan OC Mine) is located Gondegaon Village, Parseoni Tehsil, Nagpur district of Maharashtra State and is under the administrative control of Nagpur Area of Western Coalfields Ltd.

Gondegaon Extension Opencast Coal Mine is an operating mine and it was commissioned in 1994-95 and coal extraction commenced from 1995-96.

In 2017-18, the mining plan including mine closure plan for increase in production capacity from 2.5 MTPA to 3.5 MTPA in an ML area of 845.74 ha (within the existing EC area of 917.00 ha has been approved by WCL board in its 293rd meeting held on 31.10.2017 as communicated vide letter WCL/BD/SECTT/BM-293/2017/935 dt 10.11.2017. Project does not involve any forest land.

Subsequently, EC of Expansion of Gondegaon Extn. OC coal mine with increase in production capacity from 2.5 MTPA to 3.5 MTPA in a total area of 917.00 ha (mine lease area of 845.74 ha) with a validity of 1 year was obtained vide no. J-11015/106/2009-IA II (M) dated 14th March, 2018.

2.2 GEOLOGY OF THE MINE

Gondegaon OC mine is situated in the western limb of the regional anticlinal structure of Wardha Valley coalfields.

Block Boundaries

The geological block boundaries of Gondegaon Ghatrohan block are as follows:

North	:	Subcrop of Seam-II (B)
South	:	Fault F ₉ - F ₉
East	:	200 m influence distance from borehole MKG-1.
West	:	Eastern bank of Kanhan river and Pench river.

2.3 EXPLORATION STATUS

2.3.1 The details of boreholes drilled in the quarry and surrounding area are tabulated below :

Agency	Series of Boreholes	No. of boreholes drilled	Metreage	Geological Report
IBM	KG	76	9684	Report on Detailed Exploration of Coal in Ghatrohan Sector, Kamptee coalfield, August, 1964
CMPDIL	CMKMK	7	1066	Revised Geological Report on Ghatrohan-Gondegaon Block, Kamptee Coalfield, March, 1985
MECL	MKG	33	3657.35	Geological Report on Exploration for Coal Gondegaon - Ghatrohan Block, Kamptee Coalfield, April, 1988
CMPDIL	CMKG	31	2973	Geological Note on Part of Gondegaon-Ghatrohan Block, Kamptee Coalfield, March, 1998
TOTAL		147	17380.35	

2.3.2 Borehole Density

The density of boreholes for quarriable block is 33 boreholes per square km.

2.4 GEOLOGY AND STRUCTURE OF THE BLOCK

2.4.1 Geological Formations

The formation-wise description is as follows :-

Talchirs

There are no outcrops of Talchirs in the block. Borehole MKG-29, drilled in the north-eastern part of the block, has intersected Talchirs at 119.53 m. Its thickness, as intersected in the borehole, is only 1.47 m and could be identified because of its distinct greenish coloured shale.

Barakars

Barakars are of Lower Permian age. Barakars in the block could be divided into three parts, based on the presence or absence of seams. The three parts of Barakars are Upper Barakars, Middle Barakars and Lower Barakars.

Upper Barakars

The Upper Barakars is that part which lies above the youngest Seam-V. It consists of medium to coarse grained grey sandstones.

Middle Barakars

The horizon from roof of Seam-V to the floor of Seam-I is termed as Middle Barakars. The Middle Barakars comprises of grey feldspathic sandstones, shales, carbonaceous shales and 5 seams with their individual thickness of 1 m to 10 m.

Lower Barakars

The part of Barakars lying below floor of Seam-I upto the Talchir contact is termed as Lower Barakars. It comprises mainly fine grained sandstone, shales and intercalations. It is characterized by the presence of fine garnets in dissiminated form.

Kamthis

Kamthis have been deposited on the eroded surface of Barakars and thus, there is a distinct erosional unconformity between them. Kamthis, in general, comprises friable ferruginous sandstone which is medium to coarse grained and pink in colour. It also consists of shales and variegated clays.

Soil

The area in its major central and western parts is covered with black cotton soil. In the west and in south, along the banks of Kanhan river, the alluvium in the form of sand and gravel has been noticed.

2.4.2 Faults

The block is traversed by eleven faults serially numbered as F₁ to F₁₁. The faults have been interpreted based on the difference in FRL on both sides, omission and reduction in seam thickness, etc. The description of individual faults is furnished in the following table:-

Fault No.	Strike	Amount & direction of throw	Location & Extent	Nature of evidences		
F ₁ -F ₁	NW-SE	100 m due N.E.	Lies across the central part of the block and further extends beyond the block in the East & West.	1.	Strike fault.	
				2.	Difference in FRL value on both sides of fault	
				3.	Direct evidence	
				BH No.	Seam Faulted	
				CMKG-22	All seams except	Seam-V
				CMKG-27	All seams except	Seam-V & IV (T)
				KG-8	All seams except	Seam-II(B)
				KG -57	All seams except	Seam-II(T) & (B)
				KG -50	All seams except	Seam-III(T) & (B) & II (T) & (B).
				KG -13	All seams except	Seam- III(T), IV(T) & (B)
F ₂ -F ₂	Curvilinear NW-SE to almost E-W	5-15 m southerly	Lies in Sector-I. Extends beyond the block in the west, dies out in the east near borehole Nos. KG-54 & KG-29.	1.	Difference in FRL value on either side of the fault.	
				2.	Direct evidence of faulting	
				BH No.	Seam Faulted	
				KG-54	Seam-III(T) & (B)	
F ₃ -F ₃	NE-SW	20 m due S.E.	Extends beyond Subcrop in N.E. Abuts against F ₅ in S.W.	KG-60	Seam-III(T) & (B),II(T) &(B)	
				1.	Difference in FRL value on either side of the fault.	
				2.	Direct evidence of faulting	
				BH No.	Seam Faulted	
				KG-14	Seam-III(T) & (B)	

Fault No.	Strike	Amount & direction of throw	Location & Extent	Nature of evidences	
F ₄ -F ₄	NE-SW	20 m due S.E.	Extends beyond incrop in N.E. Abuts against F ₅	1.	Difference in FRL value on either side of the fault.
				2.	Direct evidence : Seam II(B)
					Part faulted in borehole KG-3.
F ₅ -F ₅	WNW-ESE	30-40 m due south	Abuts against F ₁ in the west. Extends beyond the block in the east.	1.	Difference in FRL value on either side of the fault.
				2.	Direct evidence of faulting
				BH No.	Seam Faulted
				KG-35	Seam-II(T) & (B)
				KG-34	Seam-III(T) & (B), II(T) & (B)
F ₆ -F ₆	E-W	35 m due north	Abuts against F ₁ in the west and F ₃ in the east.	1.	Difference in FRL value on either side of the fault.
				2.	Direct evidence of faulting
				BH No.	Seam Faulted
				KG-70	Seam-II(T) & (B)
				KG-4, KG-67	Seam-V
F ₇ -F ₇	NE-SW	50-60 m due S.E.	Abuts against F ₁ in the NE. Extends beyond the block in the SW.	1.	Difference in FRL value on either side of the fault.
				2.	Direct evidence of faulting
				BH No.	Seam Faulted
				MKG-26	Seam-II(T) & (B), III(T) & (B)
F ₈ -F ₈	NNE-SSW	20.m.due SE	Abuts against fault F ₆ – F ₆ in the North & F ₁ – F ₁ in the South	1.	Oblique fault
				2.	FRL difference in BHs.KG-4 on up thrown side & KG-2 in down thrown side.
F ₉ -F ₉	E – W	20 to 60 m due S.	Joins fault F ₇ – F ₇ in the West & continuous to Inder block in the East	1.	Oblique fault
				2.	Omission of Seam-II in KG-75.
				3.	Based on sub surface data of BHs. On either side of the fault
F ₁₀ -F ₁₀	E – W	20 to 40 m due S	Joins F ₉ – F ₉ in the West and extends to Inder block in the East.	1.	Oblique fault
				2.	Level difference on either side of the fault in BH MKG-7, MKG-8 on upthrown side and CMKMK-57 & MKG-3on downthrown side.

Fault No.	Strike	Amount & direction of throw	Location & Extent	Nature of evidences	
F ₁₁ -F ₁₁	NW – SE	5 – 10 m due NE	Joins fault F1-F1 and abuts against F10-F10.	1.	Oblique fault
				2.	Based on sub surface data of BHs. On either side in BH MKG-6, KG-74, MKG-8 up thrown side and CMKMK-59 on down thrown side.
				3.	Omission of Seam-IV (T) in KG-74.

2.4.3 Strike and Dip

The strike and dip of the coal seam in the proposed area is entirely based on the sub-surface data obtained from the boreholes. The floor contours of the composite seam has been drawn at 10 m interval from which it would be seen that the amount of dip and strike direction are quite variable.

The Gondegaon-Ghatrohan Block is a part of the Kamptee - Silewara-Patansaongi Sub-basin. The general strike of beds is ESE-WNW to NW-SE. The gradient of the coal seams varies from 1 in 3.5 to 1 in 5 due SW to SSW.

2.4.3 COAL SEAM

Five coal seams which are characteristic of Kamptee Coalfield, are present in the Gondegaon-Ghatrohan block also. All these seams occur in the Middle Barakar horizon of about 100 m thickness. The seams in Kamptee Coalfield are numbered from bottom to top, the bottom-most Seam-I is the oldest, while the Seam-V, the youngest. The oldest Seam-I is found to be deposited around 100 m above the Talchir-Barakar contact. Of the five seams, Seams-II, III & IV occur in 2 to 3 split sections, while Seam-V is present as a single horizon. Seam-I is impersistent and also thin, mostly below 0.90 m thickness.

Seam-I to V occur in Gondegaon-Ghatrohan Block in nine sections, viz. Seam-I (Bottom), I (Top), II (Bottom), II (Top), III (Bottom), III (Top), IV (Bottom) {Seam-IV Bottom and IV Middle may be considered as Seam-IV Bottom due to very thin parting between them}, IV (Top) & V.

Details of Coal seam for Gondegaon OC & Ghatrohan OC are as shown in the following tables :-

Coal Seam details : Gondegaon OC

Seam with parting	Floor depth (m)		Thickness (m)		Average	Remarks
	Minimum	Maximum	Minimum	Maximum		
V	26.20 (KG-73)	137.41 (CMKMK-57)	3.80	11.32	8.5	Persistent
Parting			22.36	40.69	-	Sandstone variates
IV (Top)	35.80 (MKG-13)	165.58 (CMKMK-57)	1.13	7.25	3.3	Persistent
Parting			0.54	11.93		Sandstone variates
IV (Bottom)	31.90 (CMKMK-60)	175.91 (CMKMK-57)	4.68	13.02	7.4	Persistent
Parting			8.69	25.01		Sandstone variates
III (Bottom)	36.43 (KG-40)	205.07 (CMKMK-57)	0.55	5.71	3.7	Persistent
Parting			1.11	17.17		Shale, shaly sst.
II (Top)	31.60 (KG-23)	219.60 (CMKMK-57)	0.44	3.83	2.3	Persistent
Parting			0.50	10.07		Shale, shaly sst.
II (Bottom)	36.60 (KG-23)	224.50 (CMKMK-57)	0.39	4.40	2.5	Persistent

Coal Seam details : Ghatrohan OC

Seam with parting	Floor depth (m)		Thickness (m)		Average	Remarks
	Minimum	Maximum	Minimum	Maximum		
V	23.25 (CMKG-7)	121.65 (MKG-30)	5.75	10.51	9.00	Persistent
Parting			25.16	34.45		Sandstone variates
IV (Top)	25.56 (KG-62)	160.80 (MKG-30)	1.44	6.52	2.00	Persistent
Parting			1.12	15.79		Shaly sandstone, shale, intercalation of sst. and shale
IV (Bottom)	31.70 (KG-51)	173.51 (MKG-30)	1.90	10.64	6.00	Persistent
Parting			23.47	31.55		Sandstone variates
III	28.11	159.45	0.65	7.10	4.00	Persistent

(Bottom)	(CMKG-30)	(CMKG-19)				
Parting			3.08	9.34		Shale, shaly sst.
II (Top)	31.60 (KG-23)	168.10 (CMKG-19)	0.48	3.90	2.00	Persistent
Parting			0.27	6.29		Shale, shaly sst.
II (Bottom)	34.00 (CMKG-28)	173.62 (CMKG-19)	0.41	5.00	2.00	Persistent

2.5 QUALITY PARAMETERS

Seam-wise quality details of Gondegaon OC are as shown in the following table:-

SEAMWISE COAL QUALITY WITHOUT DILUTION						
Seams	Gondegaon OC			Ghatrohan OC		
	Effective thickness (m)	Seam Section-wise Weighted Av. GCV (kCal/kg)	Combined Seam-wise Weighted Av. GCV (kCal/kg)	Effective thickness (m)	Seam Section-wise Weighted Av. GCV (kCal/kg)	Combined Seam-wise Weighted Av. GCV (kCal/kg)
V	8.02	4305	4305	7.21	4528	4528
IV-TOP	3.37	4567	4790	3.10	4314	4709
IV BOTTOM	6.77	4894		5.09	4902	
III-TOP	1.58	5033	5659			5713
III BOTTOM	3.43	5761		3.07	5713	
II-TOP	2.36	5598	5596	1.85	5598	5661
II BOTTOM	2.28	5592		2.63	5707	

2.6 GEOLOGICAL RESERVES

The boundaries of Gondegaon Ghatrohan geological block are as follows :

- North : Subcrop of Seam-II (B)
- South : Fault F₉- F₉
- East : 200 m influence distance from borehole MKG-1.
- West : Eastern bank of Kanhan river and Pench river.

The sectors for reserves estimation in Gondegaon-Ghatrohan Block have been demarcated mainly on the basis of faults. The boundaries of these sectors are described below:

Sectors	Sector Boundaries
I	Subcrop of Seam-II (Bottom), Pench River, Faults F ₁ , F ₃
II	Subcrop of Seam-II (Bottom), Kanhan River, Faults F ₁ , F ₇
III	Subcrop of Seam-II (Bottom), Faults F ₃ , F ₅ F ₄
IV	Subcrop of Seam-II (Bottom), to Faults F ₄ , F ₅
V	Faults F ₅ , F ₆
A5	Fault F1-F1, F6-F6 and the limit of the Subcrop of seam
A6	Fault F1-F1, F11-F11, F10-F10 and the limit of the Subcrop of seam
A7	Fault F9-F9, F10-F10 and the limit of the area explored in the East (200 m from borehole MKG-1)
A8	Fault F1-f1, F7-F7, F10-F10, F11-F11 and upto the 150 m depth line
B1	Fault F7-F7, F9-F9, F10-F10 and more than 150 m depth line
B2	Fault F9-F9, F10-F10 and more than 150 m depth line

The seam-wise & sector-wise net Geological reserves are tabulated below :

Sector	Seam-wise Net Geological Reserves (Mt)							
	V	IVT	IVB	III T	IIIB	IIT	IIB	Total
I	2.192	0.998	2.844		1.894	1.907	1.777	11.612
II	1.790	1.090	2.776		2.185	1.709	2.049	11.599
III	0.036	0.130	0.404		0.413	0.300	0.439	1.722
IV	-	-	-		0.204	0.152	0.204	0.560
V	0.643	0.298	0.607		0.161	0.129	0.093	1.931
A5	2.47	1.69	3.10	0.23	1.39	1.24	1.16	11.280
A6	0.51	0.77	1.78	0.38	1.12	0.70	1.24	6.500
A7	2.845	1.088	2.491					6.424
A8	3.38	1.22	2.60	0.35	1.36	1.05	0.93	10.890
B1	3.146	1.317	2.102					6.565
B2	1.169	0.418	0.895					2.482
Total	18.181	9.019	19.599	0.96	8.727	7.187	7.892	71.565

Thus, the net in situ proved geological reserves in Gondagaon-Ghatrohan block are **71.565 million tonnes**.

2.7 MINE BOUNDARY, RESERVES, TARGET & MINE LIFE

2.7.1 MINE BOUNDARY DELINEATION

Mine Boundary of the Amalgamated Gondagaon Ghatrohan OC mine is as follows:

MINE BOUNDARY

Rise (North)	Dip (South)	East	West
On the floor of Seam-II (Bottom) at full thickness	At about 150 m depth or 140 m FRL on upthrow of fault F_1-F_1	60 m barrier from Inder Colliery in Gondagaon block and along Fault F_7-F_7 on Ghatrohan block.	100 m barrier from Kanhan river on the surface and Fault F_7-F_7 on Gondagaon block.

2.7.2 MINEABLE RESERVES

Out of total 71.565 Mt geological reserves of Gondagaon-Ghatrohan block, the geological reserves considered in Gondagaon-Ghatrohan OC mine upto 150m depth is 59.965 Mt. Rest 11.600 Mt lies in the dip side beyond 150m depth. Considering 10% geological losses due to geological disturbance e.g. Faults etc. and 5% mining losses due to losses during mining activity as per present practice, the mineable reserves upto 150m depth works out to **51.27 Mt**.

Out of 51.27 Mt reserves, **22.13 Mt** had already been extracted upto 31.03.2015 and therefore the balance reserve as on 01.04.2015 worked out to 29.14 Mt. However, in the updated RPR of Amalgamated Gondagaon Ghatrohan OC mine prepared in November, 2015, the balance mineable reserves had been re-calculated by MINEX Software based on the Working Plan (as on 31.03.2015) received from Mine (Plate-IIB) as **29.23 Mt** which

was considered in the updated RPR of Amalgamated Gondagaon Ghatrohan OC (Nov-2015).

To arrive at the balance coal and OB as on 01.04.2018 for the proposed updation of RPR of Amalgamated Gondagaon Ghatroha OC, actual coal and OB extracted from 01.04.2015 to January, 2017 and target coal and OB proposed for February and March, 2018 have been deducted from the total coal and OB (29.23 Mt coal and 121.31 Mm3 OB) of the approved RPR of November, 2015.

Calculations of projected balance reserves as on 31/03/2018 adopted for this report has been arrived at as shown in the following table :

Sl. No.	Description	Gondagaon By Deptt HEMM		Ghatrohan By HOE		Total	
		COAL	OB	COAL	OB	COAL	OB
		Mt	Mm3	Mt	Mm3	Mt	Mm3
1	Balance As Per RPR-2015	10.47	42.73	18.76	78.58	29.23	121.31
2	Actual 2015-16	2.13	4.30	0.00	0.00	2.13	4.30
3	Actual 2016-17	2.15	5.10	0.00	0.00	2.15	5.10
4	2017-18 (Actual 2017-18 upto Jan'18 & target for Feb & Mar '18)	2.26	6.74	0.50	6.97	2.76	13.71
5	Sub total=	6.54	16.14	0.50	6.97	7.04	23.11
6	Balance As On 31/03/18 = (1) - (5) =	3.93	26.59	18.26	71.61	22.19	98.20

In this mining plan total coal and OB considered as on 01.04.2018 are **22.19 Mt and 98.20 Mm3** respectively.

The entire quarry has been divided into four cuts namely; Cut (A+B) in Gondagaon OC quarry and Cut-C, D & E in Ghatrohan OC quarry. Thus Cut-wise balance reserves as on 01/04/2018 are as follows :

Cut No.	Description of Cut	Coal (Mt)	OB (Mm ³)	S.R. (m ³ /t)
A+B	Up to dip-side limit of Gondagaon quarry	3.93	26.59	6.77
C	Up to 210 FRL in Ghatrohan quarry	7.29	33.97	4.66
D	Up to up-thrown fault F1-F1' in Ghatrohan quarry	7.44	26.25	3.53
E	Up to dip-side limit in Ghatrohan quarry	3.53	11.39	3.23
	Total	22.19	98.20	4.43

2.8 TARGET PRODUCTION

Based on the Geo-mining parameters such as strike length, gradient, thickness of seam, average rate of deepening of opencast quarries in WCL and production performance in existing mine, the target production in the proposed Amalgamated Gondagaon Ghatrohan OC mine has been envisaged as **3.50 Mty**

2.9 MINE LIFE

The total mineable reserves in the proposed mine as on 1.4.2018 is 22.19 Mt and with a target production of 3.50 mty, the balance life of mine has been envisaged as **7 years** starting from 01.04.2018.

2.10 METHOD OF MINING

2.11 GEO-MINING CHARACTERISTICS

The geo-mining parameters of the Amalgamated Gondagaon Ghatrohan OC are detailed in the following table :

Sl. No.	Particulars	Gondagaon Quarry	Ghatrohan Quarry	Total
1.	Area of the Quarry (including existing OC)			
a)	On floor (ha)	95.43	87.35	182.78
b)	On surface (ha)	156.93	120.20	277.13

Sl. No.	Particulars	Gondegaon Quarry	Ghatrohan Quarry	Total
2.	Depth (m) (Balance Quarry)			
a)	Initial	120	37	
b)	Final	176	145	
3.	Average Gradient of Seam	1 in 3.5 to 1 in 5	1 in 3.8 to 1 in 5	
4.	Average thickness of seam (m)	27.43	28.34	27.72
5.	Average Strike length on floor of Quarry (m)	1600	1400	3000
6.	Width on surface (m) [dip rise]	860	1010	
7.	Width on floor (m) [dip rise]	620	750	
8.	GCV (0.10m dilution at each contact point) kCal/kg	4923	4775	4828
9.	Mineable Reserves (Mt)	3.93	18.26	22.19
10.	Total OB (Mm3)	26.59	71.61	98.20
11.	Average stripping ratio (m ³ /t)	6.77	3.92	4.43

2.12 SELECTION OF MINING METHOD

Gondegaon Ghatrohan OC is already in operation with Shovel Dumper system of mining and hence same technology has been envisaged in this updated RPR. Deployment of dragline is ruled out due to multi-seam working and varying thickness of partings between the coal seams. Due to steep gradient (1 in 3.5 to 1 in 5), Surface Miner deployment is also not feasible. Shovel-Dumper Technology is most flexible system and moreover, well adopted in coal mines of WCL. Considering the average gradient of mine inclined slicing method is envisaged in proposed mine.

2.13 EQUIPMENT SELECTION

In this Updated RPR, it is envisaged to excavate partially coal and OB by departmental HEMM keeping in view available capacity of Departmental HEMM as on 01.02.2018. Balance workload of coal & OB will be removed by hiring/outsourcing agency. The details of existing HEMM are as shown in the following table :

Sl. No.	Particulars	As per Updation RPR Feb-2018					
		Existing as on 01/02/2018		HEMM Requirement (Nos)			
		Year of Commissioning	Nos.	Year of Repl.	Repl.	Addl. Prov.	Total
	<u>FOR COAL & PARTING</u>						
1	6.1 m3(die) Hyd Shovel	2014	1	2021	1	0	1
2	5.0 m3(die) Hyd B/H	2009	1	2018	1	0	1
		2013	1	2020	1	0	1
3	4.3 m3(die) Hyd B/H	2013	2	2020	2	0	2
		2015	1	2022	1	0	1
		2018	1	2025	1	0	1
4	60 T RD DUMPERS	2008	3	2018	3	0	3
		2009	4	2018	4	0	4
		2011	2	2018	2	0	2
		2012	4	2019	4	0	4
		2013	5	2020	5	0	5
		2015	7	2022	7	0	7
		2016	4	2023	4	0	4
		2018	1	2025	1	0	1
5	460 HP DOZER	2001	1	2018	1	0	1
6	320 HP DOZER			No Repl.			
		2008	2		0	0	0
		2009	1	2018	1	0	1
		2010	2	2018	2	0	2
		2015	2	2022	2	0	2
		2018	1	2025	1	0	1
7	160mm RBH Drill(Diesel)	2001	1	2018	1	0	1
		2005	1	2018	1	0	1
		2014	1	2023	1	0	1
		2015	2	2024	2	0	2
		2017	1	2026	1	0	1
	<u>FOR COMMON</u>						
1	1.5 m3(die) Hyd B/H	2012	1	2019	1	0	1
2	294 HP Motor Grader	2012	1	2021	1	0	1
		2013	1	2022	1	0	1
3	Mobile Crane 30 t			No Repl		0	
		2001	1		0		0
		2016	1	2025	1	0	1

4	Mobile Crane 11 t	2017	1	2026	1	0	1

Sl. No.	Particulars	As per Updation RPR Feb-2018					
		Existing as on 01/02/2018		HEMM Requirement (Nos)			
		Year of Commissioning	Nos.	Year of Repl.	Repl.	Addl. Prov.	Total
5	Mobile Crane 9.5 t	2012	1	2021	1	0	1
6	Mobile Crane 8 t	2000	1	2018	1	0	1
7	Tyre Handler	2014	1	2021	1	0	1
8	Water sprinkler 28 kl	2015	1	2022	1	0	1
		2017	2	2024	2	0	2
9	5.74 m3 Front End Loader		0		0	1	1
10	Diesel Bowser 3kl		0		0	1	1
11	Mobile maintenance van		0		0	1	1
12	Fire fighting truck		0		0	1	1
NOTE:- 1. Year 2018 denotes the financial year 2018-19.							
2. For existing HEMM where replacement is overdue, it is considered in Year- 2018-19 .							
3. Replacement is considered as per requirement in mine.							

Based on the above departmental HEMM and year-wise lead and lift for coal and OB, the departmental HEMM capacity has been worked out in the range of **5.51 Mm³/year to 6.23 Mm³/year**. Accordingly, departmental workload has been deducted from annual quantities to arrive at annual balance workload for out-sourcing agency.

Due to presence of multi seams, entire coal extraction by departmental HEMM may create problem in proper sequencing of operation of departmental HEMM and out- sourcing HEMM. It would be better to separate the mining area of Departmental HEMM and hiring HEMM either horizontally and/ or vertically. After detailed discussions with project officials, it was decided that the entire departmental HEMM will be deployed in Gondagaon sub-quarry in initial 4 years (upto life of Gondagaon sub-quarry) and thereafter these HEMM will be deployed in Ghatrohan sub-quarry from 5th year to end of mine life (7th year). The balance quantities in Gondagaon and Ghatrohan sub-quarries will be handled by out-sourcing of HEMM. During deployment of departmental and

out-sourcing HEMM in same quarry, departmental HEMM shall be deployed at separate exclusive patch keeping safety barriers from the HOE patch.

2.14 MINING SYSTEM AND SYSTEM PARAMETERS

2.14.1 Width & Height of Benches

For overburden, keeping the bench height of 10 m, the width of working and non-working benches are kept as 30 m and 20 m respectively. Haul road would be constructed on the floor of the quarry at a gradient of 1 in 16 with a width sufficient for dumper movement, dozer path, drainage and electrification etc.

2.14.2 Slope of Benches & Quarry

i) During Mining Operation

The slope of individual benches depends on the type of strata. In this report, the slope of individual bench is proposed as 45° in soil, alluvium and clay whereas, it is 70° in hard strata. The overall slope of the quarry in dip side during mining operation varies around 22° (from horizontal plane) depending on the nature of strata in the entire depth of quarry.

ii) At the end of quarry

The slope of individual benches in the batter at the end of quarry remains same as that during mining operation i.e. 45° in soil, alluvium and clay and 70° in hard strata. Overall angle considered during planning is about 40° in dip side & about 37° in rise side. However, it is proposed to do scientific study for slope stability in quarry benches and OB dumps by any scientific agency.

2.15 MINING AND DUMPING STRATEGY

2.15.1 CONSTRAINTS ON MINE DEVELOPMENT

Following constraints are apprehended in mining :

Sl. No.	Constraint	Associated Risk
1	Gondegaon village Rehabilitation	Delay shall affect dumping schedule.
2	Land acquisition	Delay shall affect dumping schedule.

2.16 MINING STRATEGY

2.16.2 Presently, Amalgamated Gondegaon Ghatrohan OC is being worked in Partial Hiring option. The departmental HEMM has been deployed in Gondegaon sub-quarry whereas Ghatrohan sub-quarry is being worked through out-sourcing agency. In 2016-17, the total coal and OB extracted by departmental HEMM were 2.15 Mt and 4.35 Mm³ respectively.

It is proposed in this RPR to enhance the target capacity of Amalgamated Gondegaon Ghatrohan OC mine from 2.50 Mty to 3.50 Mty. Both Gondegaon and Ghatrohan sub-quarry will be worked simultaneously by deploying existing departmental HEMM as well as out-sourced HEMM. The capacity of departmental HEMM varies from 5.51 Mm³/year to 6.23 Mm³/year depending on the lead and lift of coal and OB. Initially, entire departmental HEMM will be deployed in Gondegaon sub-quarry and the entire coal and OB of this sub-quarry will be extracted in initial 4 year (2018-19 to 2021-22). In addition to departmental HEMM, part OB of Gondegaon sub-quarry will have to be excavated through out-sourcing agency.

The coal and OB from Ghatrohan sub-quarry will be worked by out-sourcing agency in initial 4 years and thereafter departmental HEMM from Gondegaon sub-quarry will be shifted to Ghatrohan sub-quarry in 5th year. The entire coal and OB of Ghatrohan sub-quarry will be worked in 7 years which is the total life of mine. The OB excavated from Gondegaon Sub-quarry will be partly accommodated in simultaneous internal dumping in Gondegaon sub-quarry and partly in external OB dumps. The OB from Ghatrohan sub-quarry will be initially dumped in External OB dump and internal dumping will start from 3rd year in decoaled void of Gondegaon sub-quarry as well as Ghatrohan sub-quarry.

2.16.3 VOLUME REGIME

The entire Gondegaon-Ghatrohan OC has been divided into four cuts namely; Cut (A+B) in Gondegaon sub-quarry and Cut-C, D & E in Ghatrohan sub-quarry. The mineable reserves, OB and stripping ratio in these cuts are given in the following table:-

Cut No.	Description of Cuts	Deptt./ Hiring	Coal (Mt)	OB (Mm ³)	S.R. (m ³ /t)
A+B	Up to dip-side limit of Gondegaon quarry	Deptt.	3.93	21.00	
		Hiring	0.00	5.59	
		Sub-Total	3.93	26.59	6.77
C	Up to 210 FRL in Ghatrohan quarry	Hiring	7.29	33.97	
		Deptt.	0.00	0.00	
		Sub-Total	7.29	33.97	4.66
D	Up to up-thrown fault F1-F1' in Ghatrohan quarry	Hiring	5.09	18.43	
		Deptt.	2.35	7.82	
		Sub-Total	7.44	26.25	3.53
E	Up to dip-side limit in Ghatrohan quarry	Hiring	1.43	4.22	2.95
		Dept.	2.10	7.17	3.41
		Sub-Total	3.53	11.39	3.23
Total		Deptt.	8.38	35.99	4.29
		Hiring	13.81	62.21	4.50
		Total	22.19	98.20	4.43

2.16.4 DUMPING STRATEGY

The total balance OB in Amalgamated Gondegaon Ghatrohan OC as on 01.04.2018 has been assessed as 98.20 Mm³, out of which 57.90 Mm³ OB is proposed to be dumped in External OB Dump - A3 & D4 (2.10 Mm³) and Dump - A2 (55.80 Mm³). The balance 40.30 Mm³ OB (98.20 Mm³ – 57.90 Mm³) will be accommodated in internal dumps in the decoaled void of Gondegaon sub-quarry and Ghatrohan sub-quarry.

Both Gondegaon and Ghatrohan sub-quarries will be worked simultaneously to achieve the target production of 3.50 Mty. The OB excavated from Gondegaon Sub-quarry will be partly accommodated in simultaneous internal dumping in Gondegaon sub-quarry and partly in external OB dumps. The OB from Ghatrohan sub-quarry will be initially dumped in External OB dump and internal dumping will start from 3rd year in decoaled void of Gondegaon sub-quarry as well as Ghatrohan sub-quarry.

2.16.5 Dump Capacity

The balance dump capacity of different existing OB Dumps in Amalgamated Gondegaon Ghatrohan OC has been assessed as on 01.04.2018 considering the quantity of OB already dumped as well as OB proposed to be dumped upto 31.03.2018. The details of OB Dumps with balance capacity as on 01.04.2018 are tabulated below :

DUMP CAPACITY

Sl. No.	Dump	Height	OB Dump Capacity (Mm ³) (As On 01.04.2018)
1	Top Soil Dump - A-3 & D-4	0 - 20m	2.10
2	External Dump A-2	0 - 30m	21.79
		30 – 60m	20.68
		60 – 90m	13.33
3	Internal Backfilling in decoaled void of Gondegaon and Ghatrohan sub-quarries	Below and Above Ground	40.30
	Grand Total		98.20

Thus, the percentage of internal dumping in proposed RPR of Amalgamated Gondegaon Ghatrohan OC works out to 41.04 %.

2.17 MINING SCHEDULE AND EQUIPMENT PHASING

2.17.1 DESIGN CRITERIA

The Revised Project Report of Amalgamated Gondegaon Ghatrohan OC mine has envisaged 330 days of working in a year based on 7 days schedule of mine working. As per the prevalent practice in WCL, there will be 3 working shifts in a day and each shift will be of 8 hours duration. The excavation category of OB material has been assumed as 50% Category– III + 50% Category-IV, whereas, for coal it is assumed as Category-IV. The in-situ volume weight of OB material has been considered as 2.1 t/m³ whereas for coal it is taken as 1.60 t/m³.

2.17.2 CALENDAR PROGRAMME OF EXCAVATION

Calendar Programme has been prepared on the basis of separate estimation of coal and overburden in various cuts of Gondegaon and Ghatrohan sub-quarries. Based on quarry-wise and cut-wise coal, OB and stripping ratio, year-wise natural OB has been assessed for planned production of coal. Thereafter, year-wise programmed OB has been planned to minimize the peak OB.

The Cut-wise coal, OB and stripping ratio is tabulated below : -

Cut-wise Coal, Natural OB (top OB & Parting) & Stripping Ratio

Quarry	CUT No.	Coal (Mt)	OB (Mm ³)			S.R. (m ³ /t)
			Top OB	Parting	Total	
Gondegaon	A+B	3.93		26.59	26.59	6.77
Ghatrohan	C	7.29	3.38	30.59	33.97	4.66
	D	7.44	2.63	23.63	26.25	3.53
	E	3.53	4.34	7.05	11.39	3.23
Total		22.19	10.35	87.85	98.20	4.43

The Calendar Programme in the proposed RPR of Amalgamated Gondegaon Ghatrohan OC has been prepared for target production of 3.50 Mty and the annual peak OB of 18.27 Mm³ in Partial Hiring Option. The balance coal

reserves and overburden have been estimated as on 01.4.2018 and the first year of the RPR has been considered as 2018-19. Calendar Programme has been drawn up separately for Gondagaon OC and Ghatrohan OC. The sequence of mining shall be as per the Balance of Cut-A+B in Gondagaon OC and Cuts-C, D, E of Ghatrohan OC.

The end limit floor contours of these cuts are shown in Quarry and Surface Layout Plan. It is imperative that this sequence of mining be strictly adhered to in order to obtain void for backfilling so that the dumping programme can be achieved. The basic mining strategy at Ghatrohan OC is to work the quarry in full strike keeping downthrown side advance up to the major up thrown strike Fault F_1-F_1 so that the void thus created can be subsequently utilized for backfilling while working at up throw side.

CALENDAR PROGRAMME

Yr	Quarry	Cut	Coal (Mt)		Natural O.B (Mm3)				Programmed O.B (Mm3)			
			Yearly	Cumm.	Top OB	Parting	Total	Cumm.	Top OB	Parting	Total	Cumm.
1	Gondagaon	BAL(A+B)	0.80	0.80	0.00	5.42	5.42	5.42	0.00	5.92	5.92	5.92
	Ghatrohan	CUT-C	2.20	2.20	1.69	8.56	10.25	10.25	1.69	9.06	10.75	10.75
	Sub-Total		3.00	3.00	1.69	13.98	15.67	15.67	1.69	14.98	16.67	16.67
2	Gondagaon	BAL(A+B)	0.90	1.70	0.00	6.09	6.09	11.51	0.00	6.09	6.09	12.01
	Ghatrohan	CUT-C	2.30	4.50	1.69	9.03	10.72	20.97	1.69	9.03	10.72	21.47
	Sub-Total		3.20	6.20	1.69	15.12	16.81	32.48	1.69	15.12	16.81	33.48
3	Gondagaon	BAL	1.15	2.85	0.00	7.78	7.78	19.29	0.00	7.78	7.78	19.79

Yr	Quarry	Cut	Coal (Mt)		Natural O.B (Mm3)				Programmed O.B (Mm3)			
			Yearly	Cumm.	Top OB	Parting	Total	Cumm.	Top OB	Parting	Total	Cumm.
		(A+B)										
	Ghatrohan	CUT-C/D	2.25	6.75	1.33	9.16	10.49	31.46	1.33	9.16	10.49	31.96
	Sub-Total		3.40	9.60	1.33	16.94	18.27	50.75	1.33	16.94	18.27	51.75
4	Gondegaon	BAL(A+B)	1.08	3.93	0.00	7.30	7.30	26.59	0.00	6.80	6.80	26.59
	Ghatrohan	CUT-D	2.42	9.17	3.47	5.68	9.15	40.61	3.47	5.68	9.15	41.11
	Sub-Total		3.40	13.10	3.47	12.98	16.45	67.20	3.47	12.48	15.95	67.70
5	Gondegaon		0.00	3.93	0.00	0.00	0.00	26.59	0.00	0.00	0.00	26.59
	Ghatrohan	CUT-D/E	3.50	12.67	2.17	10.18	12.35	52.96	2.17	10.18	12.35	53.46
	Sub-Total		3.50	16.60	2.17	10.18	12.35	79.55	2.17	10.18	12.35	53.46
6	Gondegaon		0.00	3.93	0.00	0.00	0.00	26.59	0.00	0.00	0.00	26.59
	Ghatrohan	CUT-E	3.50	16.17	0.00	11.90	11.90	64.86	0.00	11.90	11.90	65.36
	Sub-Total		3.50	20.10	0.00	11.90	11.90	91.45	0.00	11.90	11.90	91.95
7	Gondegaon		0.00	3.93	0.00	0.00	0.00	26.59	0.00	0.00	0.00	26.59
	Ghatrohan	CUT-E	2.09	18.26	0.00	6.75	6.75	71.61	0.00	6.25	6.25	71.61
	Sub-Total		2.09	22.19	0.00	6.75	6.75	98.20	0.00	6.25	6.25	98.20
TOTAL			22.09		10.35	87.85	98.20		10.35	87.85	98.20	

Last 5 years production is as given below:

Year	Coal Production
2018-19 (as on 20-01-2019)	2.47
2017-18	3.16
2016-17	2.15
2015-16	2.13
2014-15	1.86
2013-14	1.70
2012-13	1.82

The coal extraction and OB removal by departmental equipment as well as by hiring / out-sourcing of HEMM are given separately for both sub-quarries in the tables below :

Yr	Quarry	Programmed Coal & OB Departmental HEMM					Programmed Coal & OB Hiring of HEMM				
		Coal	Overburden				Coal	Overburden			
			Top Soil	Bal Top OB	Partg OB	Total OB		Top Soil	Bal Top OB	Partg OB	Total OB
1	Gondegaon	0.80	0.00	0.00	5.01	5.01	0.00	0.00	0.00	0.91	0.91
	Ghatrohan	0.00	0.00	0.00	0.00	0.00	2.20	0.75	0.94	9.06	10.75
	Sub-Total	0.80	0.00	0.00	5.01	5.01	2.20	0.75	0.94	9.97	11.66
2	Gondegaon	0.90	0.00	0.00	5.18	5.18	0.00	0.00	0.00	0.91	0.91
	Ghatrohan	0.00	0.00	0.00	0.00	0.00	2.30	0.37	1.32	9.03	10.72
	Sub-Total	0.90	0.00	0.00	5.18	5.18	2.30	0.37	1.32	9.94	11.63
3	Gondegaon	1.15	0.00	0.00	5.51	5.51	0.00	0.00	0.00	2.27	2.27
	Ghatrohan	0.00	0.00	0.00	0.00	0.00	2.25	0.18	1.15	9.16	10.49
	Sub-Total	1.15	0.00	0.00	5.51	5.51	2.25	0.18	1.15	11.43	12.76
4	Gondegaon	1.08	0.00	0.00	5.30	5.30	0.00	0.00	0.00	1.50	1.50
	Ghatrohan	0.00	0.00	0.00	0.00	0.00	2.42	0.40	3.07	5.68	9.15
	Sub-Total	1.08	0.00	0.00	5.30	5.30	2.42	0.40	3.07	7.18	10.65
5	Ghatrohan	1.48	0.00	0.00	4.98	4.98	2.02	0.40	1.77	5.20	7.37
6	Ghatrohan	1.49	0.00	0.00	5.01	5.01	2.01	0.00	0.00	6.89	6.89
7	Ghatrohan	1.49	0.00	0.00	5.01	5.01	0.60	0.00	0.00	1.24	1.24
TOTAL		8.39	0.00	0.00	36.00	36.00	13.80	2.10	8.25	51.85	62.20

2.18 DUMPING SCHEDULE

The total balance OB in Expansion of Gondegaon Extension OC (Amalgamated Gondegaon Ghatrohan OC) as on 01.04.2018 has been assessed as 98.20 Mm³, out of which 57.90 Mm³ OB is proposed to be dumped in External OB Dump - A3 & D4 (2.10 Mm³) and Dump - A2 (55.80 Mm³). The balance 40.30 Mm³ OB (98.20 Mm³ – 57.90 Mm³) will be accommodated in internal dumps in the decoaled void of Gondegaon sub-quarry and Ghatrohan sub-quarry.

The year-wise and quarry-wise OB quantity and the dumping schedule is tabulated below :

DUMPING SCHEDULE

Yr	Quarry	Total OB	Top OB			Parting OB	Dumping Programme				
			Top Soil	Bal Top OB	Total Top OB		Top Soil Dump A-3,D-4 0-20m	External Dump A-2			Internal Back- filling
								0-30m	30-60 m	60-90 m	
1	Gondegaon	5.92				5.92		5.92			
	Ghatrohan	10.75	0.75	0.94	1.69	9.06	0.75	0.94	9.06		
	Sub-Total	16.67	0.75	0.94	1.69	14.98	0.75	6.86	9.06		
2	Gondegaon	6.09				6.09		4.87			1.22
	Ghatrohan	10.72	0.37	1.32	1.69	9.03	0.37	1.32	9.03		
	Sub-Total	16.81	0.37	1.32	1.69	15.12	0.37	6.19	9.03		1.22
3	Gondegaon	7.78				7.78		5.37			2.41
	Ghatrohan	10.49	0.18	1.15	1.33	9.16	0.18	1.00	2.59	2.37	4.35
	Sub-Total	18.27	0.18	1.15	1.33	16.94	0.18	6.37	2.59	2.37	6.76
4	Gondegaon	6.80				6.80		2.37			4.43
	Ghatrohan	9.15	0.40	3.07	3.47	5.68	0.40			5.60	3.15
	Sub-Total	15.95	0.40	3.07	3.47	12.48	0.40	2.37		5.60	7.58
5	Ghatrohan	12.35	0.40	1.77	2.17	10.18	0.40			3.25	8.70
6	Ghatrohan	11.90				11.90				1.85	10.05
7	Ghatrohan	6.25				6.25				0.26	5.99
TOTAL		98.20	2.10	8.25	10.35	87.85	2.10	21.79	20.68	13.33	40.30

2.19 ANNUAL PRODUCTIVITY OF HEMM & LEAD

2.19.1 ANNUAL PRODUCTIVITY OF HEMM AND WORKLOAD FOR DEPARTMENTAL AND HIRING HEMM

Calculations of Annual Departmental Capacities are as shown in the following tables considering availability of 30 nos 60T Dumpers & Shovels / Backhoes as per HEMM list supplied by Mine/Area.

Sl. No.	Particulars	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7
1.	Lead	3.00	3.00	2.75	3.00	2.75	2.50	2.50
2	Total Departmental Capacity (Coal +Parting)	5.51	5.74	6.23	5.98	5.90	5.94	5.94

Annual Departmental quantities been deducted from total annual quantities in the Calendar Programme to arrive at annual balance workload for hiring/ Out-sourcing agency.

2.19.2 WORKLOAD FOR HIRING AGENCY WITH LEAD FOR COAL & OB

The year-wise workload for hiring/ out-sourcing agency with lead for coal and OB (separately for Top Soil, Top OB excluding Top Soil and Parting OB) in proposed RPR of Amalgamated Gondegaon Ghatrohan OC are tabulated below :

Year-wise Workload and Lead For Hiring / Out-sourcing Agency

Yr	Quarry	Coal		Top Soil		Bal Top OB		Parting OB	
		Qty	Lead	Qty	Lead	Qty	Lead	Qty	Lead
		Mt	km	Mm ³	Km	Mm ³	Km	Mm ³	Km
1	Gondegaon							0.91	3.00
	Ghatrohan	2.20	2.25	0.75	2.50	0.94	2.50	9.06	3.00
	Sub-Total	2.20		0.75		0.94		9.97	
2	Gondegaon							0.91	2.75
	Ghatrohan	2.30	2.25	0.37	2.50	1.32	2.75	9.03	3.00
	Sub-Total	2.30		0.37		1.32		9.94	

Yr	Quarry	Coal		Top Soil		Bal Top OB		Parting OB	
		Qty	Lead	Qty	Lead	Qty	Lead	Qty	Lead
		Mt	km	Mm ³	Km	Mm ³	Km	Mm ³	Km
3	Gondegaon							2.27	2.25
	Ghatrohan	2.25	2.00	0.18	2.50	1.15	2.50	9.16	2.50
	Sub-Total	2.25		0.18		1.15		11.43	
4	Gondegaon							1.50	2.50
	Ghatrohan	2.42	2.00	0.40	2.50	3.07	3.25	5.68	2.50
	Sub-Total	2.42		0.40		3.07		7.18	
5	Ghatrohan	2.02	2.00	0.40	2.50	1.77	3.25	5.20	2.75
6	Ghatrohan	2.01	2.00					6.89	2.50
7	Ghatrohan	0.60	3.00					1.24	2.50
TOTAL		13.80		2.10		8.25		51.85	

2.20 EQUIPMENT SCHEDULE

2.20.1 EXISTING, REPLACEMENT AND ADDITIONAL HEMM

List of existing HEMM as on 01/02/2018 have been made available by mine and is enclosed as Ann-IV. As per the date of commissioning & CIL Survey-Off Norms (approved in CMD's meet dated 10.7.2007), availability of the said equipment has been assessed. The break-up of existing HEMM, Replacement HEMM & additional HEMM considered in this updated PR is as follows :

EXISTING, REPLACEMENT AND ADDITIONAL HEMM

Sl. No.	Particulars	As per Updation RPR Feb-2018					
		Existg as on 01/02/2018		HEMM Requirement (Nos)			
		Yr of Comm	Nos	Yr of Repl.	Repl.	Addl. Prov.	Total
	<u>FOR COAL & PARTING</u>						
1	6.1 m3(die) Hyd Shovel	2014	1	2021	1	0	1
2	5.0 m3(die) Hyd B/H	2009	1	2018	1	0	1
		2013	1	2020	1	0	1
3	4.3 m3(die) Hyd B/H	2013	2	2020	2	0	2
		2015	1	2022	1	0	1
		2018	1	2025	1	0	1
4	60 T RD DUMPERS	2008	3	2018	3	0	3
		2009	4	2018	4	0	4
		2011	2	2018	2	0	2
		2012	4	2019	4	0	4
		2013	5	2020	5	0	5
		2015	7	2022	7	0	7
		2016	4	2023	4	0	4
		2018	1	2025	1	0	1
5	460 HP DOZER	2001	1	2018	1	0	1
6	320 HP DOZER			No Repl.			
		2008	2		0	0	0
		2009	1	2018	1	0	1
		2010	2	2018	2	0	2
		2015	2	2022	2	0	2
		2018	1	2025	1	0	1
7	160mm RBH Drill(Diesel)	2001	1	2018	1	0	1
		2005	1	2018	1	0	1
		2014	1	2023	1	0	1
		2015	2	2024	2	0	2
		2017	1	2026	1	0	1

Sl. No.	Particulars	As per Updation RPR Feb-2018					
		Existg as on 01/02/2018		HEMM Requirement (Nos)			
		Yr of Comm	Nos	Yr of Repl.	Repl.	Addl. Prov.	Total
	<u>FOR COMMON</u>						
1	1.5 m3(die) Hyd B/H	2012	1	2019	1	0	1
2	294 HP Motor Grader	2012	1	2021	1	0	1
		2013	1	2022	1	0	1

3	Mobile Crane 30 t	2001	1	No Repl.	0	0	0
		2016	1	2025	1	0	1
4	Mobile Crane 11 t	2017	1	2026	1	0	1
5	Mobile Crane 9.5 t	2012	1	2021	1	0	1
6	Mobile Crane 8 t	2000	1	2018	1	0	1
7	Tyre Handler	2014	1	2021	1	0	1
8	Water sprinkler 28 kl	2015	1	2022	1	0	1
		2017	2	2024	2	0	2
9	5.74 m3 Front End Loader		0		0	1	1
10	Diesel Bowser 3kl		0		0	1	1
11	Mobile maintenance van		0		0	1	1
12	Fire fighting truck		0		0	1	1
NOTE:- 1. Year 2018 denotes the financial year 2018-19.							
2. For existing HEMM where replacement is overdue ,it is considered in Yr-2018 ie 2018-19 .							
3. Replacement is considered as per need.							

DRILLING & BLASTING

The degree of fragmentation in opencast mine has to be optimised so that total cost of drilling, blasting, excavating, transport and crushing as a total system is minimised. In OB, powder factor of 1.70 m³/kg has been considered. Powder factor of 7 t/kg has been considered in coal. It is recommended that blasting parameters shall be optimised from time to time depending upon local site conditions at the time of actual operations.

2.21 COAL QUALITY

Coal quality has been calculated considering GCV of boreholes within the quarry separately for Gondegaon & Ghatrohan quarry & thereafter the weighted GCV is calculated on the basis of reserves of both the quarries.

Details of the calculations are as shown in the following table :-

Seam-wise Quality of Coal

COAL QUALITY WITH 10 CM DILUTION AT EACH CONTACT POINT										
Seams	Gondegaon OC					Ghatrohan OC				
	Effective thickness (m)	Weighted GCV (kCal/kg)		Sub Qrry Reserves (Mt)	Weighted GCV Combined Seams	Effective thickness (m)	Weighted GCV (kCal/kg)		Sub Qrry Reserves (Mt)	Weighted GCV Combined Seams
		Without dillution	With 10cm dillution				Without dillution	With 10cm dillution		
V	8.02	4305	4200		4200	7.21	4528	4406		4406
IV-TOP	3.37	4567	4311		4540	3.10	4314	4053		4406
IV BOTTOM	6.77	4894	4754			5.09	4902	4716		
III-TOP	1.58	5033	4467		4989			4467		5364
III BOTTOM	3.43	5761	5444			3.07	5713	5364		
II-TOP	2.36	5598	5160		5150	1.85	5598	5051		5179
II BOTTOM	2.28	5592	5141			2.63	5707	5304		
	27.80			3.93		22.95			18.26	
Quarry-wise Weighted GCV with Dilution =					4923					4775
Weighted Average GCV of Entire Gondegaon Ghatrohan OC (With Dilution)					4801					

The weighted average GCV of coal for entire Gondegaon Ghatrohan OC considering dilution of 0.10m at each contact point has been assessed as **4801 kCal/kg (Grade – G-9)**.

2.22 PROVISION OF PUMPS, PIPES AND PIPE FITTINGS

Pumping system has been designed for the volume of water accumulated in the mine at the target plus five year production considering maximum rainfall in a day as **190mm**.

Peak pumping capacity worked out as **327389 m³**. Above volume of water will be dewatered in **5** days at the rate of **20** hrs pumping per day. Pumping capacity per day thus worked out as **65478 m³**.

2.23 SELECTION OF PUMPS, PIPES & FITTINGS

Upon considering the existing pumps against the provisions of approved RPR, balance requirement for pumps, pipes and fittings has been worked out. Accordingly provision has been made in this updated RPR for 7 Nos of 160 lps, 220 m head pumps and 6 Nos of 80 lps, 60 m head pumps along with

necessary pipes and fittings. Balance capital provision of Rs 705.26 Lakhs has been provided.

2.24 COAL HANDLING ARRANGEMENT

Presently there are two streams (CHP – I & CHP –II) in existing Gondagaon Ghatrohan OC mine, wherein coal is crushed by feeder breakers and discharged on to 1200 mm wide conveyors and thereafter to a fixed grizzly which in turn discharges coal on to 60t capacity overhead hoppers. In the last approved RPR (2.50 Mty), there was provision of one additional mobile crusher proposed to be operated departmentally. This mobile crusher has not been procured till date and therefore capital for the same has been retained in this RPR. Extra manpower has been provided for this departmental mobile crusher.

Since the target capacity of the mine has been increased in this updated RPR from 2.50 Mty to 3.50 Mty, one (1 no.) additional mobile crusher on hiring basis has been considered in this RPR to cater the additional 1.0 Mty crushing requirement. The crushing charge of Rs. 23.50/t on hiring basis for 1.0 Mty coal has been considered in this report. One number of 100te electronic weigh bridge has also been provided for handling extra work load. Capital Provision of Rs 718.28 Lakhs has been provided.

2.25 WORKSHOP

HEMM deployed by hiring of equipment shall be maintained by contractor. For Departmental equipment, an independent full fledge unit excavation workshop has been envisaged for the project. Proposed workshop will consist of two types of maintenance and repair shops. These maintenance and repair shops will be as follows :

2.25.1 Excavation Workshop

This workshop would extend basic engineering support in respect of maintenance and repair of various departmental HEMM Deployed in the mine.

Capital repair of HEMM and other equipment would be carried out at central workshop, Tadali.

2.25.2 E & M Workshop

Separate E & M workshop facilities have also been provided to carry out maintenance and repair of the CHP, equipment , pumps, Light Vehicles, electricals etc.,

Capital Provision of Rs. 331.20 lakhs for both Excavation and E & M workshop has provided

2.26 POWER SUPPLY

2.26.1 SOURCE OF POWER

Gondegaon OC project is at present receiving power at 33 kV by means of an overhead feeder from Khaparkera substation of MSEDCL. An alternate 33 kV feeder has also been drawn to the project substation from Mansar substation of MSEDCL, which act as a stanby feeder in case of failure of Khaparkhera feeder. The projected maximum demand for the amalgamated Gondegaon-Ghatrohan OC mine (including residential colony) for partial hiring option is 5962 kVA.

No additional quarters have been proposed for partial hiring option in the updated RPR. Power to township shall continue to be drawn from the project main substation. At present project main substation is having two 33 kV / 3.3 kV main transformers having capacity of 2.5 MVA each. In view of the increase in projected maximum demand, it is proposed to install an additional 33 kV /3.3 kV transformer of capacity 5 MVA. This enhanced capacity of substation will cater the load of pumping and CHP of proposed mine

The Salient features of the Electrical Parameters in proposed updated RPR of Amalgamated Gondegaon Ghatrohan OC mine are detailed below :

2.26.2 SALIENT FEATURES OF THE ELECTRICAL PARAMETERS

SI. No.	Item Head	Partial Hiring Option
1	Projected Maximum Demand	
	A) Only Mine	5412 kVA
	B) Only Township	550 kVA
	C) Total	5962 kVA
2	Specific Energy Consumption	
	A) With Respect To OB Production	nil
	B) With Respect To Coal Production	0.86 kWh/t
	C) With Respect To Common Load	3.41 kWh/t
	D) With Respect To Total Load	4.28 kWh/t
3	Specific Power Cost	40.08 Rs./t
4	Fixed Percentage Of Power Cost	61.43 %
5	Variable Percentage Of Power Cost	38.57 %
6	Average Cost Of Purchased Power	9.37 Rs./kWh

Additional capital provision of Rs 5.9465 crores for Electrical P&M has been provisioned.

2.27 CIVIL CONSTRUCTION

The estimated life of Amalgamated GondEGAON Ghatrohan OC is 7 years as on 01.04.2018 and there is scope of future expansion in dip side, as such all civil works have been envisaged on permanent specifications. It should be ensured that all the service & residential buildings are constructed on non-coal bearing area. The topsoil in this region is predominantly black cotton. Hence provision in the estimate has been made for poor/black cotton soil, safeguarding against the settlement of foundations. Hence, provision for soil investigations has also been made in the estimates. Therefore, it is suggested that before undertaking detailed engineering and construction work, geo-engineering investigations of soil should be done.

The Building Cost Index works out to 592 in 2018 (1st half) for Areas falling in Maharashtra State considering the prevalent rates of materials and labours in the Areas, with reference to 100 base at Nagpur as on 1.1.1992.

2.27.1 SERVICE BUILDINGS

Keeping in view the needs and requirements of this mine, provision for service buildings such as office & stores, first aid centre and other buildings have been provided. As per requirement of project authorities, provision for Managers Office, renovation of excavation office & Sub-area Manager Office, Hard Stand for dumpers etc. have been provided.

2.27.2 RESIDENTIAL BUILDING

Total manpower proposed for this project is 921. However, considering the availability of 340 nos. of existing houses in the neighborhood, no provision for Residential buildings has been envisaged except for 1.80 km boundary wall for existing colony.

2.27.3 ROADS AND CULVERTS

Colony Roads and Culverts

As there is no new colony, hence no colony roads are provided.

Haul Roads & Culverts

In Partial Hiring Option, transportation of part of total OB is proposed to be done by Hiring of HEMM & provision of 4.00 km haul road has been kept as per 60T Dumper specification.

Service Roads & Culverts

For approaching different Service Buildings, 0.50 km additional road is needed & provisions have been made accordingly.

Diversion and Strengthening of Road

Diversion of 2.50 km of existing village cart roads have been envisaged in this RPR and accordingly provision has been made.

Further provision of 2.50 km of surface road has been kept in order to take care of diversions in the existing surface roads because of re-alignment of surface dumps.

As per requirement of project authorities, further provision for Public Road fly-over for dumper crossing have been provided near Ghatrohan village and accordingly provision has been made.

2.27.4 WATER SUPPLY AND SEWERAGE

No additional residential quarters have been provided in this RPR and therefore there is no provision for colony water supply and sewerage. For the proposed mine workings and service buildings, industrial water supply and sewerage arrangement have been envisaged.

2.28 SAFETY & CONSERVATION

The project report has been drawn in conformity with the prevailing statutory provisions applicable for safety in Opencast Mines. However following matters related to safety during opencast operations have to be given special considerations.

2.28.1 PRECAUTIONS AGAINST SURFACE WATER

Ghatrohan Sub-quarry is at 100 m distance from Kanhan river and a part of quarry falls below HFL. The HFL of Gondegaon & Ghatrohan Opencast block is 279.035 m recorded on 7th Sept.1994 by Inder Colliery Survey Office. Since there is a danger of flood water from Kanhan river to proposed quarry, a flood protection embankment has been proposed. The proposed embankment is 30m wide at the top and of height 6m above HFL. As per prevailing practice, proposed embankment has to be constructed by spreading the suitable soil i.e fine grained soil for Hearting zone and coarse grained soil for casing zone in continuous layers and compacted by mechanical means i.e. by rollers to standard optimum dry density at optimum moisture content. Also it has been proposed to provide 300 mm thick boulders pitching on water side of embankment upto HFL. However for portion of embankment where the surface level is higher than the HFL, no pitching has been envisaged.

However before adoption of this section it is suggested that the proposed embankment section may be got approved by competent authority like Maharashtra Irrigation department of Govt. of Maharashtra and DGMS for its structural safety and stability. The alignment of the proposed embankment is shown in Quarry Layout Plan. It is also suggested to determine withdrawal level/Danger mark, so that as water level crosses the limit, workings shall be stopped.

Suitable alarms connected to float in Kanhan river would be provided at strategic places like Time Keeper Office, Security Office, Safety Office, Manager Residence, Pit Office etc. The floats in the river would activate the alarms as soon as the water level in the river crosses the danger mark. Suitable action can then be taken to investigate the alarm and take other suitable precautions. In addition, river side patrolling would also be carried out during monsoon to caution the project authority in case of any sudden rise in the river. Adequate wireless communication sets have been provided for the above purpose. The rain water falling within the project area would be diverted from the quarry area by providing garland drains and shall be collected towards low lying area.

2.28.2 FIRE & SPONTANEOUS HEATING

Wild or herbaceous plants shall be removed from the mine. No person shall deposit heated material or ashes on any opencast working. Also no person shall light a fire or permit a fire to be lighted in any OC working except by the permission in writing of the Manager and only for a special purpose specified

therein. No coal shall be left exposed in coal benches more than its incubation period to avoid fire in seam due to spontaneous heating. Proper type of the extinguisher to be kept in each HEMM ready for use in case of emergency. One Fire Fighting Truck has been provided in this report. In coal stock, coal shall be despatched on the basis of first in first out.

2.28.3 SLOPE STABILITY

It is suggested that following action may be taken to deal with slope stability problem.

- i) Vulnerable area may be identified and marked on quarry plan.
- ii) Observation of actual alignment of fault, its throw, joints, etc. may be recorded during the process of exploitation.
- iii) Water drainage system may be properly implemented to prevent accumulation of water in cracks. Also dumps shall be leveled to prevent accumulation of water over it. Proper drainage in dumps shall be also provided to prevent erosion of toe of dump. A provision of Rs 50.00 lacs have been kept for dump monitoring equipment so as to effectively monitor dumps on a regular basis.
- iv) Regular monitoring of tension cracks, horizontal and vertical movement of strata in critical area may be done.
- v) Rise side slope to be reinforced if required because it has to stand throughout quarry life. No dumps/surface structures to be located within 15m of quarry edge as it will act as surcharge there by destabilizing the slope.
- vi) No undercutting of slopes to be done.
- vii) Proper hydrogeological studies to be done if water table is at level of slope it should be brought down by using submersible pumps to prevent hydrostatic pressure.
- viii) Proper selection of site for dumping to be done and place shall be made free from loose material. Dumping shall not be done at an angle more than angle of repose of material being dumped.
- ix) After completion of dumping operations, dumps to be stabilized by growing vegetation.
- x) Every person deployed by leaser of HEMM must be trained & briefed about aspects related to slope stability.

2.28.4 HAUL ROAD MAINTENANCE

Adequate care must be taken for proper construction and maintenance of haul road as per the existing guidelines. The gradient of haul road should not be steeper than 1 in 16.

2.28.5 BLASTING OPERATIONS

As explosives are required in bulk for blasting in OC mines, provision of regulation should be ensured. All blasting operations shall be carried out in day light. Suitable precautions shall be taken as per statute before and after blasting operations. Controlled blasting technique has to be practised to minimise fly off rocks and ground vibrations and keep them within safe limits. In order to keep the ground vibrations within the permissible limit, to avoid flying of rock fragments and also to achieve satisfactory blasting results, optimized drilling / blasting parameters depending upon rock formation using combination of relays / delays will have to be evolved. It is further recommended that at the time of actual execution, proper study for controlled blasting and ground vibration is done with scientific body in order to evolve site specific charge distance relationship.

2.28.6 SCIENTIFIC STUDIES

Following areas have been identified in the proposed mine for detailed scientific studies:

a) Slope Stability

It is proposed to carry out scientific study on slope stability of external and internal OB dumps as well as for final slope of quarry batter. Based on the findings of scientific research the proposed slope of dumps and batter in the report may change.

b) Drilling & Blasting

For optimum fragmentation of rock and coal to minimize the overall cost of excavation, it is proposed in this report to engage some scientific body to carry out research for optimum drilling and blasting. Accordingly, the powder factor suggested after this study will be followed in the proposed mine.

c) Hydrogeology

Proper provision has been made in this report for scientific study to assess the hydrogeological parameters of the proposed area.

In addition to this, various other parameters like, soil testing, etc. need scientific study. A capital provision of Rs. 30.00 Lakhs has been kept for the above scientific studies.

2.28.7 SAFETY ASPECTS FOR OUTSOURCING/HIRING OF HEMM

Special precaution should be taken while deploying workers in the mine. Before employing any labour to the mine, proper vocational training should be imparted and recommendations of Safety Conference should be strictly followed. Terms and conditions shall be fixed by management for deployment of labours by leaser of HEMM as well as machineries. Some of the major aspects are as follows:

A) For persons :

- i) No persons shall be deployed unless he is trained at VTC
- ii) Records in Form-B & Form-D shall be maintained.
- iii) Records of Vocational Training Certificate and driving licence of operators shall be kept by HEMM outsourcing agency and shall be made readily available for inspection by management.
- iv) Salaries shall be distributed in front of management representative.
- v) No person shall be employed unless person holds VTC certificate and Management is informed. A record of it shall be maintained.
- vi) Adequate supervision shall be maintained by qualified competent persons.

B) For Machineries :

- i) All the machineries to be deployed in mines should be checked before deployment. Regular checking of m/c deployed by leaser of

HEMM shall be done. No unfit m/c shall be deployed before the defect is rectified.

- ii) A proper record of repair and maintenance alongwith inspection done by management and defect pointed out shall be maintained and signed by authorised person.
- iii) The trucks deployed by leaser of HEMM shall be provided with Audio visual alarms, proper light for use at night and period when natural light is not sufficient. Also audio visual alarms for reversing on trucks shall be provided.

Other precautions for machines

- i) RTO certificate photo copies of all vehicles shall be submitted to management.
- ii) Daily welding, monitoring, inspection shall be done by the HEMM outsourcing agencies mechanic as directed by management.
- iii) Machine manufacturers should be asked to give risk analysis.
- iv) Suitable type of the fire extinguishers shall be provided in every machines.

C) General :

- i) No person/vehicle shall be deployed at any place other than authorised place.
- ii) All workers should obey lawful instruction of mine management.
- iii) Risk Management Plan of tipper/pay loader shall be made and implemented.
- iv) All drivers shall obey systematic traffic rules prepared by management.

- v) Before deploying workers they must be trained and briefed about safety aspects in opencast mine. .

2.29 COMPENSATION & REHABILITATION

Payment of compensation for land losers has been estimated as per data submitted by Mine Area as per "The Right to Fair Compensation & Transparency in Land Acquisition, Rehabilitation & Resettlement Act, 2013". One time monetary compensation in lieu of employment has been proposed as communicated by Mine/Area. This report envisages rehabilitation of Gondegaon village. The provisions kept are estimates only based on present data and are subject to change at the time of actual implementation.

2.30 MINE CLOSURE PLANNING

2.30.1 Mine closure planning has to be carried out at the starting of the mine and needs periodic reviewing and revision during its life cycle to cope with the geo-technical constraints, safety and economic risks, social & environmental challenges. For the Mine Closure activities, a corpus fund is created by opening an escrow account with the coal controller organization in nationalised bank. For opencast mine, an amount @ Rs 6.00 lakhs per Ha of the project area and for underground mine, an amount @ Rs 1.00 lakhs per Ha of the project area is required to be deposited in this account for final mine closure. Progressive mine closure is done with the fund provided in approved report. The above rate has been adopted as per Circular No. 55011-01-2009-CPAM, GOI, Ministry of Coal, dated 27 August 2009.

2.30.2 EXISTING MINE CLOSURE CORPUS

The existing Mine Closure Cost was assessed for 12 years life and ML area of 845.74 ha with a mine target of 2.50 Mty. The total mine closure fund for Amalgamated Gondegaon Ghatrohan OC deposited in the Escrow A/c till date is as follows :

Year	Mine Closure Amount Deposited in Escrow A/c
2013-14	Rs 14.8284 crs
2014-15	Rs 5.9528 crs
2015-16	Rs 2.5502 crs
2016-17	Rs 4.3733 crs
2017-18	Rs 5.0458 crs
Total	Rs 32.7506 crs

2.30.3 REVISED MINE CLOSURE CORPUS AS PER APPROVED MINING PLAN FOR 3.50 MTY

The Mining Plan for Expansion Gondegaon Extension Opencast Coal Mine project (Amalgamated Gondegaon Ghatrohan OC mine) was approved by WCL for 3.50 Mty capacity. Accordingly, the Revised Mine Corpus for Gondegaon Extension Opencast Coal Mine Expansion project (Amalgamated Gondegaon Ghatrohan OC mine) was prepared by WCL in October, 2017 for enhance target capacity of 3.50 Mty and life of 10 years (balance life of 8 years as on 01.04.2017). The calculation of above Mine Closure Cost is tabulated below :

Sl. No.	Details	Qty
1	WPI for All Commodities for Aug 2009 (Old Series)	129.6
2	WPI for All Commodities for Sept, 2017 (Provisional) (New Series)	114.3
3	WPI for All Commodities for Sept, 2017 (Provisional) (Converted to Old series, conversion factor = 1.561)	178.4223
4	Ratio of WPI = (3) / (1)	1.3767153
5	Total land area requirement for the project excluding 21.66 ha land required for rehabilitation Colony (ha) =	824.08
6	Mine closure cost @ Rs 6 lacs/ha (Rs in Lakhs) =	4944.48
7	Mine closure cost after indexing from August, 2009 to September, 2017 (Rs. In Lakhs) = (6) x (4) =	6807.14
8	Total Mine Closure Amount deposited in Escrow A/c	2770.47

	upto 2016-17 (Rs. In Lakhs)	
9	Total Mine Closure Corpus after adjusting the amount deposited in Escrow A/c (Rs. In Lakhs) = (7) – (8) =	4036.67
10	Balance Life of the mine as on 01.04.2017 (Total Life of 10 years – 2 years completed (2015-16 & 2016-17)	8
11.	Annual Contribution to Escrow fund for 2017-18 (Rs in Lakhs) = (9) / (10) =	504.58

2.30.4 MINE CLOSURE CORPUS AS PER PRESENT MINING PLAN

The total Mine Lease area in the approved Mining Plan and above Mine Closure Plan was 845.74 ha and mine life was 8 years as on 01.04.2017. This Revised Project Report has been prepared for the same Mine Lease Area of 845.74 ha and same mine life (balance life of 7 years as on 01.04.2018). Hence, the Mine Closure Plan detailed above in Para. 18.2 approved by WCL based on the approved Mining Plan for 3.50 Mty will remain valid for this updated RPR of Amalgamated Gondegaon Ghatrohan OC mine.

The year-wise Mine Closure Cost with 5% escalation in subsequent years is tabulated below :

YEAR-WISE MINE CLOSURE COST

Year			Annual Production (Mty)	Corpus Fund (Rs. in Lakhs)	Mine Clos ure Cost (Rs /t)
From opening Year of Escrow A/c	Opening Year of proposed RPR (Feb, 2018)	Calendar Year			
A) Closure Cost already deposited / to be deposited upto 2017-18					
1		2013-14	1.820	1482.84	81.48
2		2014-15	1.860	595.28	32.00
3		2015-16	2.130	255.02	11.97
4		2016-17	2.150	437.33	20.34
5		2017-18	2.76	504.58	18.28

Sub-Total (A)			10.72	3275.05	
B) Closure Cost To Be Deposited as Per RPR (Feb, 2018) for 3.50 Mty					
6	1	2018-19	3.00	529.81	17.66
7	2	2019-20	3.20	556.30	17.38
8	3	2020-21	3.40	584.12	17.18
9	4	2021-22	3.50	613.32	17.52
10	5	2022-23	3.50	643.99	18.40
11	6	2023-24	3.50	676.19	19.32
12	7	2024-25	2.09	710.00	33.97
Sub- Total (Year-6 to 12) (Year 1 to 7 of RPR, Feb, 2018)			22.19	4313.75	19.44
Total			32.91	7588.80	23.06

In this RPR, the mine closure cost of Rs. 19.44/t has been considered in the estimate of unit cost of production.

2.30.5 BREAK-UP OF CLOSURE FUND FOR VARIOUS CLOSURE ACTIVITIES

The activity wise break-up of mine closure corpus fund is tabulated below :

Activity wise Break-up of Closure Cost

Sl. No.	Activity	% of Total Mine Closure Cost	Amount (Rs in Lakhs)	Remarks
A	Dismantling of structures			To be included in final mine closure plan.
	Service Building	0.2	15.18	
	Residential Building	2.67	202.62	
	Industrial Structures like, Workshop, Field substation, etc.	0.3	22.77	
B	Permanent Fencing of mine void and other dangerous area			To be included in final mine closure plan.
	Random rubble masonry of height 1.2 meter including leveling up in cement concrete 1:6:12 in mud mortar	1.5	113.83	
C	Grading of highwall slopes			To be included in final mine closure plan.
	Levelling and grading of highwall slopes	1.77	134.23	
D	OB Dump Reclamation			

Sl. No.	Activity	% of Total Mine Closure Cost	Amount (Rs in Lakhs)	Remarks
	Handling/Dozing of OB Dump into mine void and preparation of Internal dump for reclamation.	88.66	6728.29	71% for progressive and 17.66% for final mine closure.
	Technical and Bio-reclamation including plantation and post care.	0.4	30.36	Equal Weightage through-out the life of the mine.
E	Landscaping			
	Landscaping of the open space in leasehold area for improving its aesthetic and eco value.	0.3	22.77	Equal Weightage through-out the life of the mine.
F	Plantation			
	Plantation over cleared area obtained after dismantling.	0.5	37.95	To be included in final mine closure plan.
	Plantation around the quarry area and in safety zone.	0.2	15.18	Equal Weightage through-out the life of the mine.
	Plantation over the external OB Dump	0.02	1.52	Equal Weightage through-out the life of the mine.
G	Post Closure Env Monitoring/Testing of Parameters for three years.			For three years after mine closure
	Air Quality	0.22	16.70	
	Water Quality	0.2	15.18	
H	Entrepreneurship development (vocational/ skill development) Training for sustainable income of affected people.	0.26	19.73	Equal Weightage through-out the life of the mine.
I	Miscellaneous and other mitigative measures.	2	151.78	Equal Weightage through-out the life of the mine.
J	Post Closure Man power cost for supervision	0.8	60.71	To be included in final mine closure plan.
TOTAL		100%	7588.80	

1. Mining is to be carried out in a phased manner initiating afforestation / reclamation work in the mined out area of first phase while commencing mining in the 2nd phase.
2. Upto 80% of the total deposited amount including interest accrued in the ECSROW account may be released after every 5 years. The amount released should be equal to expenditure incurred on Progressive Mine closure in past 5 years or 80% whichever is less.
3. The above cost / expenditure will be met from the corpus fund deposited in the escrow account by the mine operator. However, the additional amount beyond the escrow account will be provided by the mine operator after estimating the final mine closure cost (as per the mine closure guideline).
4. The amount indicated separately under each head in the above table is indicative only and based on actual expenditure the amount may change.

CHAPTER – III: DESCRIPTION OF ENVIRONMENT

3.1 INTRODUCTION

Presently Expansion of Gondagaon Extension OC is an on-going project of Western Coalfield Limited located in Nagpur, Maharashtra. This mine is adjacent to Inder UG to OC and Kamptee Deep OC mines. The detailed location of the project area is shown in Plate-I. Regular environmental monitoring is being carried out as per statute.

The baseline data for Air, Water and Noise quality for the project has been generated from **October, 2018 till January, 2019**. Baseline report on Flora-Fauna and Socio-economic data of adjacent mine i.e. Kamptee Deep OC has been considered.

The monitoring of ambient air, water and noise for existing Expansion of Gondagaon Extension OC is also being carried out on fortnightly basis by CMPDI.

3.2 ENVIRONMENTAL QUALITY

3.2.1 Regional Climate

The region enjoys a very dry and semi humid climate throughout the year excepting monsoon season (June to September). Climate here witnesses a very hot weather during the months of summer. It reaches the pinnacle in the month of May.

Blowing dry wind makes the climate scorching almost throughout the summer. The maximum temperature remains more than 42° C. At times, it may reach to 48° C. Monsoon advances in the month of June (Normal date of onset of monsoon over Nagpur is 10th June). Maximum rainfall occurs during July and August months. Winter season here is spine chilling. Minimum temperatures hover around 12° C. and at times even dip below that level.

3.2.2 Micro-Meteorological Scenario

The wind velocity ranged between <0.3 m/s to 4.2 m/s. The seasonal average wind speed was observed to be 1.7 m/s. The analysis of wind pattern during the season showed that the predominant wind directions were from East North East, North North East followed by North East having frequencies 7.09%, 6.98% & 6.80% respectively. The maximum temperature recorded was 38.9°C and the minimum was 8.4°C. The daily average relative humidity values were in the range of 40.0 to 73.0%. The sky was mostly

clear during the study period. The average atmospheric pressure value has been found to be around 977.4hPa. Light rain was recorded during the study period.

Methodology

As a part of this study, micrometeorology and microclimatic parameters were recorded by installing a meteorological station at Gondegaon Transit Hotel. Data of wind velocity, wind direction, ambient temperature, relative humidity and cloud cover were recorded at hourly intervals in a day throughout the study period. Further rainfall also has been recorded and reported.

Wind velocity and wind direction were recorded using cup anemometer and wind vane respectively. Ambient temperature was noted by wet and dry bulb thermometer. Relative humidity was measured from hygrometer and a self-recording rain gauge was used for rainfall data collection. Cloud cover data has been collected by visual inspection.

Data Collection and Analysis

The Micro- Meteorological data thus collected has been processed and analyzed as per standard procedures. The seasonal wind distribution is given in the table below. The meteorology status is also furnished in tabular form.

Project: Expn. Gondegaon Extn. OC Mine **Period:** 22nd Oct.'2018 – 11th Jan.'2019

Table 1 - Seasonal wind distribution data

Wind Direction	Wind Velocity (Kmph) & Duration (%)				
	< 1	1 - 5	6 - 11	>11	Total
N		1.58	3.08	0.13	4.79
NNE		2.77	4.19	0.03	6.98
NE		2.22	4.35	0.23	6.80
ENE		2.64	4.22	0.23	7.09
E		2.43	3.85	0.13	6.41
ESE		1.11	0.70	0.00	1.81
SE		0.18	0.39	0.00	0.57
SSE		0.31	0.34	0.00	0.65
S		0.21	0.49	0.00	0.70
SSW		0.18	0.57	0.03	0.78
SW		0.03	0.16	0.00	0.18
WSW		0.03	0.13	0.00	0.16
W		0.44	0.44	0.06	0.93
WNW		0.08	0.10	0.00	0.18
NW		0.65	0.34	0.00	0.98
NNW		0.72	0.72	0.08	1.53
CALM	59.54	-	-	-	59.54
Total	59.54	49.48	4.23	0.00	100.00

Description of Environment

CMPDI

ABSTRACT OF MICROMETEOROLOGICAL DATA

Project: **EXP. GONDEGAON EXT. OC**Season: **Winter**Month: **October 2018**

Date	Wind Velocity (km/h)							Predomina nt Wind Direction (From)	Temperature (°K)			Relative Humidity (%) Average	Rainf all (mm)
	Min.	Max.	Avg.	% Duration					Min.	Max.	Avg.		
				< 1	1-4	5-7	> 7						
22.10.18	< 1	15	3.5	52.17	4.35	32.61	10.87	W	295	308	301.6	51.2	0
23.10.18	< 1	7	1.39	78.26	2.17	19.5	00.00	NE	294	306	299.4	53.3	0
24.10.18	< 1	6	1.28	74.47	12.77	12.77	00.00	E	293	306	299	59.8	0
25.10.18	< 1	11	0.74	88.04	3.26	6.52	2.17	N	292	307	299.1	56	0
26.10.18	< 1	11	0.80	88.89	2.22	4.44	4.44	N	292	307	299.5	54.4	0
27.10.18	< 1	6	0.46	91.49	2.16	6.38	00.00	WNW	293	307	299	55	0
28.10.18	< 1	6	0.96	77.08	20.83	2.08	00.00	ENE	292	304	298.5	54.6	0
29.10.18	< 1	11	4.46	41.30	2.17	34.78	21.74	NE	292	303	297.4	52	0
30.10.18	< 1	15	4.04	54.17	4.17	16.67	25.00	NE	293	303	297.6	56.4	0
31.10.18	< 1	15	4.76	37.78	22.22	20.00	20.00	NE	292	304	298.6	64.3	0

Project: **EXP. GONDEGAON EXT. OC**Season: **Winter**Month: **November 2018**

Date	Wind Velocity (m/s)							Predomina nt Wind Direction (From)	Temperature (°K)			Relative Humidity (%) Average	Rainf all (mm)
	Min.	Max.	Avg.	% Duration					Min.	Max.	Avg.		
				< 1	1-4	5-7	> 7						
01.11.18	< 1	9	2.1	66.67	2.22	28.89	2.22	NE	295	304	299.2	67.2	0
02.11.18	< 1	11	3.35	46.67	11.11	31.11	11.11	ENE	294	305	299.4	66.2	0
03.11.18	< 1	9	2.02	64.58	12.50	20.83	2.08	ENE	293	306	299.6	66.1	0
04.11.18	< 1	7	0.76	86.96	4.35	8.70	00.00	S	294	306	299.6	66.5	0
05.11.18	< 1	11	2.51	60.0	11.11	22.22	6.67	SSW	296	305	300	67.2	0
06.11.18	< 1	7	2.51	51.16	23.26	25.58	00.00	N	295	306	300.6	65.1	0
07.11.18	< 1	7	2.45	53.19	23.40	23.40	00.00	NE	295	304	298.5	54	0
08.11.18	< 1	7	1.52	70.21	17.02	12.77	00.00	ENE	289	305	296.9	56.5	0
09.11.18	< 1	6	1.02	76.60	19.15	4.26	00.00	NNE	290	305	296.8	54.7	0
10.11.18	< 1	7	1.84	62.50	25	12.50	00.00	NNE	289	304	297	48.3	0
11.11.18	< 1	7	1.66	68.09	14.89	17.02	00.00	NNE	288	304	296.1	49.1	0
12.11.18	< 1	7	3.27	38.10	26.19	35.17	00.00	NW	273	304	294.5	47.6	0
13.11.18	< 1	6	1	79.17	12.50	8.33	00.00	ENE	288	305	296	47.8	0
14.11.18	< 1	11	1.66	68.89	20.00	6.67	4.44	NE	288	306	296.5	49.5	0

Description of Environment

CMPDI

15.11.18	< 1	6	1.3	77.08	4.17	18.75	00.00	10.42	290	306	297	68	0
16.11.18	< 1	6	0.7	87.23	4.26	8.51	0.00	ENE	290	306	297.2	51.4	0
17.11.18	< 1	9	0.96	85.11	2.13	10.64	2.13	NE	290	306	297.3	55	0
18.11.18	< 1	6	1.78	63.04	21.74	15.22	00.00	NE	290	305	297.5	59.8	0
19.11.18	< 1	6	1.12	75.00	18.75	6.25	00.00	S	292	306	298.4	58.1	0
20.11.18	< 1	6	0.91	80.85	10.64	8.51	00.00	E	293	305	298.8	60.7	0
21.11.18	< 1	9	2.95	54.17	2.08	39.58	4.17	ENE	291	305	298	59.6	0
22.11.18	< 1	6	2.29	54.17	22.92	22.92	00.00	NE	291	304	296.8	54.3	0
23.11.18	< 1	7	1.6	67.39	19.57	13.04	00.00	NNW	289	304	296.5	54.5	0
24.11.18	< 1	7	2.06	63.83	10.64	25.53	00.00	NNE	291	304	296.5	52.3	0
25.11.18	< 1	6	0.82	82.61	10.87	6.52	00.00	ENE	288	303	295.4	53.2	0
26.11.18	< 1	6	0.72	84.09	11.36	4.55	00.00	NW	288	303	295	52.4	0
27.11.18	< 1	6	0.5	91.11	2.22	6.67	00.00	NE	288	303	294.6	51.5	0
28.11.18	< 1	9	1.78	71.74	4.35	21.74	2.17	E	287	302	294.4	55.2	0
29.11.18	< 1	9	1.35	74.42	13.95	9.30	2.33	ENE	288	302	294.3	60	0
30.11.18	< 1	4	1.30	67.44	32.56	00.00	00.00	NE	288	302	294.5	61.7	0

Project: EXPN. GONDEGAON EXTN. OC

Season:

Winter

Month:

December 2018

Date	Wind Velocity (m/s)							Predomina nt Wind Direction (From)	Temperature (°K)			Relative Humidity (%) Average	Rainfal l (mm)
	Min.	Max.	Avg.	% Duration					Min.	Max.	Avg.		
				< 1	1-4	5-7	> 7						
01.12.18	< 1	11	1.064	85.11	2.13	8.52	4.26	ENE	288	302	294.5	61.9	0
02.12.18	< 1	6	1.39	73.91	8.7	17.39	00.00	NNE	288	301	294	63.2	0
03.12.18	< 1	7	1.27	71.11	24.44	4.44	00.00	ENE	288	301	294.5	61	0
04.12.18	< 1	9	2.45	57.45	14.89	21.28	6.38	NE	288	301	294.7	61	0
05.12.18	< 1	6	0.6	87.23	8.51	4.26	00.00	E	291	300	295	62.8	0
06.12.18	< 1	6	0.58	87.5	8.33	4.17	00.00	NNW	288	301	294.3	67.6	0
07.12.18	< 1	9	3.61	34.04	21.28	42.56	2.13	NNE	290	301	295.4	63.8	0
08.12.18	< 1	7	2.39	56.52	15.22	28.26	00.00	ENE	291	301	295.5	61.5	0
09.12.18	< 1	15	3.74	39.13	23.91	28.26	8.69	E	292	299	295.1	79.2	0
10.12.18	< 1	9	2.85	44.68	27.66	25.53	2.13	E	292	300	295.6	88.6	0
11.12.18	< 1	7	3.19	36.17	34.04	29.79	00.00	N	292	300	295.5	76.5	0
12.12.18	< 1	7	2.17	54.35	30.43	15.22	00.00	NNE	287	301	293.8	65	0
13.12.18	< 1	9	3.42	43.75	16.67	29.17	10.42	E	288	301	294.5	63	0
14.12.18	< 1	15	5.72	21.28	17.02	34.04	27.66	N	289	300	294.6	63	0

Description of Environment

CMPDI

Date	Wind Velocity (m/s)							Predomina nt Wind Direction (From)	Temperature (°K)			Relative Humidity (%) Average	Rainfal l (mm)
	Min.	Max.	Avg.	% Duration					Min.	Max.	Avg.		
				< 1	1-4	5-7	> 7						
15.12.18	< 1	13	5.98	10.42	20.83	50.00	18.75	NNE	289	299	293.5	60.5	0
16.12.18	< 1	15	6.56	2.08	25.00	52.08	20.83	NNE	288	298	293	52.7	0
17.12.18	< 1	15	8.65	6.25	8.33	31.25	54.17	NE	290	295	292.	64	0
18.12.18	< 1	13	4.67	27.08	22.92	35.41	14.58	NNE	273	296	291	76	0
19.12.18	< 1	6	1.35	71.74	17.39	10.87	00.00	E	285	298	291	74	0
20.12.18	< 1	7	1.62	66.67	20.00	13.33	00.00	NE	284	298	291	66.4	0
21.12.18	< 1	9	2.42	62.50	12.50	12.50	12.50	ENE	284	299	291	55.8	0
22.12.18	< 1	9	2.17	58.33	20.83	18.75	2.08	ENE	283	299	291	50.3	0
23.12.18	< 1	9	0.79	82.98	14.89	00.00	2.13	E	284	299	291	51.7	0
24.12.18	< 1	6	1.28	74.47	12.77	12.77	00.00	ENE	293	306	299	59.7	0
25.12.18	< 1	7	3.13	42.55	17.02	40.43	00.00	ENE	286	300	293	53.3	0
26.12.18	< 1	9	3.35	43.75	16.67	33.33	6.25	SSW	287	302	294.2	56.5	0
27.12.18	< 1	15	6.9	14.58	4.17	25.00	31.25	N	288	298	293.5	49.2	0
28.12.18	< 1	15	4.58	47.92	6.25	18.75	27.08	N	283	297	290	40.1	0
29.12.18	< 1	13	3.10	55.32	4.26	31.91	8.51	NE	279	296	287.7	46.5	0
30.12.18	< 1	9	2.04	59.57	25.53	12.77	2.13	E	281	297	289	42.2	0
31.12.18	< 1	7	2.34	53.66	24.39	21.92	00.00	NNW	282	299	289.2	38.6	0

Project: **EXP.N. GONDEGAON EXT.N. OC**

Season:

Winter

Month:

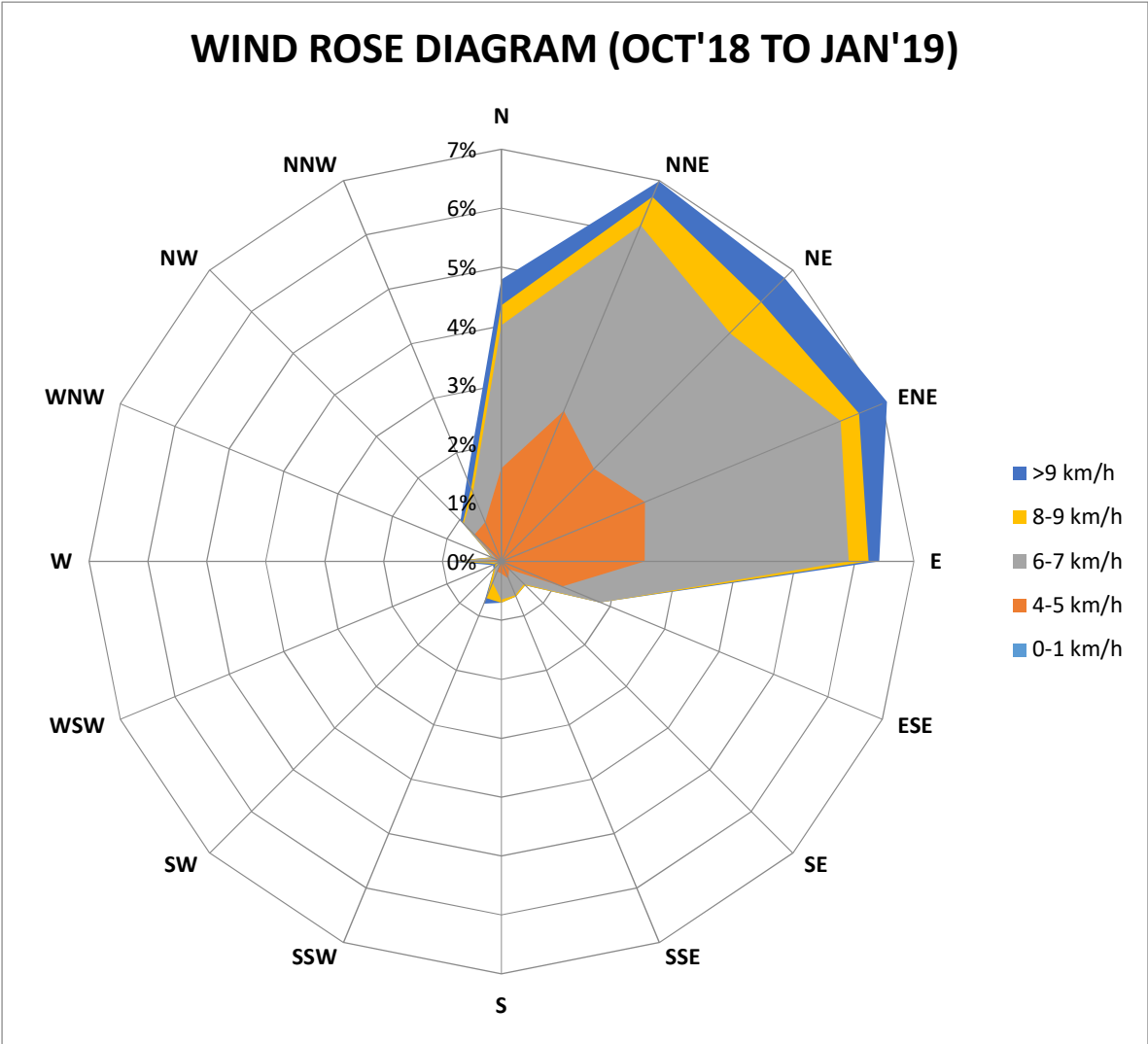
January 2019

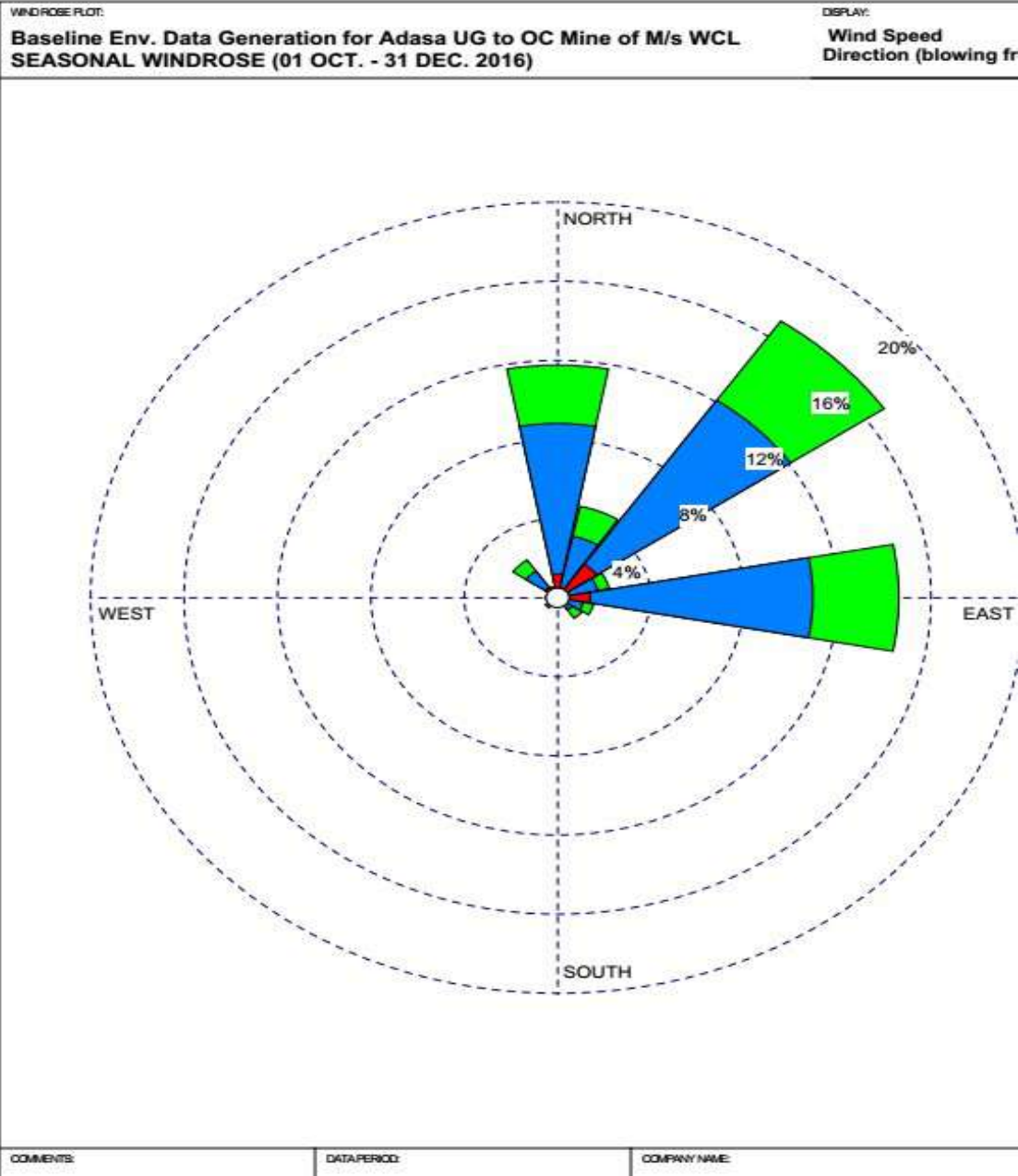
Date	Wind Velocity (m/s)							Predomina nt Wind Direction (From)	Temperature (°K)			Relative Humidity (%) Average	Rainf all (mm)
	Min.	Max.	Avg.	% Duration									
				< 1	1-4	5-7	> 7						
01.01.19	< 1	7	3.2	34.78	36.96	28.26	00.00	ESE	283	301	292	37	0
02.01.19	< 1	7	1.18	81.25	00.00	18.75	00.00	ESE	283	303	292	44.1	0
03.01.19	< 1	7	1.7	64.58	22.92	12.50	00.00	E	285	302	293	49	0
04.01.19	< 1	6	2.51	43.18	43.18	13.64	00.00	ENE	285	301	292.6	50.7	0
05.01.19	< 1	7	3	40.00	28.89	31.11	00.00	E	285	301	293	55.8	0
06.01.19	< 1	15	3.16	56.25	10.42	16.67	16.67	SSW	286	301	293.6	62	0
07.01.19	< 1	11	4.78	23.40	27.66	31.91	17.02	N	290	300	293.8	52.5	0
08.01.19	< 1	9	3.6	34.04	27.66	36.17	2.13	N	284	298	290.8	50.5	0
09.01.19	< 1	7	2.8	47.92	25.00	27.08	00.00	N	284	299	291.1	53.4	0

Description of Environment

CMPDI

Date	Wind Velocity (m/s)							Predomina nt Wind Direction (From)	Temperature (°K)			Relative Humidity (%) Average	Rainf all (mm)
	Min.	Max.	Avg.	% Duration					Min.	Max.	Avg.		
				< 1	1-4	5-7	> 7						
10.01.19	< 1	11	3.35	43.75	20.83	27.08	8.33	NNE	284	300	291.6	54	0
11.01.19	<1	9	2.12	59.57	23.40	6.38	4.26	SE	285	301	292.3	55.4	0





3.3 AMBIENT AIR QUALITY SCENARIO

The monitoring stations were identified on the basis of meteorology in the upwind and downwind direction as well as to represent the cross sectional scenario of the project site. The monitoring network was designed based on the available meteorological and climatologically norms of predominant wind direction and wind speed of the study region.

The parameters selected for analyzing the air quality status are Particulate Matter <10 & 2.5, Sulphur dioxide (SO₂), Nitrogen oxides (NO_x) and Heavy Metals. As per the existing norms, air quality monitoring was carried out on 24 hourly basis for two days in a week for twelve weeks in the season. The location details of ambient air quality monitoring stations are given in the Table below:

Table 2 - Details of Ambient air quality monitoring stations

Sl. No.	Location Name/Location Code	Direction & distance w.r.t Project Site	Height of Sampling Point (m)	Description
01.	Juni Kamptee Village (downwind) (SA1)	SW, 1.7 Km	3.0	Residential Area
02.	Gondegaon Transit Hostel (SA2)	-	3.0	Core Zone
03.	Warada Village (upwind) (SA3)	NE, 1.5 Km	3.0	Residential Area
04.	Bid bina Village (downwind) (SA4)	SW, 1.0 Km	3.0	Residential Area
05.	Waregaon Village (SA5)	SW, 2.5 Km	3.0	Residential Area
06.	Khairi Village (SA6)	SW, 5.5 Km	3.0	Residential Area

3.3.1 Data presentation & analysis

The ambient air quality data collected and the abstract of the same is given in the Tables below.

Period: 22nd Oct. 2018 to 11th Jan. 2019

Parameters	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Juni Kamptee Village				
No. of observations	24	24	24	24
Minimum Concentration	63	27	7	15
Maximum Concentration	75	43	14	25
Average	69	35	11	20
98 th percentile	75	42	14	25
Gondegaon Transit Hostel				
No. of observations	24	24	24	24
Minimum Concentration	53	21	7	14
Maximum Concentration	68	42	13	23

Parameters	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Average	62	29	9	18
98 th percentile	68	39	13	23
Warada Village				
No. of observations	24	24	24	24
Minimum Concentration	54	23	7	15
Maximum Concentration	73	43	14	24
Average	65	33	10	19
98 th percentile	72	43	14	24
Bina Village				
No. of observations	24	24	24	24
Minimum Concentration	57	28	7	15
Maximum Concentration	75	38	15	24
Average	66	33	10	20
98 th percentile	73	38	14	24
Waregaon Village				
No. of observations	24	24	24	24
Minimum Concentration	64	27	8	13
Maximum Concentration	78	47	15	26
Average	72	36	11	21
98 th percentile	78	44	14	26
Khairi Village				
No. of observations	24	24	24	24
Minimum Concentration	52	22	8	15
Maximum Concentration	68	35	12	24
Average	62	28	10	19
98 th percentile	67	34	12	23
NAAQS STD.(24 hrs ug/m3)	100	60	80	80

Gaseous Pollutants & Heavy Metals :

Juni Kamptee				
Parameters	Nov'18	Dec'18	Jan'19	Stds.
Ozone (O ₃) *	16.8	20.3	21.7	180 µg/m ³
Lead (Pb)	0.03	0.04	0.04	1.0 µg/m ³
Carbon Monoxide (as CO)	0.2	0.24	0.26	4.0 mg/m ³
Ammonia (as NH ₃) *	10.7	11.2	10.6	400 µg/m ³
Benzene (as C ₆ H ₆)	3.26	3.24	3.27	5.0 µg/m ³
Benzo [a] Pyrene (as BaP)- particulate phase only	<1.0	<1.0	<1.0	1.0 ng/m ³
Arsenic (as As)	2.51	2.55	2.61	6.0 ng/m ³
Nickel (as Ni)	7.81	8.51	8.5	20.0 ng/m ³

Transit Hostel				
Parameters	Nov'18	Dec'18	Jan'19	Stds.
Ozone (O ₃) *	17.1	16.3	15.7	180 µg/m ³
Lead (Pb)	0.04	0.03	0.04	1.0 µg/m ³
Carbon Monoxide (as CO)	0.22	0.2	0.21	4.0 mg/m ³
Ammonia (as NH ₃) *	8.12	8.79	8.85	400 µg/m ³
Benzene (as C ₆ H ₆)	3.46	3.22	3.26	5.0 µg/m ³
Benzo [a] Pyrene (as BaP)- particulate phase only	<1.0	<1.0	<1.0	1.0 ng/m ³
Arsenic (as As)	2.84	2.45	2.44	6.0 ng/m ³
Nickel (as Ni)	8.54	8.19	7.56	20.0 ng/m ³

Warada Village				
Parameters	Nov'18	Dec'18	Jan'19	Stds.
Ozone (O ₃) *	17.8	18.2	18.7	180 µg/m ³
Lead (Pb)	0.04	0.04	0.05	1.0 µg/m ³
Carbon Monoxide (as CO)	0.23	0.25	0.23	4.0 mg/m ³
Ammonia (as NH ₃) *	8.12	8.1	0.08	400 µg/m ³
Benzene (as C ₆ H ₆)	3.46	3.36	3.29	5.0 µg/m ³
Benzo [a] Pyrene (as BaP)- particulate phase only	<1.0	<1.0	<1.0	1.0 ng/m ³
Arsenic (as As)	2.8	2.46	2.29	6.0 ng/m ³
Nickel (as Ni)	8.41	8	7.9	20.0 ng/m ³

Bidbina Village				
Parameters	Nov'18	Dec'18	Jan'19	Stds.
Ozone (O ₃) *	13.3	17.4	19.3	180 µg/m ³
Lead (Pb)	0.02	0.05	0.06	1.0 µg/m ³
Carbon Monoxide (as CO)	0.18	0.21	0.26	4.0 mg/m ³
Ammonia (as NH ₃) *	7.71	10.5	9.7	400 µg/m ³
Benzene (as C ₆ H ₆)	<3.20	<3.20	3.26	5.0 µg/m ³
Benzo [a] Pyrene (as BaP)- particulate phase only	<1.0	<1.0	<1.0	1.0 ng/m ³
Arsenic (as As)	<2.50	<2.50	2.56	6.0 ng/m ³
Nickel (as Ni)	6.59	7.37	8.14	20.0 ng/m ³

Waregaon Village				
Parameters	Nov'18	Dec'18	Jan'19	Stds.
Ozone (O ₃) *	14.1	15	17.3	180 µg/m ³
Lead (Pb)	0.02	0.02	0.04	1.0 µg/m ³
Carbon Monoxide (as CO)	0.2	0.19	0.22	4.0 mg/m ³
Ammonia (as NH ₃) *	8.53	8.46	8.79	400 µg/m ³
Benzene (as C ₆ H ₆)	<3.20	<3.20	3.26	5.0 µg/m ³
Benzo [a] Pyrene (as BaP)- particulate phase only	<1.0	<1.0	<1.0	1.0 ng/m ³
Arsenic (as As)	<2.50	<2.50	2.51	6.0 ng/m ³
Nickel (as Ni)	7.21	7.48	8.17	20.0 ng/m ³

Kahiri Village				
Parameters	Nov'18	Dec'18	Jan'19	Stds.
Ozone (O ₃) *	15.2	16.3	16.7	180 µg/m ³
Lead (Pb)	0.03	0.03	0.05	1.0 µg/m ³
Carbon Monoxide (as CO)	0.24	0.2	0.23	4.0 mg/m ³
Ammonia (as NH ₃) *	8.76	9.5	9.76	400 µg/m ³
Benzene (as C ₆ H ₆)	<3.20	<3.20	<3.20	5.0 µg/m ³
Benzo [a] Pyrene (as BaP)- particulate phase only	<1.0	<1.0	<1.0	1.0 ng/m ³
Arsenic (as As)	<2.50	<2.50	<2.50	6.0 ng/m ³
Nickel (as Ni)	7.92	7.25	7.82	20.0 ng/m ³

3.3.2 Observation and Summary

PM₁₀ and PM_{2.5} values are ranging from 52 µg/m³ to 75 µg/m³ and 228 µg/m³ to 47 µg/m³ respectively. SO₂ and NO_x values are varying between 7 to 15 µg/m³ and 13 to 26 µg/m³ respectively. The heavy metals values are found to be very low and negligible. The heavy metals like Arsenic (As) and Mercury (Hg) were found to be Below Detectable Limit (BDL) and other metals like Nickel (Ni), Lead (Pb) and Chromium (Cr) values are found to be very low and negligible. All the values are found to be well within the NAAQ Standards prescribed by CPCB.

In general, all the values are found to be well within the AAQM Standards prescribed by CPCB.

3.4 WATER QUALITY SCENARIO

Any adverse impact or pollution consequence of water will have serious effect on the environment. Hence, it becomes important to assess the water quality periodically in the mining area. Thus, to assess the water quality, Six locations are identified and samples (6 Nos.) were collected and analyzed for physico-chemical and heavy metal parameters. Bacterial examination was also carried out to find out the Coliform contamination (if any) at water sources. The water quality assessment has been made from the following monitoring stations.

Table 3 - Sampling Locations for water quality

Sl. No.	Name of Sampling Locations	Frequency	Location Code	
01.	Junikamptee - Hand Pump	Once in a season	GW ₁	Ground Water
02.	Ghatrohana - Hand Pump	Once in a season	GW ₂	
03.	Pench River (Up/S)	Once in a season	SW ₁	Surface Water
04.	Pench River (Dn/S)	Once in a season	SW ₂	
05.	Mine water discharge	Once in a season	WW	Industrial Effluent/Mine Water
06.	Mine water discharge	Once in a season	MW	

3.4.1 Data presentation & analysis

The detailed water quality data generated is given in tables below:-

(Wherever not specified, characteristics are expressed in mg/l, maximum)

Table 4 - Test characteristics for drinking water

Sl. No	Parameters	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
		BINA VILLAGE FIELD,	GONDEGAON	Desirable limit	PLV in the absence of alternate source
1	Colour Hz)	1	2	5	15
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	1	1	1	5
4	pH Value	7.90	8.28	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	188	152	200	600
6	Iron -mg/l	<0.06	<0.06	0.3	No relaxation
7	Chlorides - mg/l	44	32	250	1000
8	Residual Chlorine -mg/l (min.)	<0.02	<0.02	0.2	1
9	Fluoride- mg/l	0.28	0.27	1.0	1.5
10	TDS -mg/l	282	254	500	2000
11	Calcium -mg/l	60.8	59.2	75	200
12	Magnesium - mg/l*	9	26	30	100
13	Copper -mg/l	<0.03	<0.03	0.05	1.5
14	Manganese - mg/l	<0.02	<0.02	0.1	0.3
15	Sulphate -mg/l	27	20	200	400
16	Nitrates - mg/l	13	17	45	No relaxation
17	Cadmium - mg/l	<0.0005	<0.0005	0.003	No relaxation
18	Lead -mg/l	<0.005	<0.005	0.01	No relaxation

Sl. No	Parameters	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
		BINA VILLAGE FIELD,	GONDEGAON	Desirable limit	PLV in the absence of alternate source
19	Selenium –mg/l*	<0.005	<0.005	0.01	No relaxation
20	Total Arsenic - mg/l*	<0.005	<0.005	0.01	0.05
21	Zinc -mg/l	<0.01	<0.01	5	15
22	Total Chromium - mg/l	<0.01	<0.01	0.05	No relaxation
23	Boron -mg/l	<0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	160	148	200	600
25	Nickel-mg/l	<0.02	<0.02	0.02	No relaxation
26	Aluminum -mg/l*	<0.03	<0.03	0.1	0.2

Table 5 - Physico-chemical characteristics of ground water samples

Sr. No.	Test Parameters	Unit	Acceptable/ Permissible Limit	GW. Ghatrohana	GW. Juni Kamptee
1	Colour*	Hazen Units	5/15	1.0	1.0
2	Odour*	--	Agreeable	Agreeable	Agreeable
3	pH value*	--	6.5 to 8.5	7.70	7.97
4	Taste	--	Agreeable	Agreeable	Agreeable
5	Temperature	°C	--	23	24
6	Turbidity*	NTU	1/5	1.05	0.74
7	Total Dissolved Solids*	mg/l	500/2000	339.0	375.0
8	Aluminium (as Al)	mg/l	0.03/0.2	<0.01	<0.01
9	Anionic Detergent (as MBAS)	mg/l	0.2/1.0	<0.1	<0.1
10	Boron (as B)	mg/l	0.5/1.0	<0.06	<0.06
11	Calcium (as Ca)*	mg/l	75/200	52.8	48.0
12	Chloride (as Cl)*	mg/l	250/1000	9.99	29.9
13	Copper (as Cu)	mg/l	0.05/1.5	<0.01	<0.01
14	Fluoride (as F)*	mg/l	1.0/1.5	0.322	0.34

Sr. No.	Test Parameters	Unit	Acceptable/ Permissible Limit	GW. Ghatrohana	GW. Juni Kamptee
15	Free Residual Chlorine	mg/l	0.2/1.0	<0.1	<0.1
16	Iron (as Fe) *	mg/l	1.0	0.096	0.95
17	Manganese (as Mn)	mg/l	0.1/0.13	<0.02	<0.02
18	Nitrate (as NO ₃)*	mg/l	45	2.74	7.41
19	Phenolic Compounds	mg/l	0.001/0.002	<0.001	<0.001
20	Selenium (as Se)	mg/l	0.01	<0.01	<0.01
21	Sulphate (as SO ₄)*	mg/l	200/400	5.56	16.7
22	Total Alkalinity (as	mg/l	200/600	200.0	170.0
23	Total Hardness(as	mg/l	200/600	208.0	248.0
24	Cyanide (as CN)	mg/l	0.05	<0.05	<0.05
25	Zinc (as Zn)	mg/l	5/15	0.29	0.35
26	Cadmium (as Cd)	mg/l	0.003	<0.003	<0.003
27	Lead (as Pb)	mg/l	0.01	<0.01	<0.01
28	Mercury (as Hg)	mg/l	0.001	<0.001	<0.001
29	Total Arsenic (as As)	mg/l	0.01	<0.01	<0.01
30	Chromium Hexavalent	mg/l	--	<0.025	<0.025

Note: 1) --- Not Traceable

Table 6 - Physico-chemical characteristics of surface water quality

Sr. No.	Test Parameters	Unit	Acceptable / Permissible Limit	SW- PENCH River Near Esemba Village	SW- PENCH River Near
1	Colour*	Hazen Units	5/15	1.0	1.0
2	Odour*	--	Agreeable	Agreeable	Agreeable
3	Temperature	°C	--	24	24.0
4	pH value*	--	6.5 to 8.5	8.11	8.58
5	Total Suspended Solids (TSS)*	mg/l	--	2.0	1.60
6	Total Dissolved Solids*	mg/l	500/2000	391.0	394.0
7	Dissolved Oxygen*	mg/l	--	5.20	5.70
8	Cyanide (as CN)	mg/l	0.05	<0.05	<0.05
9	Biochemical Oxygen Demand (BOD)*	mg/l	--	<2.0	<2.0
10	Nitrite Nitrogen (as	mg/l	--	<0.01	<0.01

Sr. No.	Test Parameters	Unit	Acceptable / Permissible Limit	SW- Pench River Near Esemba Village	SW- Pench River Near
11	Calcium (as Ca)*	mg/l	75/200	43.2	44.8
12	Chloride (as Cl)*	mg/l	250/1000	11.9	40.5
13	Fluoride (as F)*	mg/l	1.0/1.5	0.51	0.47
14	Total Hardness(as	mg/l	200/600	172.0	188.0
15	Sulphate (as SO ₄)*	mg/l	200/400	2.99	38.9
16	Phenolic Compounds	mg/l	0.001/0.002	<0.001	<0.001
17	Cadmium (as Cd)	mg/l	0.003	<0.003	<0.03
18	Chromium Hexavalent	mg/l	--	<0.025	<0.025
19	Iron (as Fe) *	mg/l	1.0	0.63	0.46
20	Copper (as Cu)	mg/l	0.05/1.5	<0.01	<0.01
21	Lead (as Pb)	mg/l	0.01	0.011	0.01
22	Manganese (as Mn)	mg/l	0.1/0.13	<0.02	<0.02
23	Magnesium (as Mg)*	mg/l	30/100	15.6	18.5
24	Mercury (as Hg)	mg/l	0.001	<0.001	<0.001
25	Selenium (as Se)	mg/l	0.01	<0.01	<0.01
26	Zinc (as Zn)	mg/l	5/15	0.08	<0.04
27	Total Arsenic (as As)	mg/l	0.01	<0.01	<0.01
28	Oil & Grease	mg/l	--	<0.2	<0.2

Table 7 - Physico-chemical characteristics of waste water discharge

Sr. No.	Test Parameters	Unit	Acceptable/ Permissible Limit	Mine Discharge Near CHP	Mind Discharge Near Contractor Camp
1	Colour*	Haze n Units	5/15	2.0	2.0
2	Odour	--	Agreeable	Agreeable	Agreeable
3	pH value*	--	5.5 to 9.0	7.25	7.35
4	Temperature (Diff in receiving water & discharge effluent)	°C	Shall not exceed 5°C	24.0	24.0
5	Turbidity	NTU		24.0	16.3
6	Total Suspended Solids (TSS), mg/l*	mg/l		4.00	8.0

Sr. No.	Test Parameters	Unit	Acceptable/ Permissible Limit	Mine Discharge Near CHP	Mind Discharge Near Contractor Camp
7	Total Kjehldal Nitrogen (as NH ₃)	mg/l	100	3.85	6.30
8	Cyanide (as CN)	mg/l	0.2	<0.05	<0.05
9	Ammonia or Total Ammonical Nitrogen (TAN) (as total ammonia –N) *	mg/l	50	0.68	0.49
10	Biochemical Oxygen Demand (BOD)*	mg/l	30	6.00	6.0
11	Chemical Oxygen Demand	mg/l	250	60.0	64.0
12	Nitrite Nitrogen (as NO ₂)	mg/l	--	0.018	<0.01
13	Ortho Phosphate (as PO ₄)	mg/l	--	0.118	0.15
14	Calcium (as Ca)	mg/l	---	51.2	112.0
15	Chloride (as Cl)	mg/l	---	10.9	36.5
16	Free Residual Chlorine	mg/l	1.0	<0.1	<0.1
17	Fluoride (as F)*	mg/l	2.0	0.14	<0.2
18	Total Hardness(as CaCO ₃)	mg/l	---	216.0	430.0
19	Sulphate (as SO ₄)	mg/l		28.5	168.9
20	Sulphide (as S)	mg/l	2.0	<0.04	<0.04
21	Phenolic Compounds or Phenol (as C ₆ H ₅ OH)	mg/l	1.0	0.001	0.002
22	Aluminium (as Al)	mg/l	---	0.013	0.018
23	Cadmium (as Cd)	mg/l	1.0	<0.003	<0.003
24	Boron (as B)	mg/l	---	0.04	<0.06
25	Chromium Hexavalent (as Cr 6 ⁺)	mg/l	0.1	0.07	0.058
26	Iron (as Fe)*	mg/l	3.0	0.34	0.16
27	Nickel (as Ni)	mg/l	3.0	<0.02	<0.02
28	Copper (as Cu)	mg/l	3.0	<0.006	<0.01
29	Lead (as Pb)	mg/l	0.1	0.028	0.02
30	Manganese (as Mn)	mg/l	2.0	0.005	<0.02
31	Mercury (as Hg)	mg/l	0.01	0.002	0.002
32	Selenium (as Se)	mg/l	0.05	0.02	0.02
33	Zinc (as Zn)	mg/l	5.0	<0.04	<0.04

Sr. No.	Test Parameters	Unit	Acceptable/ Permissible Limit	Mine Discharge Near CHP	Mind Discharge Near Contractor Camp
34	Vanadium	mg/l	0.2	<0.01	<0.01
35	Total Arsenic (as As)	mg/l	0.2	0.018	0.015
36	Total Chromium (as Cr)	mg/l	2.0	<0.01	<0.01
37	Oil & Grease	mg/l	10	<0.2	<0.2

At all locations, Oil and grease, phenolic compounds, cyanides, sulphides and insecticides are found to be absent and all heavy metal values except Iron and Zinc are found to be below the detectable limit. In general, the water quality at all six locations are found to be well within the prescribed norms of IS: 10500 - 1991 (permissible) and IS: 2296 - 1982.

3.5 HYDROGEOLOGICAL SET- UP

In the Core Zone, sand and sandstone horizons serve as aquifers and shale/clay acts as aquicludes in alluvium/soil and Gondwanas formations respectively while in buffer zone the sand in Alluvium/Detrital Mantle and the secondary porous zones in Metamorphics act as aquifers. The various hydro-geological units developed in the study area are in the following table:

Table 8 Types of Aquifers in Study Area

Sl. No.	Type of Aquifer	Depth Range (m)	Core Zone	Buffer Zone
1.	Unconfined	0 – 24	Alluvium/Detr-ital Mantle & Kamthi	Alluvium/ Detrital Mantle, Kamthi and Weathered Talchir and Metamorphic.
2.	Semi-Confined/ Confined	Beyond 24	Sandstone horizons in Kamthi and Barakar	Sandstone horizon in Kamthi / Barakar /Talchir and secondary porous structures in Metamorphic.

The buffer zone is mostly covered by consolidated formations. Kamthi, Talchir & Metamorphics overlain by unconsolidated alluvium/Detrital Mantle. In general, Alluvium/ Detrital Mantle possess moderate to high porosity and infiltration factor.

Thus, the ground water potential is generally moderate to high in Alluvium / Detrital Mantle in the buffer zone area.

A. GROUND WATER LEVELS

To collect the representative groundwater levels in the study area, WCL through CMPDI, RI-IV, Nagpur has established a monitoring network with 28 dug wells and 9 piezometers (hydrograph stations) spread over the buffer zone (10 km radius from the Gondegaon Extn. OC Expn.). Out of these, 3 Piezometers (KDS-63, KDS-53 and KDS-55) are located in the core zone (within 3 km radius) of the project area. Water level monitoring in these dug wells has been done as per MoEF & CC guidelines (four times in a year).

The range of water levels, measured from the area in and around Gondegaon Extn. OC Expn. is given below

Pre monsoon period	Core Zone	6.25 m to 8.10 m
	Buffer zone	2.1 m to 15.5 m
Post monsoon period	Core Zone	2.10 m to 6.10 m
	Buffer zone	0.4 m to 15.5 m

B. WATER LEVEL TREND

Hydrographs of two permanent observation wells fixed by WCL through CMPDI, RI-IV, Nagpur has been prepared based on pre-monsoon (May) and post-monsoon (Nov) water level data from 2011 to 2017 and presented in below figures to assess the water level trend.

The post-monsoon and pre-monsoon water level trend from hydrographs of two permanent observation wells (B-31 & B-40) situated in buffer zone of Gondegaon Extn. OC Expn. respectively reveal steady trend of water level.

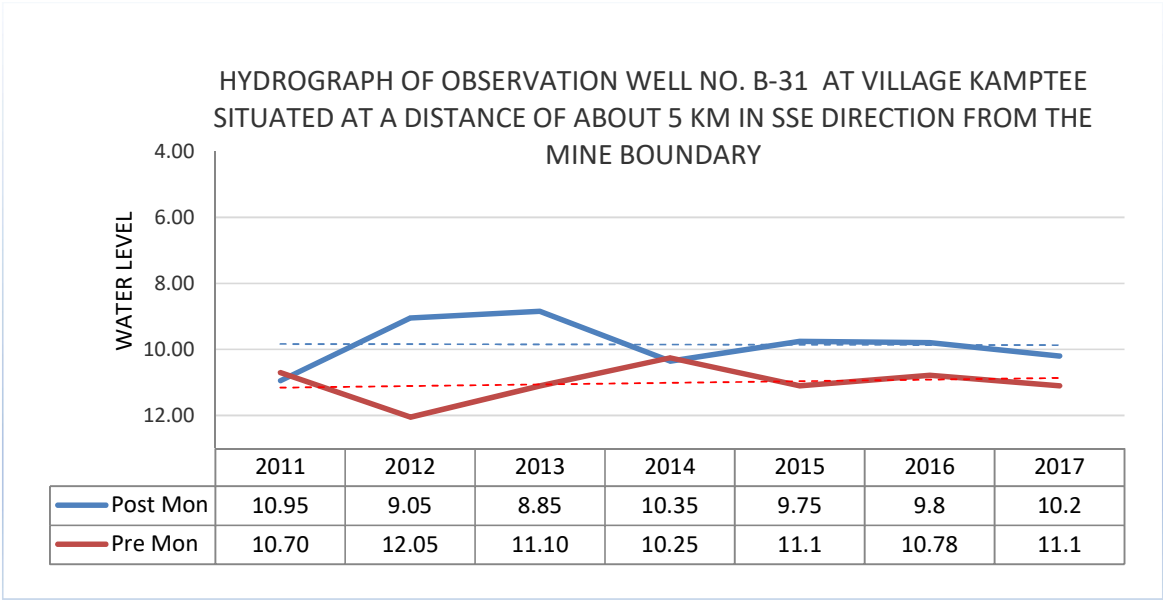


Figure 1 Hydrograph – Kamptee Village

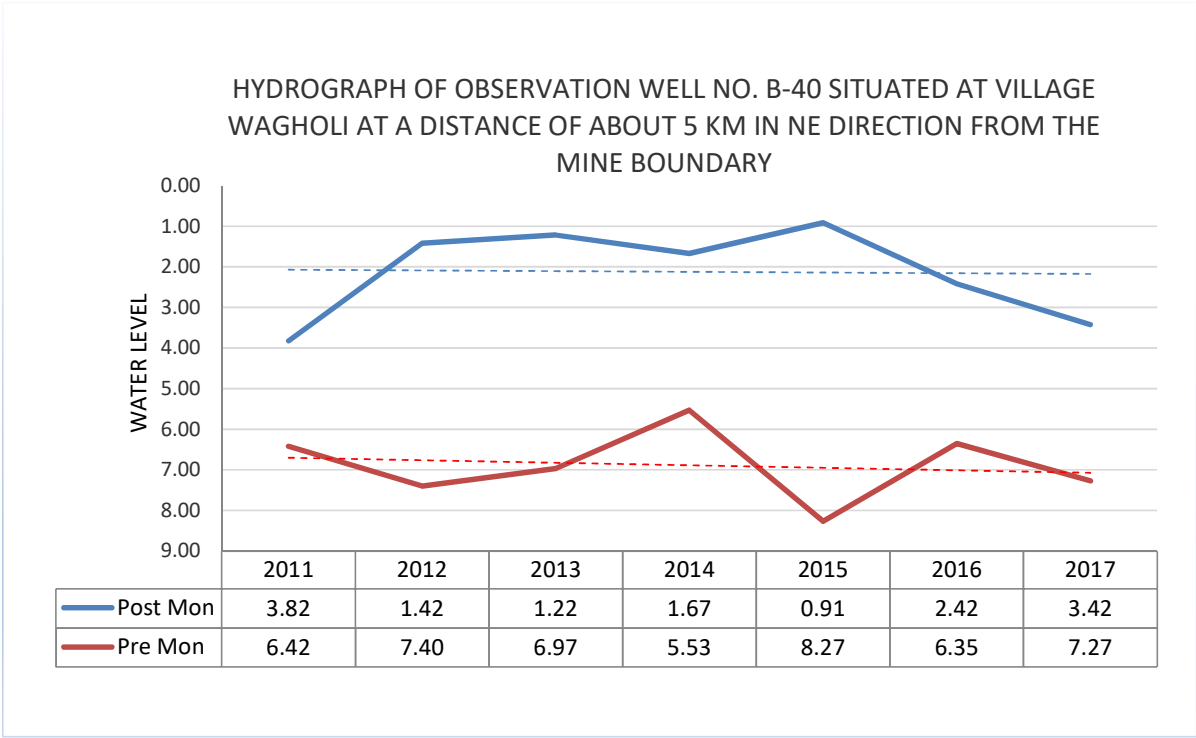


Figure 2 Hydrograph – Wagholi Village

C. GENERAL AQUIFER PARAMETERS

The aquifer parameters evaluated by CGWB at Silewara Colliery have been considered and attributed to the study area. The projected hydraulic parameters of the shallow aquifer in Alluvium, Kamthi and Deep aquifer in Kamthi / Barakar formations are as follows:

Table 9 Aquifer parameters of Gondagaon Extn. OC Expn. (Around 9-10 Km NW of mine)

Sl. No.	Aquifer Parameters	Shallow Aquifer in Detrital Mantle & Kamthi	Deep Aquifer (Upper Barakar)
1.	Transmissivity (m ² /day)	250	85
2.	Hydraulic Conductivity (m/day)	16	2
3.	Storage Co-efficient	5.8×10^{-4}	3.0×10^{-4}
4.	Leakance (m)	400	450
5.	Hydraulic Resistivity (days)	800	2,750
6.	Specific Yield	0.12	0.050

D. GROUNDWATER RESOURCES IN THE AREA

GROUNDWATER RECHARGE

Rainfall is the main recharge source for ground water. The study area receives an average annual rainfall of 1100 mm. Additionally, ground water is also being recharged from other sources such as return flow from mine water, irrigation water, ponds etc. The rainfall infiltration factor for Alluvium/Detrital Mantle on Talchir and Metamorphics has been considered to be 13% & 10% respectively while it is about 15% in Alluvium and Kamthis. The ground water balance computation for this study area of 314 sq.km. has been done as per GEC-1997 norms and is furnished below:

(a) Recharge from Rainfall

(i)	Alluvium/DM on Kamthi (57 sq.km)	...	9.405 MCM
(ii)	Alluvium/DM on Talchir (33 sq.km)	...	4.719 MCM
(i)	Alluvium/DM on Metamorphics (224 sq.km)	...	24.640 MCM

	Sub-Total	...	38.764 MCM

(b) Recharge from Other Sources

(i)	Irrigation Return Flow	...	0.76	MCM
(ii)	Recharge by Seepage from unlined channel	...	1.07	MCM
(iii)	Recharge from Return Flow of Mine Water	...	3.40	MCM

Sub-Total ... 5.23 MCM

(c)	Gross Ground Water Recharge (a+b)...	Total...	43.994	MCM
	Say...		44.000	MCM

GROUNDWATER DRAFT

The ground water withdrawal is generally for domestic, industry and irrigation requirement and is quantified as under:

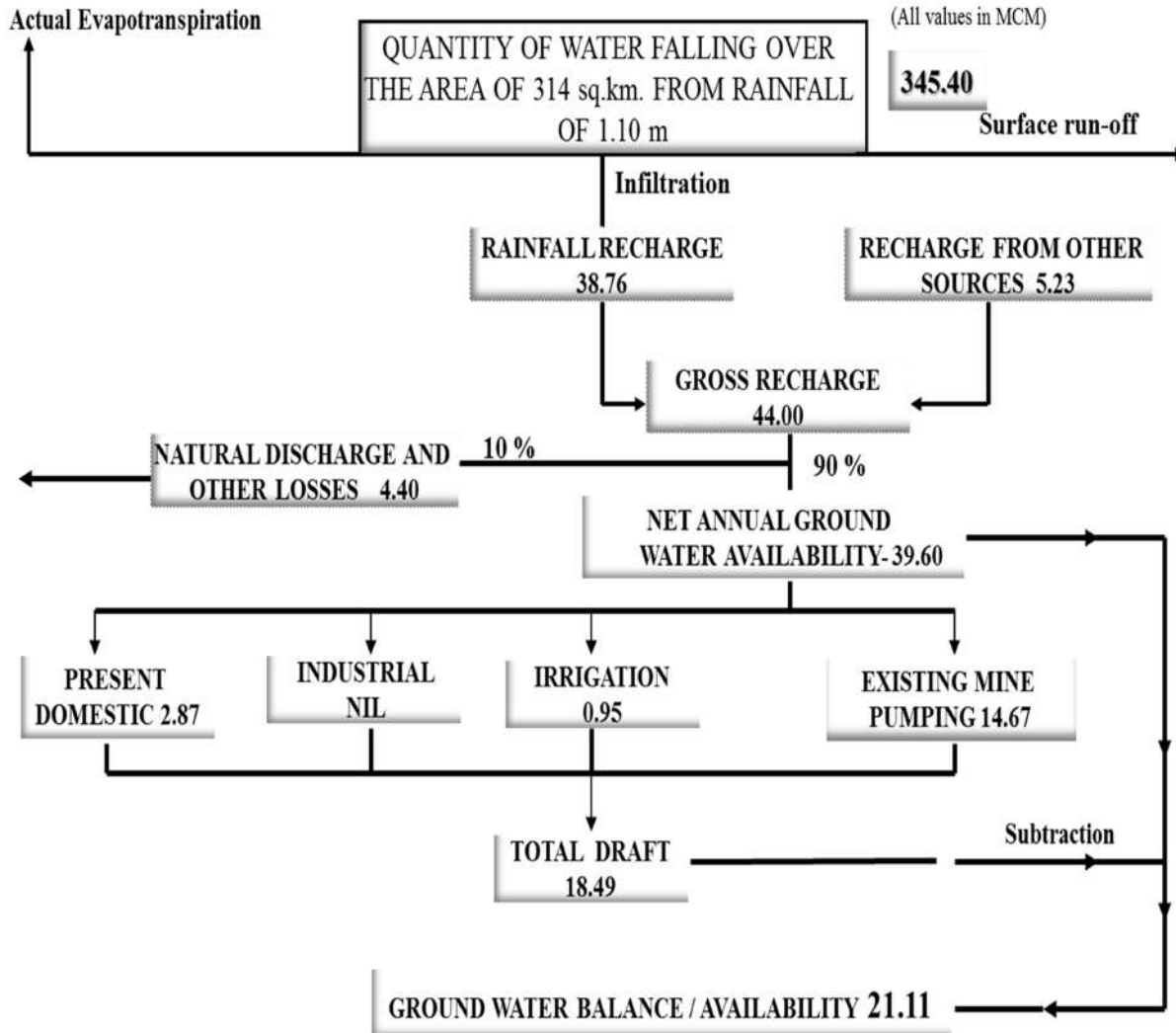
Table 10 Total Groundwater Draft for 'All Uses'

Sl. No.	Purpose	No./ Area	Water consumption per capita	Total qty of withdrawal (MCM)
1	a. Domestic (Human Population)	103678 nos.	70 lit. / day	2.64
	b. Domestic (Animals)	31400 nos.	20 lit. / day	0.23
2	Irrigation (for 120 days)	197.91 Ha	40000 lit/ha/day	0.95
3	Mine Pumping			14.67
Total				18.49

GROUNDWATER BALANCE:

i.	Gross ground water recharge	: 44.00 MCM
ii.	Natural discharge to drains & other	: 4.40 MCM
	Losses (approx. 10% of item (i))	
iii.	Net annual ground water availability	: 39.60 MCM
iv.	Annual ground water draft for all uses	: 18.49 MCM
v.	Ground water balance (item iii - IV)	: 21.11 MCM

GROUND WATER BALANCE OF GONDEGAON EXTN OC EXPN. MINE BUFFER ZONE



STAGE OF GROUNDWATER DEVELOPMENT:

Groundwater withdrawal / utilization is mainly for domestic and irrigation use in the study area. The level/stage of groundwater development computation in the present study is 46.69% which can be categorized as **"Safe"** with less than 70% value. As

per CGWB, Central Region, Nagpur the 'Stage of ground water development' in Parseoni tehsil, in which mine is located is 15.32%.

E. GROUND WATER QUALITY

The groundwater quality in the area is being monitored regularly (once in a year) by WCL through CMPDI, an ISO-9001 company and the results indicate the groundwater quality in the area is potable and does not contain any toxic elements. Generally, the water quality is nearly neutral in nature with pH value of 6.70 to 7.63 of potable quality with low concentration of total dissolved solids (TDS) i.e. 220 mg/l to 360 mg/l which is under desirable limit for drinking as per BIS 10500:2012. Normally, the coal mining activity does not induce any unwanted chemical or elements into the groundwater affecting the water chemistry except for total suspended solids (TSS); hence no serious pollutant is observed in the mine discharged water. Ground water quality analysis data in and around mine area is given table below:

Table 11 Ground Water Quality

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
				BINA VILLAGE FIELD, B-26 04.05.16	GOREGHAT, B-34 03.05.16	Desirable limit	PLV in the absence of alternate source
1	Colour Hz)	IS 3025 /04:1983, Platinum Cobalt	1	2	1	5	15
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	7.07	7.63	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:2009 EDTA	4.0	102	102	200	600
6	Iron -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	<0.06	0.3	No relaxation
7	Chlorides - mg/l	IS-3025/32:1988, Argentometric	2.0	38	30	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	<0.02	<0.02	0.2	1
9	Fluoride- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.54	0.34	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	240	220	500	2000

Description of Environment

CMPDI

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
				BINA VILLAGE FIELD, B-26 04.05.16	GOREGHAT, B-34 03.05.16	Desirable limit	PLV in the absence of alternate source
11	Calcium -mg/l	IS-3025/40:1991 EDTA	1.6	34	33	75	200
12	Magnesium - mg/l*	APHA, 22 nd Edition- Calculation EDTA	3	4	5	30	100
13	Copper -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	<0.03	0.05	1.5
14	Manganese - mg/l	IS-3025/59:2006 AAS-Flame	0.02	<0.02	<0.02	0.1	0.3
15	Sulphate -mg/l	APHA, 22 nd Edition Turbidity	2.0	42	36	200	400
16	Nitrates - mg/l	APHA, 22 nd Edition UV- Spectrophotometric Turbidity Nessler's	0.5	16	16	45	No relaxation
17	Cadmium - mg/l	APHA, 22 nd Edition AAS-GTA	0.0005	<0.0005	<0.0005	0.003	No relaxation
18	Lead -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	<0.005	0.01	No relaxation
19	Selenium –mg/l*	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	<0.005	0.01	No relaxation
20	Total Arsenic - mg/l*	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	<0.005	0.01	0.05
21	Zinc -mg/l	IS-3025/49:1994 AAS-Flame	0.01	<0.01	<0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	<0.01	0.05	No relaxation
23	Boron -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	146	112	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.02	<0.02	<0.02	0.02	No relaxation
26	Aluminum - mg/l*	APHA, 22 nd Edition AAS-GTA	0.03	<0.03	<0.03	0.1	0.2

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
				PIPRI, B-35 03.05.16	GONDEGAON, B-37 03.05.16	Desirable limit	PLV in the absence of alternate source
1	Colour Hz)	IS 3025 /04:1983, Platinum Cobalt	1	2	1	5	15

Description of Environment

CMPDI

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
				PIPRI, B-35 03.05.16	GONDEGAON, B-37 03.05.16	Desirable limit	PLV in the absence of alternate source
2	Odour	IS 3025 /05:1983, Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	3	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	6.80	6.70	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -	IS-3025/21:2009 EDTA	4.0	168	126	200	600
6	Iron -mg/l	IS-3025/53:2003 AAS-Flame	0.06	<0.06	<0.06	0.3	No relaxation
7	Chlorides - mg/l	IS-3025/32:1988, Argentometric	2.0	38	32	250	1000
8	Residual Chlorine -mg/l (min.)	APHA, 22 nd Edition DPD	0.02	0.02	<0.02	0.2	1
9	Fluoride- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.55	0.40	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	360	230	500	2000
11	Calcium -mg/l	IS-3025/40:1991 EDTA	1.6	32	38	75	200
12	Magnesium - mg/l*	APHA, 22 nd Edition- Calculation EDTA	3	21	7	30	100
13	Copper -mg/l	IS-3025/42:1992 AAS-Flame	0.03	<0.03	<0.03	0.05	1.5
14	Manganese - mg/l	IS-3025/59:2006 AAS-Flame	0.02	<0.02	<0.02	0.1	0.3
15	Sulphate -mg/l	APHA, 22 nd Edition Turbidity	2.0	88	32	200	400
16	Nitrates - mg/l	APHA, 22 nd Edition UV- Spectrophotometric Turbidity Nessler's	0.5	1.36	18	45	No relaxation
17	Cadmium - mg/l	APHA, 22 nd Edition AAS-GTA	0.0005	<0.0005	<0.0005	0.003	No relaxation
18	Lead -mg/l	APHA, 22 nd Edition AAS-GTA	0.005	<0.005	<0.005	0.01	No relaxation
19	Selenium – mg/l*	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	<0.005	0.01	No relaxation
20	Total Arsenic - mg/l*	APHA, 22 nd Edition AAS-VGA	0.005	<0.005	<0.005	0.01	0.05
21	Zinc -mg/l	IS-3025/49:1994 AAS-Flame	0.01	0.01	0.01	5	15
22	Total Chromium -mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	<0.01	<0.01	0.05	No relaxation

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
				PIPRI, B-35 03.05.16	GONDEGAON, B-37 03.05.16	Desirable limit	PLV in the absence of alternate source
23	Boron -mg/l	APHA, 22 nd Edition Carmine	0.2	<0.2	<0.2	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	140	110	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.02	<0.02	<0.02	0.02	No relaxation
26	Aluminum - mg/l*	APHA, 22 nd Edition AAS-GTA	0.03	<0.03	<0.03	0.1	0.2

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.

F. MINE DRAINAGE/PUMPING

The semi-consolidated Gondwanas are mostly stratified formations underlying the alluvium/soil. The permeable beds (Sandstone horizons) act as individual hydrogeological units and develop multi-aquifer system by the intercalation/interfringing of shale beds. As such under these circumstances, the groundwater flow/velocity along the bedding planes is higher than across the plane. It is imperative that horizontal hydraulic conductivity is many folds higher than the vertical hydraulic conductivity.

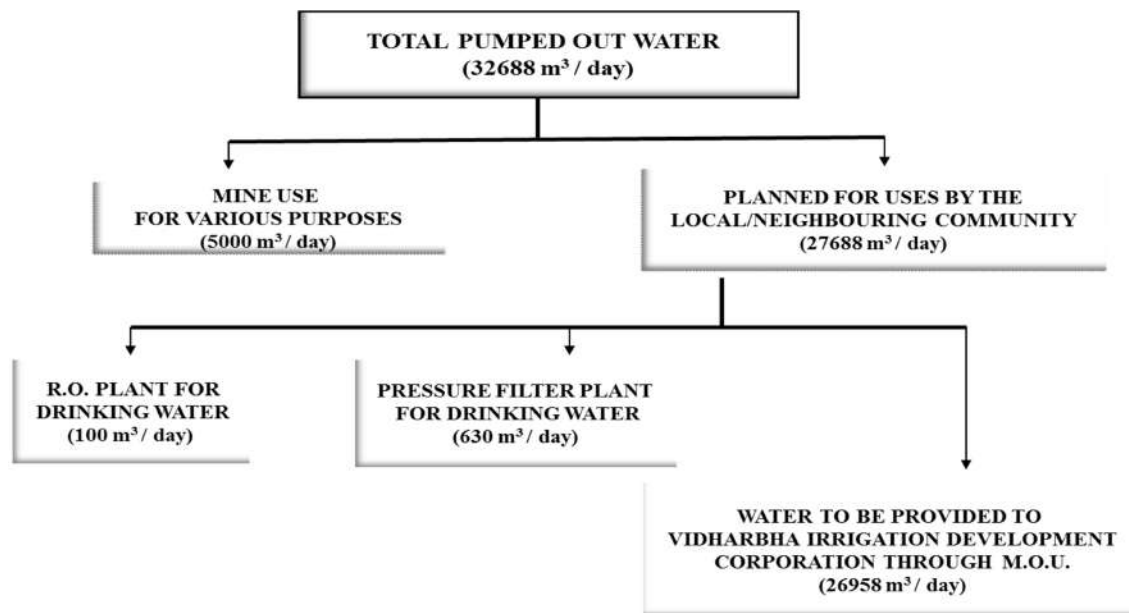
The opencast mine acts as large diameter well/sink resulted in by cutting /extraction of different aquifer zones/formations overlying the working coal seam. As soon as depression / pit is created due to mine cut, the initial discharge is generally heavy due to concentration of flow to that region thereby creating depletion/draw-down in water levels in the surrounding area and the inflow stabilizes due to partial desaturation. With increase in depth of incision, the semi-confined aquifer would also be exposed /punctured thereby the total system would be converted into water table condition and a cone of depression would be formed by the gravity drainage from different aquifer zones. In opencast mining, the unconfined aquifer is the most affected and the semi-confined aquifer is least affected. The mine effluent & influence is directly proportional to the mine area and depth.

Based on the Darcy's law (i.e. $Q = KIA$), the groundwater inflow from different mine faces of two quarries (Gondegaon and Ghatrohan) has been predicted.

Table 12 Mine inflow Prediction of Gondegaon Extn. OC Expn. Mine

	Aquifer type	Total Mine face length (L) in m.	Avg. saturated OB thickness (m)	Seepage Area (m^2) _(A)	Permeability m/d (K)	Hydraulic gradient (I)	Mine inflow (m^3/day) (Q)
Gondegaon Quarry (Existing)	Top Aquifer (Unconfined)	1600	20	32000	16	0.02	10240
	Bottom Aquifer (Confined)	1600	25	40000	2	0.02	1600
Ghatrohan Quarry (Proposed)	Top Aquifer (Unconfined)	1400	15	21000	16	0.02	6720
	Bottom Aquifer (Confined)	1400	25	35000	2	0.02	1400
Total							19960

Therefore, the total estimated mine value comes out to about $19960 m^3/d$ but, the actual mine seepage is $32688 m^3/d$ which is being utilized as given in the following diagram.



3.6 BASELINE AMBIENT NOISE QUALITY SCENARIO

To know the background Ambient Noise level of the Project site and its surrounding Environment, 6 locations (one in core zone and five in buffer zone) were identified for baseline study.

The noise level Monitoring Stations are given below in Table below:

Table 13 - Ambient Noise Level Monitoring Stations

Location Code	Location Name	Direction & distance w.r.t Project Site	Description
SN₁	Juni Kamptee Village	SW, 1.7 Km	Residential
SN₂	Gondegaon Transit Hostel	-	Residential
SN₃	Warada Village	NE, 1.5 Km	Residential
SN₄	Bid bina Village	SW, 1.0 Km	Residential
SN₅	Waregaon Village	SW, 2.5 Km	Residential
SN₆	Khairi Village	SW, 5.5 Km	Residential

Noise levels were recorded by using An Integrated Sound Level Meter, Type-2225, make B&K Denmark, from six ambient air quality locations during day time and night time at an interval of four hours for one day for two months.

Period: 22nd Oct 2018-11th Jan 2019.

Table 14 - Seasonal ambient noise level data during day time

Leq dB(A) During Day Time						
Month	SN ₁	SN ₂	SN ₃	SN ₄	SN ₅	SN ₆
Oct'18	51.2	52.3	48.9	49.4	52.1	57.7
Nov'18	51.7	51	52.3	51.6	51.4	51.1
Dec'18	50.5	50.9	51.8	50.1	49.1	50.2
Jan'19	50.8	51.2	51.3	49.7	49.5	50.1
Minimum	50.5	50.9	48.9	49.4	49.1	50.1
Maximum	51.7	52.3	52.3	51.6	52.1	57.7
Average	51.05	51.35	51.075	50.2	50.525	52.275

Table 15 - Seasonal ambient noise level data during night time

Leq dB(A) During Night Time						
Month	SN1	SN2	SN3	SN4	SN5	SN6
Oct'18	37.2	43.6	36.1	36.4	37.2	36.3
Nov'18	41.8	41.9	42.1	41.8	42.2	41.8

Dec'18	39.7	40.5	40.8	40.2	40.9	40.4
Jan'19	40	40.7	40.3	39.6	41.3	39.9
Minimum	37.2	40.5	36.1	36.4	37.2	36.3
Maximum	41.8	43.6	42.1	41.8	42.2	41.8
Average	39.675	41.675	39.825	39.5	40.4	39.6

3.6.1 Observation and Summary

Location Juna Kamptee Village (SN₁): The recorded noise levels were found in the range of 50.5 Leq dB(A) to 51.78 Leq dB(A) during day time and 37.2 to 41.8 Leq dB(A) during night time.

Gondegaon Transit Hostel (SN₂): The recorded noise levels were found in the range of 50.9 to 52.3 Leq dB(A) during day time and 40.5 to 43.6 Leq dB(A) during night time.

Warada Village (SN₃): The recorded noise levels were found in the range of 48.9 to 52.3 Leq dB(A) during day time and 36.1 to 42.1 Leq dB(A) during night time.

Bid Bina Village (SN₄): The recorded noise levels were found in the range of 49.4 to 51.6 Leq dB(A) during day time and 36.4 to 41.8 Leq dB(A) during night time.

Waregaon Village (SN₅): The recorded noise levels were found in the range of 49.1 to 52.1 Leq dB(A) during day time and 37.2 to 42.2 Leq dB(A) during night time.

Khairi Village (SN₆): The recorded noise levels were found in the range of 50.1 to 57.7 Leq dB(A) during day time and 36.3 to 41.8 Leq dB(A) during night time.

3.7 Flora & Fauna

In the core zone of the project under consideration, there is no forest land involved.

In the study area i.e within 10 km radius, there is no Reserve Forest or Sanctuary exist and no endangered species of flora & fauna were reported. The flora & fauna study details of adjacent mine, Kamptee Deep OC mine is included in this report.

FLORA

1. Agriculture crops
2. Commercial crops
3. Plantations done by the WCL/Forest Department
4. Natural vegetation /Forest type
5. Grassland vegetation
6. Endangered species
7. Endemic species
8. Aquatic flora

FAUNA

1. Total listing of faunal elements
2. Endangered species (as per Indian Wildlife act)
3. Endemic species
4. Migratory species
5. Migratory corridors or Paths
6. Breeding and spawning grounds
7. Aquatic fauna.

TERRESTRIAL FLORA

Terrestrial flora of the region was classified in to natural vegetation of forest origin, agro-ecosystems of agriculture crop varieties, cash crops of commercial importance and agro-forestry species raised as plantations by the Western Coal Fields (WCL) and Forest department in the vicinity of mining project areas.

Agricultural Crops:

To a greater extent two times in a year the crops are cultivated during the south west monsoon months of July to October (Karif) and winter months of November to January (Rabi). The cropping pattern is greatly varied from mixed crops in low lands to mono crop varieties of dry land areas. The crop varieties, which are cultivated in core and buffer zones of the project, are presented in tables below.

Commercial Crops:

Commercial crop varieties like pulses and oil seeds are cultivated in the crop lands of the project areas along with traditional crop varieties during the post-monsoon period of December and January for subsistence income generation of local communities. The checklist list of commercial crops of the project areas are shown in Tables below.

Plantations / Agro Forestry Species:

The Agro forestry species are found to be raised as plantations in farm lands and cultivable waste lands of the village outskirts, on the banks of non-perennial streams, rivulets and at road side vacant areas. The agro forestry species of core zone and buffer zones are listed in tables below.

Natural Vegetation / Forest Types:

The natural flora is classified as dry mixed deciduous forest flora of trees, shrubs and herbaceous communities. The flora of the region is succeeded in to three layer stratification of top storey of canopy layer, middle storey and lower story of ground level. Natural vegetation was found to be in degraded status in the mining areas of core zone with grassy slopes and discontinuous dry deciduous thickets of xerophytes. A systematic list of plant species of the core and buffer zones is presented in tables below.

Flora of Core Zone:**List of Agricultural Crops cultivated in Core zone**

Crop variety	Family name	Botanical name	Local/Trade name
Vegetables	Amaranthaceae	<i>Abelmoschus esculentus</i>	Bhendi
	Cucurbitaceae	<i>Coccinia indica</i>	Kundru
	Solanaceae	<i>Capsicum annum</i>	Mirchi
		<i>Solanum melongena</i>	Brinjal

List of Cash (Commercial) Crops in Core Zone

Crop variety	Family name	Botanical name	Local /Trade name
Not Applicable	Na	Na	Na

List of Agro forestry species of Core Zone

Family name	Botanical name	Local/Trade name
Anacardiaceae	<i>Mangifera indica</i>	Aam/Mango
Caesalpinaceae	<i>Tamarindus indica</i>	limli/Tamarind Tree
Cemaruhiaceae	<i>Ailanthus excelsa</i>	Maharukh
Euphorbiaceae	<i>Phyllanthus emblica</i>	Awla/Indian goose berry
	<i>Pongamia pinnata</i>	Karanj/Beech tree
Graminae	<i>Bambusa arundinaceae</i>	Bamboo
Meliaceae	<i>Azadirachta indica</i>	Neem
Mimosaceae	<i>Acacia catechu</i>	Khair
	<i>Acacia auaculiformis</i>	Babool
	<i>Albizia lebeck</i>	Shirish
Myrtaceae	<i>Syzygium cumini</i>	Amrud
Rhamnaceae	<i>Zyzyphus jujube</i>	Bhor
Verbenaceae	<i>Tectona grandis</i>	Sagwan

List of Natural (vegetation) Flora Core Zone Area**(a) Canopy /Upper layer – Tree flora**

Family name	Botanical name	Local/Trade name
Anacardiaceae	<i>Semecarpus anacardium</i>	Bibba
Annonaceae	<i>Annona squamosa</i>	Sitaphal
Caesalpinaceae	<i>Bahunia racemosa</i>	Apta
	<i>Cassia fistula</i>	Bahawa
	<i>Tamarindus indica</i>	Church
Cemaruhiaceae	<i>Ailanthus excelsa</i>	Maharukh
Combretaceae	<i>Anogiessus latifolia</i>	Dhawda

Family name	Botanical name	Local/Trade name
Ebenaceae	<i>Diospyros melanoxylon</i>	Tendu
Euphorbiaceae	<i>Phyllanthus emblica</i>	Awla
Fabaceae	<i>Butea monosperma</i>	Palas
	<i>Dalbergia paniculata</i>	Dhobin
	<i>D. sisso</i>	Sisam
	<i>Erythrina variegata</i>	Kasai
	<i>Pongamia pinnata</i>	Karanj
	<i>Pterocarpus marsupium</i>	Bija
Graminae	<i>Bambusa arundinaceae</i>	Katang bamboo
Lecythidaceae	<i>Careya arborea</i>	Kunbhi
Lythraceae	<i>Lagerstroemia parviflora</i>	Lendia/lenda
Meliaceae	<i>Azadirachta indica</i>	Neem
Mimosaceae	<i>Acacia araculiformis</i>	Babul
	<i>A. catechu</i>	Khair
	<i>A. nilotica</i>	Babul
	<i>Albizzia lebbeck</i>	Sirish
	<i>Cassia siamea</i>	Kashid
	<i>Leucaena leucocephala</i>	Subabul
Moraceae	<i>Ficus bengalensis</i>	Vad
	<i>F. religiosa</i>	Pipal
Moringaceae	<i>Moringa critifolia</i>	Aal
Myrtaceae	<i>Syzygium cumini</i>	Jamun
Palmae	<i>Borassus flabellifer</i>	Sindhi
Rhamnaceae	<i>Zizyphus mauritiana</i>	Ber
Rutaceae	<i>Chloroxylon swietenia</i>	Behura
Sapindaceae	<i>Schleichera oleosa</i>	Kusumb
Sterculiaceae	<i>Sterculia urnes</i>	Karaj
Tiliaceae	<i>Grewia tilifolia</i>	Dhaman
Verbenaceae	<i>Tectona grandis</i>	Sagwan

(b) Middle layer – Tress & Climbers

Family name	Botanical name	Local/ Trade name
Celastraceae	<i>Maytenus emarginata</i>	Bharati
Combretaceae	<i>Calycopteris floribunda</i>	Gilibuli
	<i>Combretum ovalifolium</i>	Piwarvel
Convolvulaceae	<i>Argyria nervosa</i>	Rakath vel
	<i>Ipomoea quionequit</i>	Ganesh vel
	<i>I. eriocarpa</i>	Boota
	<i>I. palmata</i>	Ghiabato
Euphorbiaceae	<i>Ricinus communis</i>	Arandi
Fabaceae	<i>Abrus precartorious</i>	Gunj
Flocourtiaceae	<i>Flacourtia indica</i>	Kakai
Minispermaceae	<i>Cocculus hirsutus</i>	Vasan vel
Periplocaceae	<i>Cryptolepis buehanani</i>	Dhdhi

Rhamnaceae	<i>Ventilago denticulate</i>	Lokhandi
	<i>Zizypus juzuba</i>	Bhor
	<i>Z. oenoplia</i>	Eroni
Tiliaceae	<i>Grewia hirsute</i>	Gaturli
Verbenaceae	<i>Lantana camara</i>	Raimunia
	<i>Vitex nigunda</i>	Nirgundi

(c) Ground layer – Shrubs & Herbs

Family name	Botanical name	Local/ Trade name
Acanthaceae	Andropogon pumilus	Diwartan
	<i>Barleria prionitis</i>	Katekoranti
	<i>Amaranthus spinosus</i>	Kate chawli
Asclepidaceae	<i>Hygrophylla sculli</i>	Na
Compositae	<i>Tridax procumbens</i>	Kamarmodi
	<i>Parthenium hysterophorus</i>	Gajar gawat
	<i>Spilanthus acmella</i>	Na
	<i>E. nummularis</i>	Na
	<i>Merremia emarginata</i>	Undir khani
Euphorbiaceae	<i>Euphorbia hirta</i>	Dhudhi
Fabaceae	<i>Alysicarpus monilifer</i>	Na
	<i>Desmodium dichotomum</i>	Na
	<i>I. cordifolia</i>	Na
	<i>Tephrosia hamiltonii</i>	Divali
	<i>Lavendula bipinnata</i>	Na
	<i>Leucas biflora</i>	Na
Malvaceae	<i>Hibiscus lobatus</i>	Na
	<i>H. ovalifolius</i>	Na
	<i>Sida acuta</i>	Na
Mimosaceae	<i>Mimosa pudica</i>	Lajavanti
Myrtaceae	<i>Rotala tenuis</i>	Na
Nyctaginaceae	<i>Boerhavia diffusa</i>	Na
Ranunculaceae	<i>Cleome viscosa</i>	Pivili tilwan
Rubiaceae	<i>Borreria articularis</i>	Na
	<i>Physalis minima</i>	Na
Zygophyllaceae	<i>Tribulus terrestris</i>	Goakru

Grass Lands:

No prominent grass land ecosystem has been found in the Core zone area. However the grasslands are mixed with natural vegetation of low lands and in cultivated fields. The grasses and sedges of core zone are listed in below.

List of Grasses and Sedges of Core Zone

Family name	Botanical name	Local /Trade name
Cyperaceae	<i>Kyllina tenuifolia</i>	N/a
Graminae	<i>Aristida hystrix</i>	N/a
	<i>Chloris barbata</i>	N/a
	<i>Dactylocten aegyptiaca</i>	N/a
	<i>Digitaria ternate</i>	N/a
	<i>Eragrastiella bifaria</i>	N/a
	<i>Eragrastis ciliaris</i>	N/a
	<i>Eragrastis ciliaris</i>	N/a

Endangered Flora: No endangered plant species in Core zone.

List of Endangered Flora of Core Zone

Family name	Botanical name	Local /Trade name
Not Applicable	N/a	N/a

Endemic Flora: No endemic plant species have been found in Core zone.

List of Endemic Flora of Core Zone

Family name	Botanical name	Local /Trade name
Not Applicable	N/a	N/a

1.8. Aquatic Flora:

No perennial aquatic bodies are present in the Core zone. The following aquatic flora observed in the village ditches and small ponds.

Aquatic plants of Core zone of Project areas

Family name	Botanical name	Local/Trade name
Not Applicable	N/a	N/a

Flora of Buffer Zone

List of Agricultural Crops in Buffer Zone

Crop variety	Family name	Botanical name	Local / Trade name

Cereals	Poaceae	<i>Zey mays</i>	Makkha/Maize
		<i>Triticum aestivum</i>	Wheat
Pulses	Fabaceae	<i>Cajanus cajan</i>	Arhar/Tuar
		<i>Cicer arietinum</i>	Channa
		<i>Phaseolus mungo</i>	Mung
		<i>Phaseolus aconitifolius</i>	Moth
Vegetables	Amaranthaceae	<i>Abelmoschus esculentus</i>	Bhendi
	Cucurbitaceae	<i>Coccinia indica</i>	Kundru
	Solanaceae	<i>Capsicum annum</i>	Mirchi
		<i>Lycopersicon lycopersicum</i>	Tomato
		<i>Solanum melongena</i>	Brinjal

List of Cash (Commercial) Crops in Buffer Zone

Crop variety	Family name	Botanical name	Local /Trade name
Pulses	Fabaceae	<i>Cajanus cajan</i>	Tuar
		<i>Phaseolus mungo</i>	Mung
		<i>Dolichos lablab</i>	Sem
	Solanaceae	<i>Lycopersicon lycopersicum</i>	Tomato
	Linaceae	<i>Linum usitatissimum</i>	Alsi/Linseed
Seeds	Leguminaceae	<i>Glycine max</i>	Soybean
	Euphorbiaceae	<i>Ricinus communis</i>	Caster Oil
Flowers	Malvaceae	<i>Gossipium hersutum</i>	Cotton

List of Agro Forestry Species in Buffer Zone

Family name	Botanical name	Local/Trade name
Anacardiaceae	<i>Mangifera indica</i>	Aam/Mango
Caesalpinaceae	<i>Tamarindus indica</i>	limli/Tamarind Tree
Cemaruhiaceae	<i>Ailanthus excelsa</i>	Maharukh
Combretaceae	<i>Terminalia arjuna</i>	Arjun
Euphorbiaceae	<i>Phyllanthus emblica</i>	Awla/Indian goose berry
Fabaceae	<i>Dalbergia sisso</i>	Shesam/Rose wood
	<i>Pongamia pinnata</i>	Karanj/Beech tree
Graminae	<i>Bambusa arundinaceae</i>	Bamboo
Meliaceae	<i>Azadirachta indica</i>	Neem
Mimosaceae	<i>Acacia catechu</i>	Khair
	<i>A. auaculiformis</i>	Babool
	<i>Albizzia lebbeck</i>	Shirish
Myrtaceae	<i>Syzygium cumini</i>	Amrud
Rhamnaceae	<i>Zyzyphus jujube</i>	Bhor
Verbenaceae	<i>Tectona grandis</i>	Sagwan

List of Flora (Natural Vegetation) of Buffer Zone

(a) Canopy /Upper Story – Tree flora

Family name	Botanical name	Local/Trade name

Anacardiaceae	<i>Semecarpus anacardium</i>	Bibba
Annonaceae	<i>Annona squamosa</i>	Sitaphal
Caesalpinaceae	<i>Bahunia racemosa</i>	Apta
	<i>Cassia fistula</i>	Bahawa
	<i>Parkinsonia aculeate</i>	Vedi-babul
	<i>Peltophorum pterocarpum</i>	Rusty shield bearer
	<i>Tamarindus indica</i>	Chunch
Cemaruhiaceae	<i>Ailanthus excelsa</i>	Maharukh
Combretaceae	<i>Anogiessus latifolia</i>	Dhawda
	<i>Terminalia alata</i>	Ain
	<i>T. arjuna</i>	Arjun/Kahu
	<i>T. chebula</i>	Hirda
Ebenaceae	<i>Diospyros melanoxylon</i>	Tendu
Euphorbiaceae	<i>Phyllanthus emblica</i>	Awla
Fabaceae	<i>Butea monosperma</i>	Palas
	<i>Dalbergia paniculata</i>	Dhobin
	<i>D. sisso</i>	Sisam
	<i>Erythrina variegata</i>	Kasai
	<i>Pongamia pinnata</i>	Karanj
	<i>Pterocarpus marsupium</i>	Bija
Graminae	<i>Bambusa arundinaceae</i>	Katang bamboo
Lecythidaceae	<i>Careya arborea</i>	Kunbhi
Leeaceae	<i>Leea crispa</i>	Kuram
Lytheraceae	<i>Lagerstroemia parviflora</i>	Lendia/lenda
Meliaceae	<i>Azadirachta indica</i>	Neem
Mimosaceae	<i>Acacia araculiformis</i>	Babul
	<i>A. catechu</i>	Khair
	<i>A. nilotica</i>	Babul
	<i>Albizzia lebbeck</i>	Sirish
	<i>A. odoratisima</i>	Shinchuva
	<i>A. procera</i>	Pandra
	<i>Cassia siamea</i>	Kashid
	<i>Leucaena leucocephala</i>	Subabul
Moraceae	<i>Ficus bengalensis</i>	Vad
	<i>F. religiosa</i>	Pipal
Moringaceae	<i>Moringa critifolia</i>	Aal
Palmae	<i>Borassus flabellifer</i>	Sindhi
Rhamnaceae	<i>Zizyphus mauritiana</i>	Ber
Rutaceae	<i>Chloroxylon swietenia</i>	Behura
Sapindaceae	<i>Schleichera oleosa</i>	Kusumb
Sterculiaceae	<i>Sterculia urnes</i>	Karaj
	<i>Waltheria americana</i>	Safed bendi
Tiliaceae	<i>Grewia tilifolia</i>	Dhaman
Verbenaceae	<i>Tectona grandis</i>	Sagwan

(b) Middle Story – Tress & Climbers

Family name	Botanical name	Local/ Trade name

Family name	Botanical name	Local/ Trade name
Asclepidaceae	<i>Damia extensa</i>	Utaranvel
Celastraceae	<i>Maytenus emarginata</i>	Bharati
Combretaceae	<i>Calycopteris floribunda</i>	Gilibuli
	<i>Combretum ovilifolium</i>	Piwarvel
Convolvulaceae	<i>Argyria nervosa</i>	Rakath vel
	<i>Cuscuta reflexa</i>	Amar vel
	<i>Ipomoea quiomequit</i>	Ganesh vel
	<i>I. eriocarpa</i>	Boota
	<i>I. palmata</i>	Ghiabato
	<i>I. absucura</i>	Dopateluta
Discoreaceae	<i>Dioscorea bulbifera</i>	Akas vel
Euphorbiaceae	<i>Kirganelia reticulate</i>	Pitundi
	<i>Securengia virosa</i>	Dhani
Fabaceae	<i>Abrus precartorious</i>	Gunj
	<i>Butea superba</i>	Palas vel
Flocourtiaaceae	<i>Flacourtia indica</i>	Kakai
Minispermaceae	<i>Cocculus hirsutus</i>	Vasan vel
Nyctaginaceae	<i>Nyctanthus arbortristis</i>	Kharasi
Periplocaceae	<i>Cryptolepis buehanani</i>	Dhdhi
Rhamnaceae	<i>Ventilago denticulate</i>	Lokhandi
	<i>Zizypus juzuba</i>	Bhor
	<i>Z. oenoplia</i>	Eroni
	<i>Z. glaberrima</i>	Ghoti
Tiliaceae	<i>Grewia hirsute</i>	Gaturli
Verbenaceae	<i>Lantana camara</i>	Raimunia
	<i>Vitex nigunda</i>	Nirgundi

(d) Lower Storey – Shrubs & Herbs

Family name	Botanical name	Local/ Trade name
Acanthaceae	<i>Andropogon pumilus</i>	Diwartan
	<i>Barleria prionitis</i>	Katekoranti
Amaranthaceae	<i>Achyranthus aspera</i>	Chirchitta
	<i>Amaranthus spinosus</i>	Kate chawli
Caesalpinaceae	<i>Cassia absus</i>	Kan kuti
Compositae	<i>Tridax procumbens</i>	Kamarmodi
	<i>Parthenium hysterophorus</i>	Congress weed
	<i>Spilanthus acmella</i>	Gajar gawat
Cleomaceae	<i>Cleome viscosa</i>	N/a
Convolvulaceae	<i>Evolvulus alsinoides</i>	N/a
	<i>E. nummularis</i>	N/a
	<i>Merremia emarginata</i>	Undir khani
Euphorbiaceae	<i>Euphorbia hirta</i>	Dhudhi
	<i>E. rosea</i>	N/a
Fabaceae	<i>Alysicarpus monilifer</i>	N/a
	<i>Indigofera linifolia</i>	N/a
	<i>I. cordifolia</i>	N/a

Family name	Botanical name	Local/ Trade name
	<i>Tephrosia hamiltonii</i>	Divali
Labiataeae	<i>Hyptis suaveolens</i>	N/a
	<i>Ocimum sanctum</i>	Tulsi
	<i>Ocimum basilicum</i>	Rantulsi
	<i>Leucas biflora</i>	N/a
Liliaceae	<i>Gloriosa superba</i>	Khadyanag
Malvaceae	<i>Hibiscus lobatus</i>	N/a
	<i>H. ovalifolius</i>	N/a
	<i>Sida acuta</i>	N/a
Martinaceae	<i>Martynia annua</i>	Waghnakhi
Mimosaceae	<i>Mimosa pudica</i>	Lajavanti
Myrtaceae	<i>Rotala tenuis</i>	N/a
Nyctaginaceae	<i>Boerhavia diffusa</i>	N/a
Oxalidaceae	<i>Oxalis corniculata</i>	Tipani
Ranunculaceae	<i>Cleome viscosa</i>	Pivili tilwan
Rubiaceae	<i>Borreria articularis</i>	N/a
Solanaceae	<i>Datura metal</i>	Kala dhotra
	<i>Physalis minima</i>	N/a
Zygophyllaceae	<i>Tribulus terrestris</i>	Goakru

Grass Lands:

No prominent grass land ecosystem has been found in the core zone area. However the grasslands are mixed with natural vegetation of low lands and in cultivated fields. The grasses and sedges of Buffer zone are listed in Table below.

List of Grasses and Sedges of Buffer Zone

Family name	Botanical name	Local /Trade name
Cyperaceae	<i>Kyllina tenuifolia</i>	Na
	<i>Scleria annularis</i>	Na
Graminae	<i>Apluda mutica</i>	Phulkia
	<i>Aristida hystrix</i>	Na
	<i>Chloris barbata</i>	Na
	<i>Cymbapogon martini</i>	Tikhadi
	<i>Dactylocten aegyptiaca</i>	Na
	<i>Digitaria ternate</i>	Na
	<i>Eleusine indica</i>	Na
	<i>Eragrastiella bifaria</i>	Na
	<i>Eragrastis ciliaris</i>	Na

Endangered Flora: No endangered plant species in Core zone.

List of Endangered Flora of Buffer Zone

Family name	Botanical name	Local /Trade name
Not Applicable	N/a	N/a

Endemic Flora: No endemic plant species have been found in Core zone.

List of Endemic Flora of Buffer Zone

Family name	Botanical name	Local /Trade name
Not Applicable	N/a	N/a

Aquatic Flora:

No perennial aquatic bodies are present in the Core zone. The following aquatic flora observed in the village ditches and small ponds.

Aquatic plants of Buffer Zone

Family name	Botanical name	Local/Trade name
Convolvulaceae	<i>Ipomoea aquatica</i>	Water spinach
Ceratophyllaceae	<i>Ceratophyllum sp.</i>	-
Gentianaceae	<i>Nymphoides indica</i>	Floating leaf
Hydrocharitaceae	<i>Vallisneria spiralis</i>	-
	<i>Hydrilla verticillata</i>	-
Nelumbonaceae	<i>Nelumbo nucifera</i>	Lotus

TERRESTRIAL FAUNA

Fauna of Core Zone

Faunal diversity is very negligible in project areas of the core zone as the habitat conditions are not being suitable for the distribution of important wildlife fauna. The Check lists of faunal groups of the Core zone are presented in tables below.

Checklist of Terrestrial Fauna of Core zone

(a) Mammals

Zoological name	Common name	Status in Wildlife(Protection) Act
<i>Presbytis entellus</i>	Common Langur	Schedule-II, Part I, section 1A
<i>Rousettus leschenaulti</i>	Indian Fulvous Fruit- Bat	Schedule-V, Section, 3
<i>Mus booduga</i>	Indian Field Mouse	Schedule-V, Section, 5
<i>Mus rattus rattus</i>	Common House Rat	Schedule-V, Section, 6
<i>Bandicota bengalensis</i>	Bandicoot Rat	Schedule-V, Section, 6

<i>Herpestes edwardsi</i>	Indian Grey Mongoose	Schedule-IV, Section, 6A

(b) Birds

Zoological name	Common name	Status in Wildlife(Protection) Act
<i>Bubulcus ibis</i>	Cattle egret	Schedule-IV, Section, 11
<i>Ardeola grayii</i>	Indian pond heron	Schedule-IV, Section, 11
<i>Milvus migrans</i>	Black kite	Schedule-IV, Section, 11
<i>Streptopelia chinensis</i>	Spotted dove	Schedule-IV, Section, 11
<i>Alcedo atthis</i>	Small blue kingfisher	Schedule-IV, Section, 11
<i>Halcyon smyrensis</i>	White-breasted kingfisher	Schedule-IV, Section, 11
<i>Merops orientalis</i>	Small bee-eater	Schedule-IV, Section, 11
<i>Acridotheres tristis</i>	Common myna	Schedule-IV, Section, 11
<i>Sturnus contra</i>	Asian pied starling	Schedule-IV, Section, 11
<i>Venellus indicus</i>	Red-wattled lapwing	Schedule-IV, Section, 11
<i>Chardrius dubius</i>	Little ringed flover	Schedule-IV, Section, 11
<i>Psittakula krameri</i>	Rose ringed parakeet	Schedule-IV, Section, 11
<i>Pyccnonotus cafer</i>	Red-vented bulbul	Schedule-IV, Section, 11
<i>Coracias benghalensis</i>	Indian roller	Schedule-IV, Section, 11
<i>Turdoides caudatus</i>	Common babbler	Schedule-IV, Section, 11
<i>Centropus sinensis</i>	Crow pheasant	Schedule-IV, Section, 11
<i>Dicrurus adsimilis</i>	Black Drongo	Schedule-IV, Section, 11
<i>Carvus splendens</i>	House crow	Schedule—V, Section, 1
<i>Passer domesticus</i>	House sparrow	Schedule-IV, Section, 11

(c) Reptiles

Zoological name	Common name	Status in Wild life(Protection) Act
Calotes versicolor	Garden Lizard	N/a

(d) Amphibians

Zoological name	Common name	Status in wildlife (Protection) Act
Bufo melanostictus	Common frog	N/a

(e) Butter flies

Zoological name	Common name	Status in wildlife(Protection) Act
Not Applicable	N/a	N/a

Endangered Species (as per Wildlife (Protection) Act): No Endangered fauna was recorded in Core Zone.

Checklist of Endangered species of Core zone

Zoological name	Common name	Status in Wild life(Protection) Act
Not Applicable	N/a	N/a

Endemic Species of the Project areas: No endemic species were observed in Core Zone

Checklist of Endemic species of Core zone

Zoological name	Common name	Status in Wild life (Protection) Act
Not Applicable	N/a	N/a

Migratory species of the Project areas: No migratory fauna was observed in Core Zone

Checklist of Migratory species of Core zone

Zoological name	Common name	Status in Wild life (Protection) Act
Not Applicable	N/a	N/a

Migratory corridors and Flight paths: No Migratory Corridors and Flight paths were Present in Core zone.

Migratory corridors of Core zone

Name of the area	Location	Protected status
Not Applicable	N/a	N/a

Breeding and Spawning grounds: No breeding and spawning grounds were earmarked for the wildlife fauna in Core zone.

Breeding and spawning grounds of Core zone

Name of the area	Location	Protected status
Not Applicable	Na	Na

Aquatic Fauna: Aquatic fauna belongs to Fin-fish (Fishes), Shell-fish (Mollusc) and Crustaceans (Prawns) of commercial value. The checklist of aquatic fauna of Core zone is presented in table below.

Checklist of Aquatic fauna of Core Zone

(a) Fishes:

Zoological name	Common name	Status in Wild life(Protection)Act
<i>Clarias batrachus</i>	Magur	Not Applicable
<i>Mugil cephalous</i>	Mullet	Not Applicable
<i>Catla catla</i>	Catla	Not Applicable

(b) Crustaceans

Zoological name	Common name	Status in Wild life(Protection) Act
<i>Macrobrachium rosenbergi</i>	Freshwater Prawn	Not Applicable

(c) Mollusc

Zoological name	Common name	Status in Wild life(Protection) Act
<i>Littorina</i> sp.	Common snail	Not Applicable

Fauna of Buffer Zone:

The buffer zone areas of the project are providing with suitable habitats for the distribution of wildlife fauna like mammals. The bird's fauna is conspicuous in the buffer zone areas. The fauna of the buffer zone areas are listed in table below.

Checklist of Terrestrial Fauna of Buffer zone**(a) Mammals**

Zoological name	Common name	Status in Wildlife(Protection) Act
<i>Rousettus leschenaulti</i>	Indian Fulvous Fruit-bat	Schedule-V, Section 3
<i>Presbytis entellus</i>	The Common Langur	Schedule-II, Part-I, Section, 4A
<i>Mus booduga</i>	Indian Field Mouse	Schedule-V, Section, 5
<i>Mus rattus rattus</i>	Common House Rat	Schedule-V, Section, 6
<i>Bandicota bengalensis</i>	Bandicoot Rat	Schedule-V, Section, 6
<i>Herpestes edwardsi</i>	Indian Grey Mongoose	Schedule-IV, Section, 6A
<i>Lepus nigricollis nigricollis</i>	Black napped Hare	Schedule-IV, Section, 3A
<i>Felis chaus</i>	Jungle Cat	Schedule-II, Part-II, Section, 2C
<i>Vulpes bengalensis</i>	Indian Fox	Schedule-II, Part-I, Section, 1B
<i>Canis aureus</i>	Jackal	Schedule-II, Part-I, Section, 2B

(b) Birds

Zoological name	Common name	Status in Wildlife(Protection) Act
<i>Egretta alba</i>	Larger egret	Schedule-IV, Section, 11
<i>Bubulcus ibis</i>	Cattle egret	Schedule-IV, Section, 11
<i>Ardeola grayii</i>	Indian pond heron	Schedule-IV, Section, 11
<i>Milvus migrans</i>	Black kite	Schedule-IV, Section, 11
<i>Haliastur Indus</i>	Brahminy kite	Schedule-IV, Section, 11
<i>Streptopelia chinensis</i>	Spotted dove	Schedule-IV, Section, 11
<i>Alcedo atthis</i>	Small blue kingfisher	Schedule-IV, Section, 11
<i>Halcyon smyrensis</i>	White-breasted kingfisher	Schedule-IV, Section, 11
<i>Merops orientalis</i>	Small bee-eater	Schedule-IV, Section, 11

<i>Dinopium benghalensis</i>	Common wood pecker	Schedule-IV, Section,11
<i>Acridotheres tristis</i>	Common myna	Schedule-IV, Section,11
<i>Upupa epops</i>	Common hoopoe	Schedule-IV, Section,11
<i>Sturnus contra</i>	Asian pied starling	Schedule-IV, Section,11
<i>Dendrocitta vagabond</i>	Indian tree pie	Schedule-IV, Section,11
<i>Venellus indicus</i>	Red-wattled lapwing	Schedule-IV, Section,11
<i>Chardrius dubius</i>	Little ringed flower	Schedule-IV, Section,11
<i>Psittakula krameri</i>	Rose ringed parakeet	Schedule-IV, Section,11
<i>Pycnonotus cafer</i>	Red-vented bulbul	Schedule-IV, Section,11
<i>Coracias benghalensis</i>	Indian roller	Schedule-IV, Section,11
<i>Turdoides caudatus</i>	Common babbler	Schedule-IV, Section,11
<i>Centropus sinensis</i>	Crow pheasant	Schedule-IV, Section,11
<i>Dicrurus adsimilis</i>	Black Drango	Schedule-IV, Section,11
<i>Carvus macrorhynchos</i>	Jungle crow	Schedule-IV, Section,1
<i>Carvus splendens</i>	House crow	Schedule—V, Section,1
<i>Passer domesticus</i>	House sparrow	Schedule-IV, Section,11
<i>Ploceus philippinus</i>	Baya weaver	Schedule-IV, Section,11

(c) Reptiles

Zoological name	Common name	Status in Wildlife (Protection) Act
Varanus benghalensis	Indian monitor lizard	Schedule-II, Part-II
<i>Enhydrys enhydryis</i>	Smooth water snake	Schedule-IV, Section,12
<i>Natrix piscator</i>	Olive keel back snake	Schedule-IV, Section,12

(d) Amphibians

Zoological name	Common name	Status in Wildlife(Protection) Act
<i>Euphlyctis hexadactyla</i>	Common frog	Schedule-IV, section,13
<i>Bufo melanostictus</i>	Common toad	Schedule-IV, section,13

(e) Butter flies

Zoological name	Common name	Status in Wild life (Protection) Act
<i>Danaus genutia</i>	Striped tiger	Schedule-IV, Section,18
<i>Antheria mylita</i>	Moth	Schedule-IV, Section,18

Endangered Species (as per Wildlife (Protection) Act: No Endangered fauna was recorded in Buffer Zone.

Checklist of Endangered species of Buffer zone

Zoological name	Common name	Status in Wild life (Protection) Act
Not Applicable	Na	Na

Endemic Species of the Project areas: No endemic species were observed in Buffer Zone

Checklist of Endemic species of Buffer zone

Zoological name	Common name	Status in Wild life (Protection) Act
Not Applicable	Na	Na

Migratory species of the Project areas: No migratory fauna observed in Buffer Zone

Checklist of Migratory species of Buffer zone

Zoological name	Common name	Status in Wild life(Protection) Act
Not Applicable	Na	Na

Migratory corridors and Flight paths: No migratory corridors and Flight paths were observed in Buffer Zone.

Migratory corridors of Buffer zone

Name of the area	Location	Protected status
Not Applicable	Na	Na

Breeding and Spawning grounds: No breeding and spawning grounds were earmarked for the wildlife fauna in Buffer zone.

Breeding and spawning grounds of Buffer zone

Name of the area	Location	Protected status
Not Applicable	Na	Na

Aquatic Fauna:

Aquatic faunal groups are of Fin- fish (Fishes) and Shell- fish (Mollusc) and Crustaceans (Prawns) of non-commercial species.

Checklist of Aquatic Fauna of Buffer Zone

(a) Fishes:

Zoological name	Common name	Status in Wild life(Protection) Act
<i>Channa punctatus</i>	Spotted murrel	Not Applicable
<i>Clarias batrachus</i>	Magur	Not Applicable
<i>Mugil cephalous</i>	Mullet	Not Applicable
<i>Labeo rohita</i>	Rohu	Not Applicable
<i>Labeo gonious</i>	Minor carp	Not Applicable
<i>Catla catla</i>	Catla	Not Applicable

(b) Crustaceans

Zoological name	Common name	Status in Wild life(Protection) Act
<i>Macrobrachium rosenbergi</i>	Freshwater Prawn	Not Applicable
<i>Macrobrachium malcolmsoni</i>	Small Prawn	Not Applicable

(c) Mollusc

Zoological name	Common name	Status in Wild life(Protection) Act
<i>Planaxis sulcatus</i>	Ground snail	Not Applicable
<i>Littorina</i> sp.	Common snail	Not Applicable

CHAPTER – IV: ANTICIPATED ENVIRONMENTAL IMPACT & MITIGATION MEASURES

4.1 AIR QUALITY SCENARIO

4.1.1 AIR POLLUTION IMPACT ASSESSMENT

The impact assessment has been carried out dealing with the following points:

- (a) Inventory of air pollution emission sources
- (b) Impact assessment

a. Inventory of air pollution emission sources

During mining following activities may result in generation of pollutants.

- (i) Drilling : Dust
- (ii) Blasting of coal and overburden : Dust and noxious gases
- (iii) Handling of coal : Dust and noxious gases
- (iv) Overburden handling : Dust and noxious gases
- (v) Dump formation (internal) : Dust and exhaust fumes from dumpers and dust till the development of green cover
- (vi) Movement of vehicles : Dust and noxious fumes

As per the baseline data given chapter – III air quality is well within the permissible values for most of the stations. Gondegaon village has been proposed to be resettled as it falls in the core zone of the project.

The activities having impact on the ambient air quality are enumerated below:

- (i) Movement of HEMMs for physical reclamation of backfilled area
 - Dust and obnoxious fumes
- (ii) Movement of vehicles for shifting and salvaging operation of HEMMs and other equipment
 - Dust and obnoxious fumes
- (iii) Movement of vehicles for clearing of coal and other materials
 - Dust and obnoxious gases

b. Impact assessment

The mining and its related activities create ambient air pollution. The impact of mining on ambient air quality is highlighted in the following paragraphs:

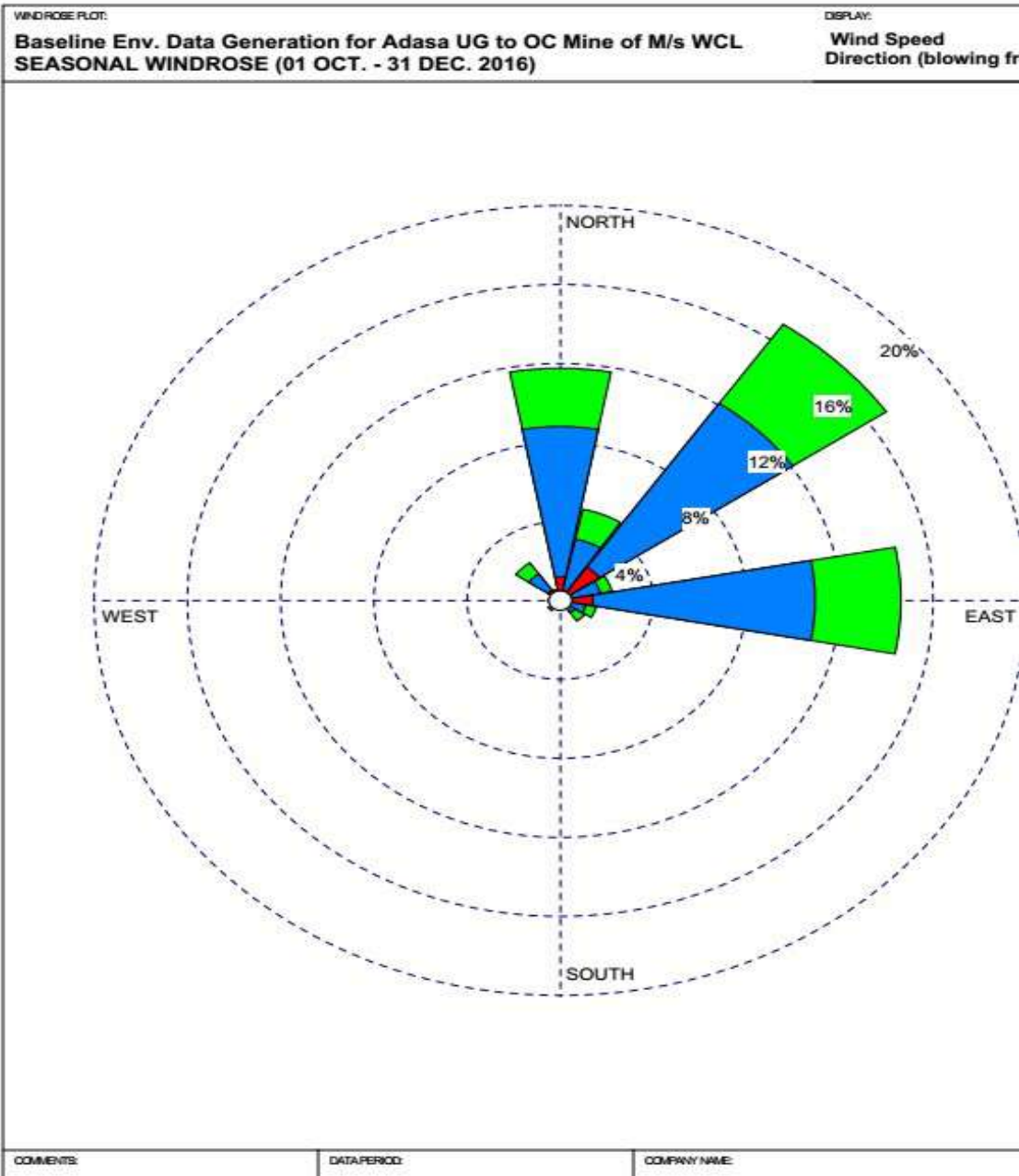
Ambient air quality is influenced due to the presence of PM₁₀, PM_{2.5}, SO₂, NO_x, etc., which are generated due to various activities like drilling, blasting and OB/Coal

handling related to the project. Further, ambient air quality is affected marginally to a varying degree due to the mining activities of other nearby opencast and underground coal mines of the same coalfield.

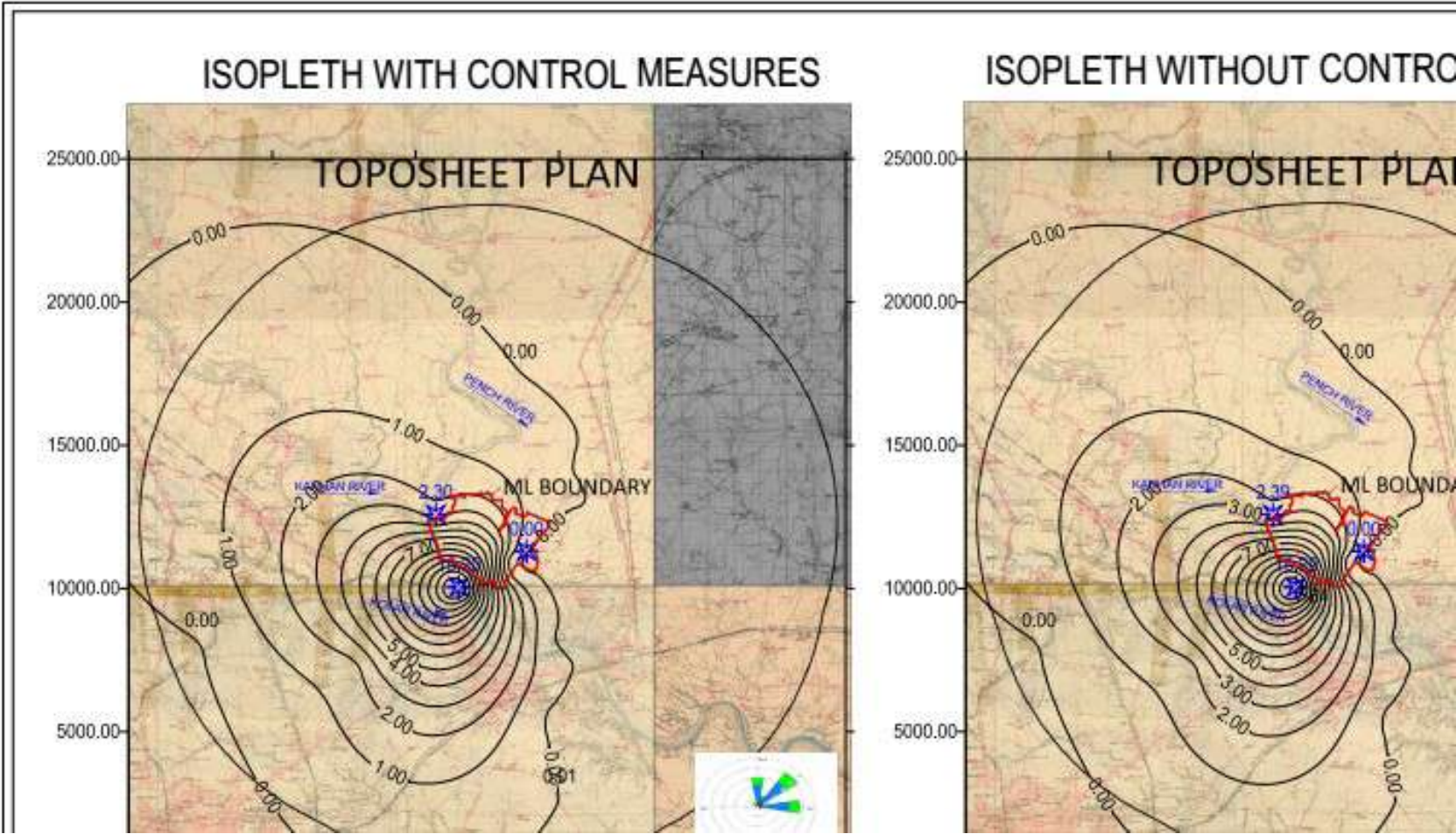
Now, with the expansion of the project, there is likelihood of addition of pollution to the existing concentration level of different attributes of ambient air. Efforts are being made by implementation of proper abatement measures so as to maintain the sinking capacity of ambient air to absorb the additional load, if any, thereby maintaining the quality of ambient air to the pre – mining level to the extent possible.

Now in order to assess the likely contribution of pollution due to expansion in production capacity by 1.00 MTPA (afore said EC for expansion from 2.5 MTPA to 3.5 MTPA), a numerical modelling has been carried out by using FDM90121 Air Quality Impact Prediction Model and is incorporated in subsequent pages. The baseline ambient meteorological data generated in the nearby Adasa UG to OC is used for the Prediction of Air Quality Data.

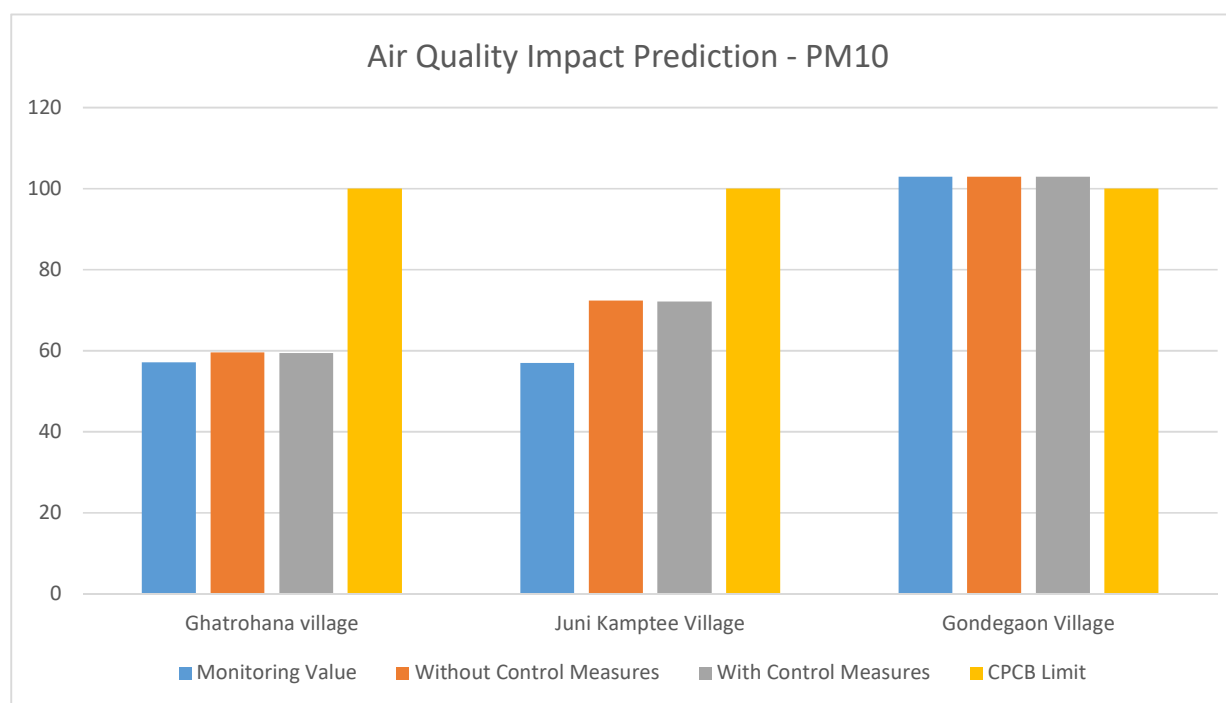
The results showing the Isopleth both for without and with Control measures have been attached herewith in subsequent pages along with a Table of the resultant air quality. It may be seen that the resultant air pollution level will remain well within the permissible limits with the suggested control measures.



GONDEGAON OC ISOPLETH - PM 10



Location	Monitoring Value	Incremental Concentration (PM 10)		Resultant Concentration		CPCB Limit
		Without Control Measures	With Control Measures	Without Control Measures	With Control Measures	
Ghatrohana Village	57.2	2.39	2.30	59.59	59.5	100
Juni Kamptee Village	57.0	15.39	15.20	72.39	72.2	100
Gondegaon Village	103	0.00	0.00	103	103	100



From the above table & graph, it can be seen that incremental value against existing dust level due to proposed enhancement in capacity will be marginal. With the control measures already in place, further augmentation and its continuous operation and maintenance, the level of dust is predicted to remain within the permissible limit value.

Validation of Prediction Modelling with Baseline monitoring :

As mentioned in the above paragraph, the predicted incremental pollution load due to expansion in production capacity from 2.50 MTPA to 3.5 MTPA is in line with the Present ground level concentration (baseline monitoring of air pollution Oct'18 to Jan'19

Location	Predicted Air pollution levels (PM10) With Control Measures($\mu\text{g}/\text{m}^3$)	Location	Ground level concentration of (PM10) (Average) ($\mu\text{g}/\text{m}^3$)
Juni Kamptee Village	72.2	Juni Kamptee Village	69
Ghatrohana Village	59.5	Gondegaon Transit Hostel (Core Zone)	62
Gondegaon Village	103	Bid bina Village	66

4.1.2 AIR POLLUTION CONTROL MEASURES

Expansion of Gondegaon Extn. OC is an Expansion Mine, the environmental monitoring data generation is being done on regular basis at four locations as per the Env (Protection) Amendment Rule published Vide Gazette of dated 25.9.2000. Based on the monitored values of air quality, following abatement measures are in place and the same will continue to be operated and maintained in order to suppress the dust and noxious gases generation during the proposed expansion to the maximum possible extent. Further, if need arises, the measures will be adequately strengthened.

4.1.2.1 DRILLING & BLASTING OPERATIONS

In order to reduce dust generated by drilling operation drills are fitted with Dust extractors. In order to minimize the generation of dust during blasting, the following measures have been and will continue to be adopted:

- a) Proper placing/spacing/positioning of blast holes.
- b) Proper design of blast considering the actual geo-mining conditions.
- c) Blasting is done between shifts or during the rest interval when the minimum number of persons is present around the blast area. In order to quickly disperse the dust generated in blasting operations, blasting is avoided when there is wind. Blasting is avoided in the mornings and during cloudy situations.
- d) Adaptation of Controlled Blasting Technique as permitted by DGMS, wherever required.

4.1.2.2 COAL HANDLING PLANT, LOADING & TRANSPORT

The crusher house has been covered with green fibreglass corrugated sheet which has resulted in significant reduction of dust during crushing. The loosened overburden material as well as coal, as far as possible is being and will continue to be wetted first with help of water spray arrangements before the start of loading operations.

Movement of vehicles and HEMM on haul roads, particularly when they are not metalled, is another major source of dust generation. To minimize dust generation due to this operation, the following abatement measures are in place & will continue to be maintained & operated. Some of the existing measures are further enumerated along with exhibits.

- In order to achieve the minimum dust generation, all Coal Carrying trucks are being properly covered by Tarpaulin to minimize the fugitive dust emission (arising due to coal spillage) and trucks are being monitored through CCTV cameras & GPS system for the compliance.



Figure 3 Transportation truck covered with tarpaulin

- To minimize the dust generation during coal transportation the roads has been black topped along with a 3-tier bamboo plantation. Total length of the internal black topped road is around 2.8 Km (Black topped road 8.6 km & concrete Road is 0.80 km).



Figure 4 showing Black topped road (length 8.6 Km)

- Three nos. of mobile water tankers having a capacity of the 28 KL, 12 KL & 8 KL are deployed for the water spraying to achieve the effective dust suppression on coal transportation roads, haul road & near coal stock yard.



Figure 5 showing water spraying on coal transportation road for dust suppression

- 10 nos. of the fixed sprinklers are installed over the conveyor belt, hopper, weighbridge, coal stockyard and along the coal transportation road.



Figure 6 Fixed sprinkler at coal stock yard



Figure 7 Fixed water sprinkler

- To minimize the air pollution control both of the CHP are fully covered by side cladding



Figure 8 Side Cladding at CHP

- Manual Road Sweeping is done in routine along the road side for maintaining Cleaning & sweeping at the project and also a sweeping machine of around 46 lakh rupees from Eicher has also been deployed for the routine sweeping and cleaning of Coal transportation Road.



Figure 9 Showing Automatic sweeping machine

- All the operating vehicles are certified by PUC to control pollution



Figure 10 PUC Certificate

- To reduce air pollution in colony area, all the workers have been facilitated with LPG cylinders by management. No Coal is issued to workers for domestic purpose.

All the above-mentioned control measures will be continued during the entire life of the project.

1.1.2.3 PLANTATIONS

Plantation has been undertaken in the mine area as mitigation measure against air pollution, noise pollution and to increase the aesthetic value. The job of plantation is taken up from the revenue budget of the mine.

The plantation is developed at suitable places like overburden dump, along the road sides, unused land etc to arrest as well as reduce the rate of dispersion of dust generated due to various mining operations viz. quarrying, coal and OB transportation, OB dumping, CHP operation. The details of plantation carried out in the ML area is given as below:-

A total of 3,93,905 nos. (128.20 Ha) of the saplings having species of Neem, Karanja, Gulmohar, Teak, Sisoo & bamboo etc. have been planted at vacant places, OB dumps, near CHP, in between Gondegaon village and inactive OB dump, along coal transportation road and also in the Gondegaon project residential colony.

Breakup of the plantation has been given below.

Table 16 Site wise plantation data – Gondegaon OC

Sl no.	Plantation Site	Area Planted	Species planted	No of Plants	Year of plantation	Plantation to be maintained 3/5 years	Survival	Agency
1	On Embankment , Near CHP, substation	8.80	Neem, Teak, Sisoo, Karanj, Rain Tree, Jamun, Avanla, Cssia, Imli, Shivan, Subabul, Gulmohar, Peltaphoroum etc	40,000	1996-97	3 Years	As per company Policy	Pvt. Party
2	Road to Project Office	3.50		16,000	1997-98	3 Years		FDCM Nagpur
3	Colony Road	16.30		73,500	1998-99	3 Years		FDCM Nagpur
4	Colony Road	4.10		18,500	1999-00	3 Years		FDCM Nagpur
5	Colony Road near OB dump	2.00		5,000	2001-02	3 Years		FDCM Nagpur
6	Between OB dump and Village	27.20		68,000	2002-03	3 Years		FDCM Nagpur
7	Near OB dump along CHP	20.00		50,000	2003-04	3 Years		MPRVVN
8	Colony	12.00		30,000	2004-05	3 Years		FDCM Nagpur
9	Near Village and WCL colony	20.00		52,000	2005-06	3 Years		MPRVVN
10	Coal Transportation Road	4.00		9,805	2010-11	2 Years		FDCM Nagpur
11	Rehabilitation Site			1,100	2012-13	3 Years		Pvt. Party
12	OB dump	10.3		30,000	2016-17	5 Years	95 %	MPRVVN
Total		128.20		393,905				



Figure 11 Showing Plantation

4.2 WATER QUALITY

4.2.1 IMPACT ASSESSMENT ON WATER

Identification of the sources of water pollution

Likely sources of water pollution from this project along with the type of pollutants are as follows:

1)	Sanitary (domestic) wastewater	Suspended solids and BOD
2)	Industrial waste water from workshop	Suspended solids, oil & grease;
3)	Wastewater from mine	Suspended solids of coal, clay and oil;
4)	Surface run-off passing through coal stockpiles	Suspended solids
5)	Storm water from leasehold area and built-up area	Suspended solids

Gondegaon Extn. OC coal mine expn. project is an Expansion Mine, the environmental monitoring data generation is being done on regular basis at four locations as per the Env (Protection) Amendment Rule published Vide Gazette of dated 25.9.2000.

EFFLUENT WATER QUALITY MONITORING DATA

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
06/07/2017	8.80	44	34	<2
29/07/2017	8.68	28	22	<2
04/08/2017	8.71	44	34	<2
30/08/2017	6.75	40	30	<2
05/09/2017	8.40	24	14	<2
27/09/2017	8.62	28	18	<2
Standards 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
06/07/2017	8.36	32	26	<2
29/07/2017	8.29	32	28	<2
04/08/2017	8.30	32	28	<2
30/08/2017	7.52	36	28	<2
05/09/2017	8.55	28	16	<2
27/09/2017	8.51	32	24	<2
Standards as per Env.(Protection) Amendment rule 2000	5.5 - 9.0	250	100	10

DRINKING WATER QUALITY MONITORING DATA

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	Unobjectionable	Unobjectionable	Unobjectionable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	8.17	6.5 to 8.5	No relaxation

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result	Standard (IS : 10500 : 2012)	
					Desirable limit	PLV in the absence of alternate source
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	240	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	0.54	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	65.6	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	8.125	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988 Nessler's	0.5	11.48	45	No relaxation
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	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	0.03	<0.03	0.1	0.2

As it can be observed from the regular monitoring data that existing values are within limits.

The impact of mining at the project on surface water sources has been assessed and given below and impact of mining at the project on ground water sources has been dealt separately at para 4.2.3:

Deterioration of water quality and pollution of water bodies is possible due to discharge of mine effluent, if not treated. Change in relief pattern due to mining may

cause flooding, siltation, choking and pollution. Mitigation measures involve provision of

- (ii) Garland drains on periphery to prevent surface run-off from entering into the quarry,
- (iii) Catch drain around the dumps for avoiding siltation and
- (iii) Sedimentation ponds for reducing the pollution of surface water bodies.

Possible overflow of water from nearby rivers/ Nallahs are safeguarded by stone pitching and strengthening of the embankment along the side of the water course. In order to assess the existing quality of mine pumped out water from Expansion of Gondegaon Extn OC, water samples have been collected & analysed, which has been discussed in previous paragraphs. From the analysis it can be concluded that effluent from existing mine does not contain pollution load so as to affect natural water quality adversely. The proposed expansion in production capacity is proposed within the existing mine limit as such no adverse impact on water quality is anticipated.

4.2.2 WATER POLLUTION CONTROL MEASURES

i) Industrial Effluent & Mine water

ETP having a capacity of 100 KLD with oil skimmer has been installed near the washing ramp of the workshop where the discharged water is being properly treated for having a zero discharged system. The ETP sludge is being treated properly at CHWTDfs, Buttibori before final disposal.

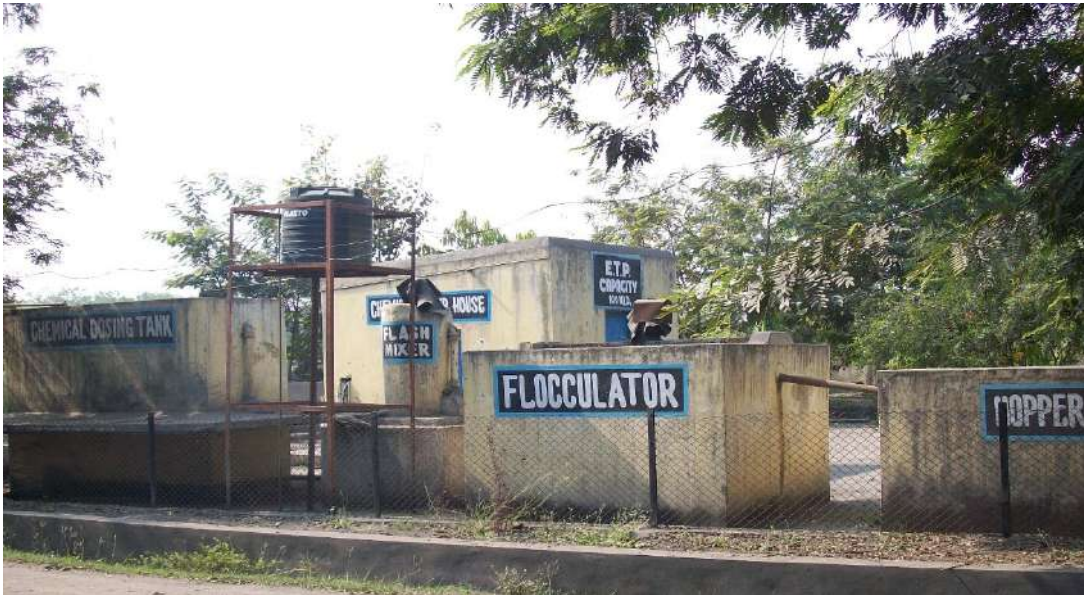


Figure 12 Workshop ETP of 100 KLD



Figure 13 Workshop ETP of 100 KLD

All parameter of ETP waste discharge is being monitored regularly as per Env. (Protection) Amendment Rule, 2000 and the same shall be done for expansion project.

ii) Mine Water

First, the raw mine discharged water is collected in a Central quarry, which function like a sump, where the coal particles (if any), are being settled down and then after

the water is pumped out for further treatment through sedimentation ponds before discharging to the Kanhan river.



Figure 14 A general view of the Central quarry



Figure 15 Sedimentation Tank

Two nos. of the sedimentation ponds (One sedimentation pond with baffles wall having size of 58*18*1.5 metres.) & one Kattcha Sedimentation pond having almost double size of the previous one respectively has been constructed for primary filtration / sedimentation of the mine discharged water.

The existing and the proposed arrangement of mine water treatment is sufficient to take care of the needs of expansion projects, however if need arises these arrangements will be strengthened.

iii) Surface Run-off

Adequate numbers of vegetation will be grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it also reduces surface run-off, which helps averting siltation of Natural watercourses.

For the existing project, to arrest the silt, Catch drains of size 1100 m X 3.5m X 1.8m and 400m X 3.3m X 2.00m (Length X Breadth x Depth) have been constructed around the OB dumps. The same is regularly de-silted and maintained properly. Garland drains are also provided around the quarry of size 3100m X 4.75m X 2.25m and 450m X 5.00m X 1.60m (Length X Breadth x Depth).

Catch drains are provided around the OB dumps to collect the run off & silt during peak rainfall. In OB benches, cross drains are provided which collect all silt & run off to the mine sump having sufficient capacity to deal with peak rainfall. These mine pumps provide sufficient settling time for suspended particles. As expansion project shall commence, the Garland drain/catch drain shall be extended suitably.

iv) Domestic Water Treatment

The residential colony of the project is having an arrangement of the clusters of septic tanks & soak pits and are functioning very well. An estimate for construction of STP is under process & tendering will be done shortly and the same will take care of the needs of expansion project. Regular water quality/effluent quality monitoring is carried out and will continue to be carried out so as to ascertain the likely load of pollutants and thereby suitably modifying the control measures.

4.2.3 IMPACT ASSESSMENT & MEASURES FOR AUGMENTATION OF GROUNDWATER

G. RADIUS OF MINE INFLUENCE AREA

In the opencast mines, the different aquifers overlying the working coal seam would be contributing ground water to the mine by gravity drainage since they are exposed/removed at the mine. The anticipated average groundwater inflow to the mine is to the tune of 19960 m³/day at the final quarry depth of 176 m & 145 respectively. As such due to this pumping, cone of depression would be formed of which shape and extent of the cone would depend on mainly hydraulic conductivity and specific yield of aquifers, mine depth & area etc.

Generally steep drawdown cone would be formed in poor potential aquifers thereby the influence area is to small distance and reverse is established in respect of aquifers with high hydraulic conductivity. The radius of mine influence area has been estimated for Gondegaon Extn. OC Expn. based on the above mentioned aquifer

and mine parameters and works out to about 1000 m at final mine depth of 176 m. The radius of influence will be prominent mainly in down dip side of the mine.

It may be appropriate to mention here that the presence of prominent boundaries/water bodies, faults and also interfingering of sandstone and shale beds may restrict the propagation of drawdown cone. As such, the anticipated mine induced effect would be confined to the area north and east of Kanhan/Pench river which is a major river controlling master drainage of the area.

H. IMPACT OF MINING ON WATER REGIME

The mining activity creates dis-equilibrium in environmental scenario of the area and disturbs the groundwater conditions/regime in particular. The impact on water regime due to mining activity can be broadly classified as under:

- i) Impact on topography & soil
- ii) Impact on surface water and quality
- iii) Impact on groundwater & quality

A brief description/out-line on these aspects is given below:

a) IMPACT ON TOPOGRAPHY AND SOIL

A local change in ground topography will be created at Gondegaon Extn. OC Expn. area due to mining operations such as open pit, embankments, dumps of overburden and coal. As a result, there would be marginal change in the drainage and surface run-off. During these courses, soil is more susceptible for changes due to erosion, leaching phenomena/process etc. Further the fine dust particles of coal & overburden may adversely affect the porosity of soils. The external dumps will result in silting on soils and local drains thereby marginal change in topography and drainage of the area.

Within the core zone area, cracks and loosening of soil would be resulted due to mining and associated activities such as drilling, blasting etc thereby physical/textural changes would occur in soil/formations. This mine-induced process increases the rate of infiltration and recharge. So also the backfilled area may be a good media for high groundwater recharge due to high-induced permeability. Further, the void proposed to be left out would store substantial quantity of rain water which can be utilized for domestic & agriculture use and also for recharging the

groundwater_source. These mine-induced effects may change the surface run-off in the core zone area resulting in a difference in hydrological regime of local drains.

It may be appropriate to highlight the fact that temporary groundwater loss/deficit created during active mining stage would be compensated by these different means in the post mining stage so that the initial groundwater levels are regained to normalcy at the earliest for the utility of the area.

b) IMPACT ON SURFACE WATER AND ITS QUALITY

As mentioned earlier, there would be minor change in the ground topography and infiltration capacity/rate of soil/formation due to mining operations resulting in some local change in drainage pattern and surface run-off in core zone. It is established that high infiltration zone would serve as good media for high groundwater recharge and reduces the surface run-off considerably in the core zone. In view of this, the mine has to handle more water in the monsoon besides the additional contribution from the surface run-off from the catchment area. As such the surface run-off contribution to the natural drains from the mining area would be reduced / minimum thereby some minor change is expected in hydrologic regime of the river system.

c) IMPACT ON GROUND WATER AND ITS QUALITY

Mining is associated with groundwater problems, particularly when it is below water table. The impact of mining on groundwater is dependent mainly on mine and aquifer parameters, groundwater recharge-discharge process etc. In opencast mining, the unconfined aquifer gets affected more whereas the semi-confined aquifers are least affected due to continuous gravity drainage and conventional sump pumping or advance dewatering schemes for efficient and safe working. As such, during this exercise, basically the water level is to be depressed/depleted below the working seam depth in which case large scale mine water pumping cannot be avoided. Consequently the mine dewatering would drain out some area around the mine with decline in groundwater levels. However, these mine-induced effects are temporary. Further, the mine pumped out water would contaminate the other resources of water. The water quality monitoring is being carried out at the stipulated intervals as preventive measures.

Groundwater inflow and mine influence area have been estimated and the groundwater monitoring have been undertaken as corrective measure to avoid adverse effects. The mine discharge after passing through sedimentation pond / tank is discharged onto land/natural drains with earthen check dam at suitable locations so that the groundwater gets additional recharge by the return flow. The artificial recharge by water conservation structures in mine influence area proper may not be a viable solution because of the reason that recharged water would drain to the mine at a faster rate due to the steep hydraulic gradients resulted in during mining activity. As mentioned earlier, the mine impact may be for temporary period during mine life and the area would regain the normalcy/benefits in many ways by appropriate reclamation measures during post-mining period. However, the water shortage in the mine influence area would be supplemented from the treated mine water discharge for both domestic & irrigation use of affected villages if any.

I. AUGMENTATION OF GROUNDWATER RECHARGE POTENTIAL

As a part of environmental protection, the project has been adopting all possible measures to increase the ground water recharge potential in the influenced and nearby areas.

AFFORESTATION AND PLANTATIONS

To improve the environment and greenery in the area, WCL takes up plantation on a larger scale in the coal mining area. Physical reclamation is the first stage of reclamation in which geometrical shapes of the dumps are made suitable for biological reclamation and make it stable and safe. Biological reclamation involves growing of grasses and trees that can check the soil erosion from the dump. The improvement in vegetation cover has a direct bearing on augmentation of ground water recharge.

Rain Water Harvesting & Artificial Recharge:

Coal mining is the major industrial activity in the area. Ground water pumping is an integral part of coal mining. Besides this, groundwater utilization is mainly for domestic and irrigation use in the study area.

To minimize the impact of mining on ground water system, the project/mine authority has been adopting all possible measure to increase the ground water recharge potential.

The stage of ground water development in the buffer zone (10 km from the periphery of the core zone) of Gondagaon Extn. OC Expn. comes to about 46.69%.

During water scarcity, the shortage in nearby villages is supplemented and addition to this new ponds has been dug by project authority(s) in Yeshamba village of size 20m X 12.75m X 1.50 m & behind Durga Mandir, Gondagaon Colony of size 12.00m .x 4.5m x 2.25 m. This structure also acts as an artificial recharge.

However, artificial recharge may be done for more use of ground water for irrigation augmentation in the study area when the source of water is easily available for recharging.

The artificial recharge by water conservation structures in the outside mine influence areas will check water level lowering. But within the mine influence area it may not be a viable solution because of the reason that recharged water would drain into the mine at a faster rate due to the steep hydraulic gradients resulted in the mining activity.

However, additional artificial recharge will be taken up for improving the quality of ground water.

The impact on ground water level is being minimized by artificial recharge by spreading of pumped out water, creation and filling of ponds with mine water and construction of rainwater harvesting structure.

In the monsoon season, the garland drain channels the surface run-off from the different mines area without any contamination and is accumulated in mine sump and being utilized for different purposes.

Roof-top rainwater Harvesting will be taken up in the project area using the administrative buildings. Rainwater Harvesting and artificial recharge will also take place through abandoned dug-wells and final voids of old mines for increasing ground water potential and check water level lowering.

After mine closure, void of opencast and underground workings will be waterlogged. This will help in maintaining the water table in the surrounding areas and may become a source of water supply to the community.

Creation of awareness among workers and local peoples about rain water Harvesting and artificial recharge will be given priority. This aspect is usually covered during the Environmental Week celebrated every year (5th to 12th June).

Efforts are being made to construct more recharge structures (i.e. ponds/tanks) at suitable sites in the nearby affected villages.

4.3 NOISE QUALITY

4.3.1 NOISE LEVEL IMPACT ASSESSMENT

Proposed expansion mine would be associated with following activities that may generate noise during operation:

- a. Drilling
- b. Blasting
- c. Shovel operation
- d. Dozing
- e. Movement of dumper
- f. Operation of CHP / Workshop

The following are some of the important activities responsible for high noise level generation, with their expected noise levels:

All mining activities i.e. drilling, blasting, loading, dozing and dumping are associated with high noise level [about 100 dB (A)].

Operation of most HEMMs produce high noise level. The noise level are in range of 80 – 100 dB (A). Noise level have been found to be related to engine capacity. Crusher – General noise level due to crusher ranges from 90 dB (A) – 105 dB (A). Some of noisy equipment produce noise whose level is around 120 dB (A).

The average sound pressure level of some of the HEMM associated with mining operation which are responsible for high noise level generation are as follows:

EQUIPMENT	NOISE LEVEL [dB(A)]
Dozer	98
Dumper	92
Power shovel	93
Drilling machine	96

ACCEPTABLE INDUSTRIAL NOISE LEVEL

As per Env. (Protection) Amendment Rules, 2000 the ambient air quality standards in respect of noise in industrial, commercial, residential and silence zones area as follows:

Sl. No.	Category of area	Limits [dB(A)]	
		Day time (6.00 AM to 10.00 PM)	Night time (10.00 PM to 6.00 AM)
1.	Industrial	75	70
2.	Commercial	65	55
3.	Residential	55	45
4.	Silence zone	50	40

Assessment of the degree of noise to which a workplace noise is harmful, is done by comparing the values measured at workplace to the permissible limit adopted by statutory bodies like DGMS.

The Director General of Mines Safety vide their circular no. DG (Tech.)/18 of 1975 has prescribed the permissible limit for noise level as 90 dB(A), for the workers engaged in mining occupation likely to be exposed to in an 8 hour shift period with unprotected ear. Whereas, the following table shows the maximum permissible noise exposure levels, as per American Standards, for the industrial workers.

Exposure time (Hrs./day)	Noise level [dB(A)]
8	90
6	92

4	95
3	97
2	100
1.5	102
1	105
0.5	108
0.25 or less	115
EXPOSURE TO PULSE OR IMPACT NOISE SHOULD NOT EXCEED 140 dB(A)	

With the proposed enhancement of the Gondagaon extension opencast coal mine expansion project (amalgamated Gondagaon Ghatrohana OC mine), increase in the expected noise level in the mine activity area may be insignificant as no addition of infrastructure is envisaged.

4.3.2 NOISE POLLUTION CONTROL MEASURES

Monitoring of the noise control will be carried out on regular basis as per the Env (Protection) Amendment Rule 2000. While planning for an effective noise attenuation measures, the concept of source, path and receiver has been considered.

(A) Noise Control at Source

There are two means where the noise generation can be checked at source.

(i) Proper Design

Since the generation of noise can be reduced by reducing the vibration amplitude, the area of vibrating part and frequency of vibration will be taken care that all loose contact between metal parts avoided.

Shock absorbing pads will be fixed in the foundation of vibrating equipment / machines. In case of aerodynamic noise producing sources, mufflers will be provided with the machines.

(ii) Proper Maintenance

All machines and equipment will be properly maintained. Sound muffler system and bearing lubricating system etc. of equipment will be kept in proper condition.

Noise control in Transmission Path

The measures are to be taken for control of noise along the transmission path have been put in following two categories:

- (i) Air borne path
- (ii) Ground borne path

(i) Air Borne Path

The control in air – borne path has been planned in a number of ways as:

- (a) The crusher house, screen house etc., which are source of high level noise generation are to be enclosed.
- (b) Planting of furrows of trees along the thick foliage around the compound and wall of CHP, workshop and other industrial buildings. This will reduce the spread of noise. It can be also used as an acoustic enclosure to reduce ambient noise.

(ii) Ground Borne Path

It has been proposed to provide vibration isolators in the form of vibration absorbing pads placed at the base of vibrating equipment.

(C) Noise Control at Receiver End

Even after adopting above measures, if desired noise level is not achieved at receiver end, in that case, following measures are suggested:

- (a) The workers exposed to high noise level are provided with earplugs.
- (b) Provision of enclosed booths at the worksite to protect worker from noisy environment.

Control of Ground Vibration

The adverse impacts due to ground vibration occurs because of blasting operations carried out in the mine. In the proposed Gondagaon Expn OC Expansion blasting will be carried out as per the provisions of the Statute and only after taking due permission from Directorate General of Mines Safety (DGMS). The blasting pattern including spacing of holes, burden, charge per blast / delay etc. is strictly followed in the mine during actual mining operations. The blasting will be carried out under the direct supervision of a Blasting Officer and records of every blast will be monitored and maintained. In case of blasting near the habitation, separate blasting pattern will be designed and tested so as to avoid/ minimize any adverse impact of blasting/ ground vibration on the nearby structures. The approval for such type of Controlled blasting will be obtained from DGMS and will be implemented accordingly.

4.4 LAND MANAGEMENT

4.4.1 DURING MINING LAND USE PATTERN

The total land involved in existing Gondegaon OC is 845.74 ha. The present proposal of expansion envisages only increase in production capacity from 2.50 MTPA to 3.50 MTPA.

Table 17 Pre-mining land use details

Sl.No.	Particulars	Land(ha)
1)	Tenancy land	792.08
2)	Government land	53.66
3)	Forest land	NIL
	Total	845.74

Table 18 Land use of the project area during Mining

Sl. No.	Description	leasehold Area (Ha)
1	Quarry Area	277.13
2	Embankment Area	13.05
3	External OB dump	323.98
4	Infrastructure	50.00
5	Project Township	13.00
6	Rehabilitation Site	21.66
7	Area needed for rationalization and blasting zone	146.92
	Total	845.74

Table 19 Stage-wise Land use and Reclamation Area (ha)

S. N.	Land use category	Present (1st year)	5 th year	8 th year	3 years after end of mine life
1	Backfilled Area with (Reclaimed plantation)	0	20	79	79
		0	0	0	40
2	Excavated Area (Not reclaimed)/void	146.98	166.98	198.13	198.13
3	External OB dump	67.98	167.98	323.98	323.98

	(Reclaimed with plantation)	12	25	40	40
4	Top soil dump ((Reclaimed with plantation)	2.06	10.06	15.06	0
		0	0	0	0
6	Undisturbed area under (brought plantation)	535.26	383.01	131.86	146.92
		96	100	120	130
7	Roads (avenue plantation)	5.74	5.74	5.74	5.74
		1.00	1.00	1.00	1.00
8	Area around buildings and Infrastructures	57.26	57.26	57.26	57.26
		24.20	24.20	24.20	24.20
9	Embankment	8.80	13.05	13.05	13.05
		8.00	8.00	8.00	8.00
10	Rehabilitation	21.66	21.66	21.66	21.66
		12.44	12.44	12.44	12.44
	Total	845.74	845.74	845.74	845.74
	(Plantation)	153.64	170.64	205.64	255.64

Table 20 Stage-wise Cumulative Plantation

year	External Dump		Backfilled area		Others (undisturbed area/etc.)		Total	
	Area (ha)	No. of trees	Area (ha)	No. of trees	Area (ha)	No. of trees	Area (ha)	No. of trees
1 st year	12.00	30.00	0.00	0.00	141.64	354.10	153.64	384.10
5 th year	25.00	62.50	0.00	0.00	145.64	364.10	170.64	426.60
8 th year	40.00	100.00	0.00	0.00	165.64	414.10	205.64	514.10
3 years after end of mining	40.00	100.00	40.00	100.00	175.64	439.10	255.64	639.10

(Area figures are in ha, Plantation in Nos thousands)

Table 21 Post-mining Land use pattern of ML/Project Area (ha)

S.N.	Land use during mining	Land use (ha)				
		Plantation	Water Body	Public use	Undisturbed	Total
1	External OB Dump	40.00	0.00	0.00	0.00	323.98
2	Excavation	40.00	237.13	0.00	0.00	277.13
3	Roads	1.00	0.00	4.74	0.00	5.74
4	Built up area	44.64	0.00	47.33	0.00	91.97
5	Undisturbed Area	130.00	0	0	16.92	146.92
	Total	255.64	237.13	52.07	16.92	845.74

4.5 SOLID WASTE MANAGEMENT

One external OB dump has been proposed in the north side of the quarry as shown in quarry & Surface Layout plan. The individual dump benches would be of 10m height and final angle of overall slope of OB dump would be about 28°. Maximum height of proposed external dump is planned as 60m. However, as per DGMS stipulation the dump height can be increased from 60 m to 90 m only after the obtaining the proper safety measures and maintain safe slope angle.

Sl.No.	Year	Coal Prod. MT.	Over Burden Removal in Mm ³		
			HOE	Dept.(considering as on date capacity)	Total
1	2015-16	2.13 (Act.)	0.42	3.84	4.26
2	2016-17	2.15 (Act.)	0.76	4.35	5.11
3	2017-18	2.8	6.82	4.8	11.62
4	2018-19	3.0	7.65	4.8	12.45
5	2019-20	3.2	8.48	4.8	12.28
6	2020-21	3.4	9.31	4.8	14.11
7	2021-22	3.5	10.90	4.8	15.70
8	2022-23	3.5	10.90	4.8	15.70
9	2023- 24	3.5	9.70	4.8	14.5
10	2024 – 25	2.05	9.78	4.8	14.58
	Total	29.23	74.72	46.59	121.31

Calendar programme of OB excavation for the balance life has been given in the previous paragraph. Total overburden of the quarry as on 1/4/2015 is 121.31 Mm³. This will be accommodated in the external and internal dumps as detailed below:-

Table 22 Dump Quantities

Sl. No.	DUMPS	OB DUMP QUANTITIES (Mm ³)				
		0-20 m	0-30 m	30-60 m	60-90 m	Total
A	External Dump					
A.1	Top Soil Dump					
A	Dump D-4	1.90				1.90
B	Dump A-3	3.80				3.80
	Sub Total (A.1)	5.70	0.00	0.00	0.00	5.70
A.2	OB DUMP Excluding Top Soil)					
A	Gondegaon Dump D-1		3.91	4.94		8.85
B	Gondegaon Dump D-2 & D-3		4.07			4.07
C	Ghatrohan Dump A-2		28.38	20.68	13.33	62.39
	Sub Total (A.2)		36.36	36.36	13.33	75.31

	Total External Dumping (A)	5.70	36.36	25.62	13.33	81.01
B	Internal Dumping Quantity					40.30
	Total OB Quantity (A+B)					121.31
	Percentage of Backfilling					33.22%

VOLUME REGIME

The entire Gondegaon-Ghatrohan OC has been divided into four cuts namely; Cut (A+B) in Gondegaon quarry and Cut-C, D & E in Ghatrohan quarry. The mineable reserves, OB and stripping ratio in these cuts are given in the following table:-

Cut No.	Description of Cuts	Deptt./ Hiring	Coal (Mt)	OB (Mm ³)	S.R. (m ³ /t)
A+B	Up to dip-side limit of Gondegaon quarry				
	Eastern side of Section E-10	Deptt.	4.26	13.97	
	Western side of Section E-10	Hiring	6.21	28.76	
	Sub-Total (Cut-A+B)		10.47	42.73	4.08
C	Up to 210 FRL in Ghatrohan quarry				
	From Top to roof of III-Top	Hiring	4.50	26.62	
	From III-Top to bottom Seam	Deptt.	2.79	7.35	
	Sub-Total (Cut-C)		7.29	33.97	4.66
D	Up to up-thrown fault F1-F1' in Ghatrohan quarry				
	From Top to roof of III-Top	Hiring	3.81	20.21	
	From III-Top to bottom Seam	Deptt.	3.63	8.67	
	Sub-Total (Cut-D)		7.44	28.88	3.88
E	Up to dip-side limit in Ghatrohan quarry				
	From Top to roof of IV-Bottom	Hiring	1.08	11.58	
	From IV-Bottom to bottom Seam	Deptt.	2.95	4.15	
	Sub-Total (Cut-E)		4.03	15.73	3.91
Total		Deptt.	13.63	34.14	
		Hiring	15.60	87.17	
		Total	29.23	121.31	4.15

DUMPING SCHEDULE

Total overburden of the quarry as on 1/4/2015 is 121.31 Mm³. This will be accommodated in the external and internal dumps. As per the Annual Plan of 2015-16, 7.98 Mm³ OB will be excavated which will be dumped in external Dump- D1 (3.91 Mm³) and Dump- D2 & D3 (4.07 Mm³). Out of total 121.31 Mm³ OB, 40.30 Mm³ OB will be accommodated in internal dumping and rest 81.01 Mm³ will be dumped externally. The year-wise dumping schedule is tabulated below:

Table 23 Dumping Schedule

Yr	Quarry	Total OB (Mm ³)	Top OB (Mm ³)			Parting OB (Mm ³)	Dumping Programme				
			Top Soil	Bal Top OB	Total Top OB		Top Soil Dump A-3, D-4	Dump A-2, D-1, D-2 & D-3			Internal Dumping
								0- 20m	0- 30m	30-60 m	
1	Gondegaon	7.98	0.00	4.75	4.75	3.23	0.00	7.98	0.00	0.00	0.00
2	Gondegaon	9.18	0.80	3.95	4.75	4.43	0.80	8.38	0.00	0.00	0.00
	Ghatrohan	2.83	0.75	0.10	0.85	1.98	0.75	2.08	0.00	0.00	0.00
	Sub-Total	12.01	1.55	4.05	5.60	6.41	1.55	10.46	0.00	0.00	0.00
3	Gondegaon	7.98	0.80	3.81	4.61	3.37	0.80	7.18	0.00	0.00	0.00
	Ghatrohan	2.33	0.37	0.48	0.85	1.48	0.37	1.96	0.00	0.00	0.00
	Sub-Total	10.31	1.17	4.29	5.46	4.85	1.17	9.14	0.00	0.00	0.00
4	Gondegaon	7.97	0.80	2.12	2.92	5.05	0.80	4.05	2.21	0.00	0.91
	Ghatrohan	2.33	0.18	0.67	0.85	1.48	0.18	1.48	0.67	0.00	0.00
	Sub-Total	10.30	0.98	2.79	3.77	6.53	0.98	5.53	2.88	0.00	0.91
5	Gondegaon	7.70	0.00	0.00	0.00	7.70	0.00	3.25	0.00	0.00	4.45
	Ghatrohan	2.56	0.00	0.83	0.83	1.73	0.00	0.00	2.56	0.00	0.00
	Sub-Total	10.26	0.00	0.83	0.83	9.43	0.00	3.25	2.56	0.00	4.45
6	Gondegaon	1.92	0.00	0.00	0.00	1.92	0.00	0.00	0.00	0.00	1.92
	Ghatrohan	9.23	0.00	0.00	0.00	9.23	0.00	0.00	9.23	0.00	0.00
	Sub-Total	11.15	0.00	0.00	0.00	11.15	0.00	0.00	9.23	0.00	1.92
7	Ghatrohan	11.65	0.00	0.00	0.00	11.65	0.00	0.00	10.95	0.70	0.00
8	Ghatrohan	10.29	1.50	0.75	2.25	8.04	1.50	0.00	0.00	4.10	4.69

Yr	Quarry	Total OB (Mm ³)	Top OB (Mm ³)			Parting OB (Mm ³)	Dumping Programme				
			Top Soil	Bal Top OB	Total Top OB		Top Soil Dump A-3, D-4	Dump A-2, D-1, D-2 & D-3			Internal Dumping
								0- 20m	0- 30m	30-60 m	
9	Ghatrohan	9.70	0.50	1.50	2.00	7.70	0.50	0.00	0.00	1.50	7.70
10	Ghatrohan	9.70	0.00	3.03	3.03	6.67	0.00	0.00	0.00	3.03	6.67
11	Ghatrohan	9.75	0.00	4.00	4.00	5.75	0.00	0.00	0.00	4.00	5.75
12	Ghatrohan	8.21	0.00	0.00	0.00	8.21	0.00	0.00	0.00	0.00	8.21
TOTAL		121.31	5.70	25.99	31.69	89.62	5.70	36.36	25.62	13.33	40.30

4.6 BIO-DIVERSITY ISSUES

There is no endangered and endemic species in core and buffer zone. The reclaimed and afforested external dump and backfilled area covering 255.64 ha will be made into a habitat for the fauna. This composite habitat for fauna based upon prey predator relationships, after complete reclamation will support populations of insect, bird species, small herbivores and other predatory species dependent upon species, in the food chain.

4.7 SOCIAL ASPECTS

Mining operation affects the families and landowners in the mine area directly and the project affected persons & families are given adequate compensation as per Company's norms.

4.7.1 REHABILITATION & RESETTLEMENT

The details of R&R activities carried out for the existing project is as follows:-

R & R of the Gondegaon Village is in progress after constituting a committee for proper execution of the National R & R Policy on the Sub Area and Area level, Nagpur Area. The land compensation paid is Rs.11,52,10,812.00 INR only. All required amenities has been provided at rehab site. Some villagers have already shifted to new Gondegaon rehabilitation site & construction of their new houses is under progress details has been given below.

1. As per the EC village Gondegaon has to be rehabilitate at a new site i.e. New Gondegaon that comes into Kandri Patwari Halka .The status of progress as on 20.11.2017 is as below:
2. Existing village Gondegaon was in 8.04 Ha (Total Land Holding Area)
3. New Gondegaon Village or rehabilitated Site is in 21.66 Ha (Total Land Holding Area)
4. Total nos of house Holders-721
5. Already Shifted to new rehab site-350
6. Employment provided-13 land losers
7. Monetary Compensation-14 Land losers
8. All basic amenities as per town planning deptt of Maharashtra State has been completed.
9. Primary Health Centre.
10. Primary School, Water Pump house.
11. Gram Panchayat Office.
12. WBM Road.
13. Overhead tank of capacity 2 lakh litres around.
14. Two working bore well for drinking water.
15. Almost 150 houses are under construction.
16. 1100 nos of Plantation.
17. 2 nos. Cattle shed.
18. Bank Building and post office building are under construction.

RECENT DEVELOPMENT AT THE R & R SITE (NEW GONDEGAON VILLAGE



Figure 16 Gram Panchayat Office:



Figure 17 Construction of Entry gate at new Gondegaon Village



Figure 18 Construction of School Building



Figure 19 Construction of Bus Stoppage



Figure 20 Construction of overhead water storage tank (capacity 2 Lakh litres)



Figure 21 Construction 2 nos. of Cattle sheds



Figure 22 Construction of Public Health Centre



Figure 23 Construction of Aanganwadi



Figure 24 Electrification of the village



Figure 25 Construction of WBM Road



Figure 26 Construction of Post office & Bank Building under construction

4.7.2 WATER FOR SOCIETY

Out of total quantity of mine pumped out water of 32688 M³/D, within the mine for various purposes about 5000 M³/D is used. The balance quantity is being planned for uses by local/ neighbouring community under the following heads through implementation of schemes / MOU.

- Installation of RO plant for drinking water - 100 M³/D
- Installation of pressure filter plant for drinking water - 630 M³/D
- Water to be provided to Vidarbha irrigation development corporation through MOU - 26958 M³/D

4.8 MINE CLOSURE ACTIVITIES

Mine closure planning has to be carried out at the starting of the mine and needs periodic reviewing and revision during its life cycle to cope with the geo-technical constraints, safety and economic risks, social & environmental challenges. For Mine Closure activities, a corpus fund is created by opening an escrow account with the coal controller organization in nationalised bank. For opencast mine, an amount @ Rs 6.00 lakhs per Ha of the project area and for underground mine, an amount @ Rs 1.00 lakhs per Ha of the project area is required to be deposited in this account for final mine closure. Progressive mine closure is done with the fund provided in approved report. The above rate has been adopted as per Circular No. 55011-01-2009-CPAM, GOI, Ministry of Coal, dated 27 August 2009.

Existing Mine Closure Corpus

The existing Mine Closure Cost was assessed for 12 years life and ML area of 845.74 ha considering production from 2015-16 with a mine target of 2.50 Mty. The total mine closure fund for Amalgamated Gondagaon Ghatrohan OC deposited in the Escrow A/c till date is as follows:

Year	Mine Closure Amount Deposited in Escrow A/c
2013-14	Rs 14.8284 crs
2014-15	Rs 5.9528 crs
2015-16	Rs 2.5502 crs
2016-17	Rs 4.3733 crs
2017-18	Rs 5.0458 crs
Total	Rs 32..7506 crs

Revised Mine Closure Corpus

As This proposal is for enhancement of mine capacity from 2.50 Mty to 3.50 Mty. Accordingly, the Revised Mine Corpus for Gondagaon Extension Opencast Coal Mine Expansion project (Amalgamated Gondagaon Ghatrohan OC mine) has been prepared in October, 2017 based on the approved Mining Plan of Gondagaon Extension Opencast Coal Mine Expansion project (Amalgamated Gondagaon Ghatrohan OC mine) prepared by WCL for enhance target capacity of 3.50 Mty and life of 10 years (balance life of 7 years as on 01.04.2018). The calculation of Mine Closure Cost is tabulated below:

Sl.No.	Details	Qty
1	WPI for All Commodities for Aug 2009 (Old Series)	129.6
2	WPI for All Commodities for Sept, 2017 (Provisional) (New Series)	114.3
3	WPI for All Commodities for Sept, 2017 (Provisional) (Converted to Old series, conversion factor = 1.561)	178.4223
4	Ratio of WPI = (3) / (1)	1.3767153
5	Total land area requirement for the project excluding 21.66 ha land required for rehabilitation Colony (ha) =	824.08

6	Mine closure cost @ Rs 6 lacs/ha (Rs in Lakhs) =	4944.48
7	Mine closure cost after indexing from August, 2009 to September, 2017 (Rs. In Lakhs) = (6) x (4) =	6807.14
8	Total Mine Closure Amount deposited in Escrow A/c upto 2016-17 (Rs. In Lakhs)	2770.47
9	Total Mine Closure Corpus after adjusting the amount deposited in Escrow A/c (Rs. In Lakhs) = (7) – (8) =	4036.67
10	Balance Life of the mine as on 01.04.2017	8
11.	Annual Contribution to Escrow fund for 2017-18 (Rs in Lakhs) = (9) / (10) =	504.58

The year-wise Mine Closure Cost with 5% escalation in subsequent years is tabulated below:

YEAR-WISE MINE CLOSURE COST

Year	Annual Production (Mty)	Corpus Fund (Rs. in Lakhs)	Mine Closure Cost (Rs /t)
A) Closure Cost already deposited			
A.1	AS PER EARLIER APPROVED PR (EC – 2.50 MTY)		
	2013-14	1.820	1482.84
	2014-15	1.860	595.28
	Total	3.68	2078.12
A.2	AS PER PROPOSED MINING PLAN (3.50 MTY)		
1	2015-16	2.130	255.02
2	2016-17	2.150	437.33
	Sub-Total (A.2)	4.28	692.35
B) Closure Cost To Be Deposited as Per Mining Plan for 3.50 Mty			
3	2017-18	2.80	504.58
4	2018-19	3.00	529.81
5	2019-20	3.20	556.30
6	2020-21	3.40	584.12
7	2021-22	3.50	613.32
8	2022-23	3.50	643.99

Year		Annual Production (Mty)	Corpus Fund (Rs. in Lakhs)	Mine Closure Cost (Rs /t)
9	2023-24	3.50	676.19	19.32
10	2024-25	2.05	710.00	34.64
Sub- Total (Year-3 to 10)		24.95	4818.33	19.31
TOTAL (1 to 10)		29.23	5510.68	
Total (1 to 10)		32.91	7588.80	23.06

BREAK-UP OF CLOSURE FUND FOR VARIOUS CLOSURE ACTIVITIES

- 1) Mining is to be carried out in a phased manner initiating afforestation / reclamation work in the mined out area of first phase while commencing mining in the 2nd phase.
- 2) Upto 80% of the total deposited amount including interest accrued in the ECSROW account may be released after every 5 years. The amount released should be equal to expenditure incurred on Progressive Mine closure in past 5 years or 80% whichever is less.
- 3) The above cost / expenditure will be met from the corpus fund deposited in the escrow account by the mine operator. However, the additional amount beyond the escrow account will be provided by the mine operator after estimating the final mine closure cost (as per the mine closure guideline).
- 4) The amount indicated separately under each head in the table below is indicative only and based on actual expenditure the amount may change.

Table 24 Activity wise Break-up of Closure Cost

Sl. No.	Activity	% of Total Mine Closur e Cost	Amount (Rs in Lakhs)	Remarks
A	Dismantling of structures			To be included in final mine closure
	Service Building	0.2	15.18	
	Residential Building	2.67	202.62	

Sl. No.	Activity	% of Total Mine Closure Cost	Amount (Rs in Lakhs)	Remarks
	Industrial Structures like, Workshop, Field substation, etc.	0.3	22.77	plan.
B	Permanent Fencing of mine void and other dangerous area			To be included in final mine closure plan.
	Random rubble masonry of height 1.2 meter including levelling up in cement concrete 1:6:12 in mud mortar	1.5	113.83	
C	Grading of high wall slopes			To be included in final mine closure plan.
	Levelling and grading of high wall slopes	1.77	134.23	
D	OB Dump Reclamation			
	Handling/Dozing of OB Dump into mine void and preparation of Internal dump for reclamation.	88.66	6728.29	71% for progressive and 17.66% for final mine closure.
	Technical and Bio-reclamation including plantation and post care.	0.4	30.36	Equal Weightage through-out the life of the mine.
E	Landscaping			
	Landscaping of the open space in leasehold area for improving its aesthetic and eco value.	0.3	22.77	Equal Weightage through-out the life of the mine.
F	Plantation			
	Plantation over cleared area obtained after dismantling.	0.5	37.95	To be included in final mine closure plan.

Sl. No.	Activity	% of Total Mine Closure Cost	Amount (Rs in Lakhs)	Remarks
	Plantation around the quarry area and in safety zone.	0.2	15.18	Equal Weightage through-out the life of the mine.
	Plantation over the external OB Dump	0.02	1.52	Equal Weightage through-out the life of the mine.
G	Post Closure Env Monitoring/Testing of Parameters for three years.			For three years after mine closure
	Air Quality	0.22	16.70	
	Water Quality	0.2	15.18	
H	Entrepreneurship development (vocational/ skill development) Training for sustainable income of affected people.	0.26	19.73	Equal Weightage through-out the life of the mine.
I	Miscellaneous and other mitigative measures.	2	151.78	Equal Weightage through-out the life of the mine.
J	Post Closure Man power cost for supervision	0.8	60.71	To be included in final mine closure plan.
TOTAL		100%	7588.80	

4.9 OCCUPATIONAL HEALTH ISSUES

WCL has full-fledged medical set up in all areas to check up and monitor all the Occupational diseases endangering the health of its precious workforce. The periodical medical Examination for all workmen is compulsory as per Statute. It is carried out once in every five years for each and every worker and proper records are maintained and submitted to Directorate General of Mines Safety as it is a

statutory requirement. In Nagpur Area, under whose administrative control, the mine under consideration is being worked is no exception. All the statutory obligations under the Occupational health are strictly followed.

Present set up of Occupational Health Services at WCL:

WCL is having Occupational health committee at the corporate (HQ) level as well as at the unit (Area /Project level).

At corporate level, the committee consists of the following: -

- General Manager (Safety)
- Chief of Medical Services
- Periodical Medical Examination (PME) Incharge of HQ.

The committee scrutinizes the report of the area every quarter.

At Unit level, the committee consists of the following: -

- General Manager (Operations)
- Area Medical Officer
- Area Safety Officer
- Periodical Medical Examination (PME) In-charge of Area.

The above committee takes the review at area level every month.

In Nagpur area there is a full-fledged secondary level 50 bedded hospital “Jawaharlal Nehru Hospital, Kamptee” with the facility of emergency care and casualty services for 24 hours along with the routine OPD. The hospital is equipped with 06 doctors 12 staff nurses, 2 lab technicians, 2 X-Ray Technician and other paramedical staff to run hospital services. To cater industry based demand as per regulations, there is well developed PME & IME units in the hospital.

PME IME UNIT

Infrastructures

The PME & IME unit of the hospital is located in the main building of the OPD block. There is a well-ventilated hall outside to it. The PME IME hall cum room facilitates the service of 1

1. Registration
2. Height / Weight Measurement
3. Audiometry
4. Spirometry (Lung Function test)

5. Screening for eye refraction
6. Online PME entry
7. Data entry point along with record keeping

Equipment / machines

1. 12 Lead ECG machine
2. Semi Auto Analyser for blood test
3. Microscope
4. Audiometer
5. Spirometer
6. 500 mA X Ray machine
7. Standard 3 Plate view box
8. ILO films

IME and PME of Gondegaon OCM for contractual and departmental worker:-

Year	IME	PME
2015	157	220
2016	128	170
2017	194	181

CHAPTER- V: ANALYSIS OF ALTERNATIVES

Proposed project is an existing project coal mining project which is a site specific activity, thus question of alternative does not arise.

CHAPTER- VI: ENVIRONMENTAL MONITORING PROGRAMME

6.1 ENVIRONMENTAL MONITORING

The environmental monitoring programme will be carried out as per details given below: -

S N	Items	Parameters	Frequency	No. of Stations
1	Ambient Air Quality Monitoring	TPM, PM ₁₀ , PM _{2.5} SO ₂ , NO _x , CO & Fugitive dust	Every Fortnight as per EPA, Rule 2000	4
2	Water Quality Monitoring	1) 4 Parameters viz. p H, Total Suspended Solids (TSS), Chemical Oxygen Demand (COD) & Oil and Grease. 2) 35 Parameters	Every Fortnight Once in a Year	2
3	Noise Quality Monitoring	Noise Levels	Every Fortnight	2
4	Environmental Statement		Annual	
5	Ground Water Level Monitoring & Quality	Water Level & Quality Parameters.	Water Level – Quarterly. Water Quality – Yearly.	In Buffer Zone Villages.
6	Compliance Report of EC Conditions	All conditions both Specific & General	1 st June & 1 st December	Not Applicable

6.2 MONITORING ORGANISATION

To have a close watch on the environmental condition and implementation of the various measures suggested, a multi-disciplinary approach is essential for formation of Environment Management Cell / Department.

WCL, has an Environment Deptt. headed by General Manager (Env.) at its HQs. The department provides necessary support that are required for environmental management of various mining projects under the jurisdiction of the company.

- (a) At area level Area General Manager of the area co- ordinates the activities of various disciplines in the area to render all necessary assistance at the implementing level i.e. the Project level.

- (b) Nodal Officer (Environment) of the area monitors all aspects of environment on behalf of the Chief General Manager. He will also take suitable steps for generation of environmental data along with CMPDI team for its analysis and interpretations.
- (c) The work of plantation will be implemented through State Forest Deptt.
- (d) At project level, Sub Area Manager shall primarily is responsible for land resource management. He is responsible for biological reclamation as per directives of GM (Env.), WCL (HQ).

6.3 FUNCTIONS OF THE ENVIRONMENT MANAGEMENT CELL / DEPARTMENT

- To integrate environmental factors into business decisions.
- To prepare time bound action plan for implementation of various provisions of Environment Management Plan, maintain a record of it and submit six monthly report to MPCB.
- To monitor in compliance with environmental regulations.
- Continual improvement in environmental performance.
- To follow proper documentation and monitoring procedures, for developing better environmental management systems at the mine.
- To ensure systematic and routine housekeeping to reduce generation of pollution inside the mine.
- To develop and maintain green belt in and around the mine.
- To keep up with regulatory requirements and arrange for the necessary certificates or consents viz. air and water.
- To submit environmental statement to MPCB within stipulated time.

6.4 EC COMPLIANCE REPORT

In compliance of the O.M dated 30.05.12, inspection by RO, MoEF&CC, Nagpur completed on 03.01.2019. The certificate has been issued vide F. No. EC-766/2018-NGP/4810 dt 21.01.2019 and the same is enclosed at Annexure VII.

CHAPTER- VII: ADDITIONAL STUDIES

7.1 INTRODUCTION

Mining is a hazardous industry. There is risk to life and property associated with various mining and allied activities of the project. As such a detailed study has been carried out covering identification and assessment of risk, and recommendation of measures to prevent damage to life and property against such risks. They are discussed below.

7.2 PUBLIC CONSULTATION

The environmental clearance had been accorded by MOEF vide its letter no. Environment clearance of 2.5 MTY coal production has been granted vide ref no ref.J-11015/106/2009-IA-II (M) dt.15.07.09) for (1.50 to 2.50 MTPA) within ML area of 917.00 ha based on public hearing conducted on 26.04.2005 at the site. Environmental clearance has been granted with validity of one year for production capacity 3.5 MTPA within EC area 917.00 ha vide J-11015/106/2009-IA.II(M) dated 14/03/2018 with exemption of public hearing. Subsequently an application for extension of validity of EC under EIA notification, 2006 was submitted to MoEF & CC and discussed in the 34th EAC meeting held on 24-07-2018.

EAC directed for issuance of Public Notice in leading news papers for inviting comments/ suggestion from stakeholders regarding coal mine operations. Accordingly, notice was published and after expiry of notice period, no comments were received. It is enclosed as Annexure – VIII along with latest status of Public Hearing compliance status.

7.3 DISASTER MANAGEMENT PLAN

The project report/ mining plan has been drawn in conformity with the prevailing statutory provisions applicable for safety in Opencast Mines. However following matters related to safety during opencast operations have to be given special considerations.

7.3.1 PRECAUTIONS AGAINST SURFACE WATER

Ghatrohan Sub-quarry is at 100 m distance from Kanhan River and a part of quarry falls below HFL. The HFL of Gondegaon & Ghatrohan Opencast block is 279.035 m

recorded on 7th Sept. 1994 by Inder Colliery Survey Office. Since there is a danger of flood water from Kanhan river to proposed quarry, a flood protection embankment has been proposed. The proposed embankment is 30m wide at the top and of height 6m above HFL. As per prevailing practice, proposed embankment has to be constructed by spreading the suitable soil i.e. fine grained soil for Hearting zone and coarse grained soil for casing zone in continuous layers and compacted by mechanical means i.e. by rollers to standard optimum dry density at optimum moisture content. Also it has been proposed to provide 300 mm thick boulders pitching on water side of embankment up to HFL. However for portion of embankment where the surface level is higher than the HFL, no pitching has been envisaged.

However before adoption of this section it is suggested that the proposed embankment section may be got approved by competent authority like Maharashtra Irrigation department of Govt. of Maharashtra and DGMS for its structural safety and stability. The alignment of the proposed embankment is shown in Quarry Layout Plan. It is also suggested to determine withdrawal level/Danger mark, so that as water level crosses the limit, workings shall be stopped.

Suitable alarms connected to float in Kanhan River, would be provided at strategic places like Time Keeper Office, Security Office, Safety Office, Manager Residence, Pit Office etc. The floats in the river would activate the alarms as soon as the water level in the river crosses the danger mark. Suitable action can then be taken to investigate the alarm and take other suitable precautions. In addition, river side patrolling would also be carried out during monsoon to caution the project authority in case of any sudden rise in the river. Adequate wireless communication sets have been provided for the above purpose. The rain water falling within the project area would be diverted from the quarry area by providing garland drains and shall be collected towards low lying area.

7.3.2 FIRE & SPONTANEOUS HEATING

Wild or herbaceous plants shall be removed from the mine. No person shall deposit heated material or ashes on any opencast working. Also no person shall light a fire or permit a fire to be lighted in any OC working except by the permission in writing of the Manager and only for a special purpose specified therein. No coal shall be left exposed in coal benches more than its incubation period to avoid fire in seam

due to spontaneous heating. Proper type of the extinguisher to be kept in each HEMM ready for use in case of emergency. One Fire Fighting Truck has been provided. In coal stock, coal shall be dispatched on the basis of first in first out.

7.3.3 SLOPE STABILITY

It is suggested that following action may be taken to deal with slope stability problem.

- a. Vulnerable area may be identified and marked on quarry plan.
- b. Observation of actual alignment of fault, its throw, joints, etc. may be recorded during the process of exploitation.
- c. Water drainage system may be properly implemented to prevent accumulation of water in cracks. Also dumps shall be levelled to prevent accumulation of water over it. Proper drainage in dumps shall be also provided to prevent erosion of toe of dump. A provision of Rs 50.00 lacs have been kept for dump monitoring equipment so as to effectively monitor dumps on a regular basis.
- d. Regular monitoring of tension cracks, horizontal and vertical movement of strata in critical area may be done.
- e. Rise side slope to be reinforced if required because it has to stand throughout quarry life. No dumps/surface structures to be located within 15m of quarry edge as it will act as surcharge there by destabilizing the slope.
- f. No undercutting of slopes to be done.
- g. Proper hydrogeological studies to be done if water table is at level of slope it should be brought down by using submersible pumps to prevent hydrostatic pressure.
- h. Proper selection of site for dumping to be done and place shall be made free from loose material. Dumping shall not be done at an angle more than angle of repose of material being dumped.
- i. After completion of dumping operations, dumps to be stabilized by growing vegetation.
- j. Every person deployed by leaser of HEMM must be trained & briefed about aspects related to slope stability.

7.3.4 HAUL ROAD MAINTENANCE

Adequate care must be taken for proper construction and maintenance of haul road

as per the existing guidelines. The gradient of haul road should not be steeper than 1 in 16.

7.3.5 BLASTING OPERATIONS

As explosives are required in bulk for blasting in OC mines, provision of CMR should be ensured. All blasting operations shall be carried out in day light. Suitable precautions shall be taken as per statute before and after blasting operations. Controlled blasting technique has to be practiced to minimise fly off rocks and ground vibrations and keep them within safe limits. In order to keep the ground vibrations within the permissible limit as per DGMS Circular No. 7 of 1997, to avoid flying of rock fragments and also to achieve satisfactory blasting results, optimized drilling / blasting parameters depending upon rock formation using combination of relays / delays will have to be evolved. It is further recommended that at the time of actual execution, proper study for controlled blasting and ground vibration is done with scientific body in order to evolve site specific charge distance relationship.

7.3.6 SCIENTIFIC STUDIES

Following areas have been identified in the proposed mine for detailed scientific studies:

a) Slope Stability

It is proposed to carry out scientific study on slope stability of external and internal OB dumps as well as for final slope of quarry batter. Based on the findings of scientific research the proposed slope of dumps and batter may change.

b) Drilling & Blasting

For optimum fragmentation of rock and coal to minimize the overall cost of excavation, it is proposed to engage some scientific body to carry out research for optimum drilling and blasting. Accordingly, the powder factor suggested after this study will be followed in the proposed mine.

c) Hydrogeology

Proper provision has been made for scientific study to assess the hydrogeological parameters of the proposed area.

In addition to this, various other parameters like, soil testing, etc. need scientific study. A capital provision of Rs. 30.00 Lacs has been kept for the above scientific studies.

CHAPTER – VIII: PROJECT BENEFITS

8.1 PROJECT BENEFITS

The benefits of the project can be summarized as below:-

- The physical infrastructure in the area has already been improved substantially by following ways:-

Development of road thereby improving the communication.

Improvement in Power, Telephone (including Mobile) facility.

Improvement in Health Care facility & Educational facility.

Improvement in Market / Trade & Business.

- The social infrastructure by way of cultural mixing of people of other states with local community glorifying “UNITY IN DIVERSITY”.

- Substantial employment in the project & indirect employment for business & trading, contractor, transportation, vehicle contractor, nursery development.

WCL as a responsible corporate organization in Central India is playing a significant role in developing the region around its mines in the States of Madhya Pradesh & Maharashtra.

WCL takes up various infrastructural development works in the surrounding area covering the felt needs of the local community and the various works undertaken by WCL in Nagpur area have been given hereunder.

Table 25 CSR work undertaken at Gondegaon village

STATUS/EXPENDITURE STATEMENT OF CSRWORKS FOR THE YEAR 2010-11 (In Lakhs)				
INFRASTRUCTURE				
1	2010-11	Warada Village	Repair of balance approach road from Yashamba to Warada Village under GSA. (Spill Over 2009-10)	1.45

2	2010-11	Ghat Rohna village	Construction of cement concrete road from Juni Kamptee to Ghat Rohna Village under GSA.	11.71
3	2010-11	Tekadi village	Repairing of approach road from Tekadi Village upto NH-7 under GSA.	71.00
SOCIAL EMPOWERMENT				
6	2010-11		Bicycle Distribution (111 Nos.) to different villages of Nagpur Area.	3.40
7	2010-11		Distribution of Sewing Machine 15 nos. to different villages of Nagpur Area.	0.58
8	2010-11		Blanket Distribution 250 nos. to different villages of Nagpur Area.	0.26
9	2010-11	Gondegaon Village	Distribution of Plastic sheet to flood affected villagers Gondegaon.	0.15
WATER SUPPLY				
10	2010-11	Gondegaon	Servicing of water supply pump, Gondegaon.	0.10
			INFRASTRUCTURE	
11	2010-11	Kamptee/ Gondegaon SA	Distribution of uniform set to the poor students of ZP School near Kamptee/Gondegaon SA.	0.49
STATUS OF CORPORATE SOCIAL RESPONSIBILITIES TAKEN UP IN 2011-12				
INFRASTRUCTURE				
12	2011-12	Yesamba village	Providing concrete pavement at Main road at Yesamba village, Tah: Parseoni(200MX3.7M)	14.87
EDUCATION				

13	2011-12	Ghatrohna Village	Construction of one room at Ghatrohna School (6mX4m) of Gondegaon.	2.77
STATUS OF CORPORATE SOCIAL RESPONSIBILITIES TAKEN UP IN 2012-13				
INFRASTRUCTURE				
14	2012-13	Rohna village	Construction of cement concrete road at Rohna Village under GSA.	2.7
15	2012-13	Ghat rohna to Juni Kamptee	Making balance concrete pavement from Ghatrohna to Juni Kamptee (300 Mtrs.)	11.07
16	2012-13	Yesamba village	Providing cement concrete ghat with drain near river bank at Yesamba village. (80m.)	10.16
17	2012-13	Ghatrohna Village	Repair and carpeting of road from Gondegaon project turning to Ghatrohna village (3750mx3.3m.)	50.5
18	2012-13	Warada Village	Construction of cement concrete road (400mx3m) at village Warada near Gondegaon.	15.81
STATUS OF CORPORATE SOCIAL RESPONSIBILITIES TAKEN UP IN 2013-14				
INFRASTRUCTURE				
19	2013-14	Yesamba village/ Wagholi village	Repairing of damaged Tar road from village Yesamba to Village Wagholi under Gondegaon SA.(Approx. Length 3.00 Km)	41.43
20	2013-14	Parseoni Tehsil	Sponsoring of promotional activity of tribal community and culture residing in and around Parseoni Tehsil under CSR activity.	2.00
EXPENDITURE INCURRED IN 2014-15				
21	2014-15	Warada village	Providing financial assistance to farmer of Warada village under GSA.	8.08

22	2014-15	Gondegaon & Tekadi village	Assistance to farmers of Gondegaon village and Tekadi village under CSR.	8.19
EXPENDITURE INCURRED IN 2015-16				
23	2015-16		Jalyukta Shivar Abhiyan under CSR.	24.00
EXPENDITURE INCURRED IN 2016-17				
24	2016-17	Kamptee	Widening and strengthening of existing road from kamptee road junction to Bina Villages	100.97
25	2016-17	Nagpur	Consultation fee of Drawing and designing towards Zero Mile Development	2.00
26	2016-17	Kanhan Pipri Village.	Misc. works like Chain link, fencing Shed, pumps etc. for K2K project at Kanhan Pipri Village.	7.44
27	2016-17	Brahmni, Kalmeshwar	Construction of Libriary and Study Centre Building for Gram Panchayat Brahmni, Kalmeshwar Tahsil	21.79
28	2016-17	Nilgaon & Parsodi	Reuse and supply of Mine Water for drinking water purpose in Nilgaon and Parsodi villages of Nagpur Dist.	23.13
29	2016-17	Bina village	Stregthning of existing 650 Mtrs.WBM Length road From Bina village to Bina Sangam	30.18
EXPENDITURE INCURRED IN 2017-18				
30	2017-18	Kanhan	Providing Printer / Sound System to Adarsh School Kanhan	0.28
31	2017-18	Kanhan	Supply of Books for Library at Dharmnagar under Nagar Parishad Kanhan Pipri	1.06
32	2017-18	Kanhan	Supply of LED projector to Adarsh High School, suresh Nagar Nagpur	0.24
33	2017-18	Nilgaon	Construction of WBM road from Nilgaon to Dhapewada, Tehsil saoner , Nagpur Area	66.00

34	2017-18	Bina village	Strengthening of existing 650 Mtrs.WBM Length road From Bina village to Bina Sangam	0.74
35	2017-18	Nagpur	Provision for Swachhata pakwada	1.66

Some of the CSR works with photographs at Gondegaon Ext. OC coal mine expn. Project of Nagpur area, WCL



Figure 27 Repairing of the approach road from Yeshamba to Warada village. (Length 400*3m)



Figure 28 Construction of the cement concrete road from Juni Kamptee to Ghatrohna village



Figure 29 Construction of room for Anganwadi at Ghatrohna village



Figure 30 Repairing of damaged tar road from village Yesambha to Wagholi (length appr.3000 m).



Figure 31 Construction of concrete payment at main road at Yesamba village. (Length 200 m*3.7 m)



Figure 32 Construction of one computer room at Porwal College Kamptee



Figure 33 Construction of room at Porwal College Kamptee



Figure 34 Construction of two rooms at Vikas Prathamik Shala at Kanhan

CHAPTER – IX ENVIRONMENTAL COST – BENEFIT ANALYSIS

This is an expansion project and proposed for extension of validity of EC granted by MoEF & CC vide its letter dated 14-03-2018. The EIA/EMP studies have been carried out in compliance of directives of 34th EAC held on 24-07-2018. Hence, “Cost Benefit” Analysis has not been carried out.

CHAPTER – X: ENVIRONMENT MANAGEMENT PLAN

10.1 GENERAL

Close monitoring of the environment and implementation of various protective measures discussed in the report forms an important part of EMP. In the earlier chapters the causes of various pollutions along with the preventive and mitigating measures have been discussed. In this chapter description of the administrative aspects of ensuring that mitigation measures are implemented and their effectiveness monitored, after approval of the EIA is being discussed.

10.2 MONITORING ORGANISATION

To have a close watch on the environmental condition and implementation of the various measures suggested, a multi-disciplinary approach is essential.

(a) WCL headquarters acts as an apex body which supervises the activities relating to environment at project level through the General Manager.

(b) Area General Manager of the area coordinates the activities of various disciplines in the area to render all necessary assistance at the implementing level i.e. the Project. Area Nodal Officer (Environment) monitors all aspects of environment on behalf of the General Manager. He also takes suitable steps for generation of environment data along with its analysis and interpretations.

Plantation will have to be done on a large area. Therefore, it may be desired that an outside agency may have to be employed for this purpose.

(c) Sub Area Manager is responsible for mechanical reclamation of the area. He is also responsible for biological reclamation with the assistance of AGM's office.

ORGANISATION FOR ENVIRONMENT MANAGEMENT

SN	Measures/Actions		Agency
1.	Environmental Control	1	Area General Manager, Nagpur Area
		2	Nodal Officer, (Environment), Nagpur Area
		3	Sub Area Manager, Gondegaon OC.
		4	Staff Officer (Civil), Nagpur Area
		5	Environmental Cell (WCL H.Q.)

2.	Environmental Monitoring	1	Area General Manager, Nagpur Area
		2	Staff Officer (Civil), Nagpur Area
		3	Nodal Officer (Environment), Nagpur Area
		4	Sub Area Manager Gondagaon OC
		5	Environment Cell of WCL Headquarters
		6	Environmental Laboratory of CMPDI, RI-IV
3.	Reclamation	1	Sub Area Manager Gondagaon OC
		2	Nodal Officer (Environment), Nagpur Area

10.3 ENVIRONMENTAL COST

A capital provision of Rs. 147.09 lakhs has been made against environment protection and details are as provided.

Table 26 Environmental Cost

Sl. No.	Particulars	Capital (Amount in Rs. Lakhs)
1	Sedimentation pond for treatment of mine waste water	15.37
2	Effluent treatment plant for treatment of workshop effluent	10.25
3	Base line Env. data generation(as per new guidelines) and scientific studies related to environment	11.24
4	Installation of fixed type sprinklers for dust control (including water reservoir, pump, pipeline etc.) and other suitable dust suppression systems.	35.87
5	Plantation during First three year	15.37
6	Digital Mapping for land use plan	8.99
7	Domestic Effluent Treatment Plant for 340 Quarters	50.00
	TOTAL	147.09

Environmental Expenditure during last three financial years.

1. Plantation expenditure

Sl. No	Year	Amount (in Lakh)
1	2015-16	NIL
2	2016-17	18.00
3	2017-18	NIL
4	2018-19	NIL

2. Other expenditure

Sl. No	Year	Capital	Revenue	Amount (in Lakh)
1.	2014-15	NIL	34,89,858.00	34,89,858.00
2.	2015-16	36.06	34,31,019.00	3431055.06

3.	2016-17	NIL	30,75,848.00	30,75,848.00
4.	2017-18	NIL	5,00,660.00	5,00,660.00
5.	2018-19	NIL	40,79,000.00	40,79,000.00

CHAPTER – XI: SUMMARY AND CONCLUSION

11.0 Introduction

The Environment Clearance of Gondegaon Extn. OC coal mine Expn. project for 2.50 MTPA rated capacity in a lease area of 917.00 ha, was obtained, (vide no – J- 11015/106/2009-IA II (M) dated 15th July, 2009).

Further, the mining plan including mine closure plan for increase in production capacity from 2.5 MTPA to 3.5 MTPA in an ML area of 845.74 ha (within the existing EC area of 917.00 ha has been approved by WCL board in its 293rd meeting held on 31.10.2017 as communicated vide letter WCL/BD/SECTT/BM-293/2017/935 dt 10.11.2017. Project does not involve any forest land.

Subsequently, EC of Expansion of Gondegaon Extn. OC coal mine with increase in production capacity from 2.5 MTPA to 3.5 MTPA in a total area of 917.00 ha (mine lease area of 845.74 ha) with a validity of 1 year was obtained vide no. J- 11015/106/2009-IA II (M) dated 14th March, 2018.

Subsequently, an application consisting of compliance of specific conditions was submitted to MoEF & CC through online portal vide dated 27-06-2018 for amendment in validity of EC i.e. for extension for validity for EC and the project was appraised in 34th EAC meeting held on 24-07-2018. The EAC directed us to submit additional information in respect of the project.

Quote:

34.9.6 The EAC, after detailed deliberations and for the present, desired for additional information in respect of the following:-

- (i) EIA studies to be carried out with one season baseline data, and the Environment Management Plan to be prepared accordingly,
- (ii) Redressal of issues raised during the last public hearing conducted by the SPCB on 26th April, 2005, along with the R&R details, if any, duly certified by the State Government,

(iii) Public notice to be issued in leading newspapers (one national and two local) for information of the stakeholders about commencement of the project and present coal mining operations of capacity 2.50 MTPA in mine lease area of 917 ha, inviting comments and their redressal,

(iv) Compliance status of the conditions stipulated in the environmental clearance dated 14th March, 2018 from the Regional Office at Nagpur,

(v) Details of court cases and the compliance status,

Unquote

As per the directions of 34th EAC committee, one season baseline data (12 weeks) has been generated and based on which this EMP is prepared. The compliance of other observations has been dealt separately

11.1.1 Location & Communication

The area under consideration lies between latitudes E22o6' – E22o 16' and longitudes N79o11' - N79o 12'. The area is covered by Survey of India Toposheet No.55 O/3. Ghatrohan block is located North-West of existing Gondegaon Opencast mine. Amalgamated Gondegaon-Ghatrohan OC Mine is in Nagpur district of Maharashtra and is under administrative control of Nagpur Area of Western Coalfields Limited. This report envisages extension of Gondegaon OC by amalgamation of the existing Gondegaon OC mine with adjoining Ghatrohan OC block.

The quarriable area is bounded by State high way No.233 in North, Kanhan river in West and South and incrop of Seam-I in East. The quarriable area is separated by the barrier from Inder UG to OC project.

11.1.2 Topography & Drainage:

The proposed quarriable area is bounded by State high way No.233 in North, Kanhan River in West and South and in crop of seam-I in East. The surface area is generally undulating with elevations ranging from 278 m to 288 m above MSL. The main drainage is controlled by Southerly flowing

Kanhan River along the Western and Southern boundaries of the block. Minor seasonal streams originating within the block drain into Kanhan River. In general, the area is sloping towards South West and South.

11.1.3 Climate & Rainfall

The climate of the district can be classified as tropical hot climate with high range of temperature through out of year. Primarily there are two prominent seasons in the district - the very hot summer and moderate winter. The summer months are very hot and prolonged while winter is short and mild. The monsoon season starts immediately after summer till late September. The southwest monsoon bring lot of rainfall during rainy season.

11.2 Geomining Parameters

The Geo-Mining Parameters of the Expansion of Gondegaon Extension OC are as follows;

(Details are as on 01.04.2018)

Table 27 Geo-Mining Parameters

Sl no	Particulars	
1.	Lease hold area	845.74 ha.(917 ha)
2.	Mineable coal reserve	22.19 MT (balance)
3.	Volume of OB	98.20 Mm ³
4.	Average stripping ratio	1:4.43
5.	Annual coal target	3.5 MTPA
6.	Life of the project	07 years
7.	Quarry area on floor	182.78 ha
8.	Quarry area on surface	277.13 ha
9.	Initial depth of the quarry	37 mtr.
10.	Final depth of the quarry	176 mtr
11.	Average strike length on floor	3000 mtr
12.	Average strike length on surface	3000 mtr
13.	Average width of the quarry on floor	750 mtr
14.	Average width of the quarry on surface	1010 mtr
15.	Gradient of the seam	1 in 3.5 to 1 in 5
16.	Effective thickness of composite seam	27.43 to 28.34
17.	Grade processed rom	G11
18.	Length of the access trench	300 mtr
19.	Manpower	921

SI no	Particulars	
20.	Boundaries	Latitude : 21 ⁰ 14' 59" N to 21 ⁰ 16' 00" N, Longitude : 79 ⁰ 10' 22" E to 79 ⁰ 12' 50" E Toposheet : 55 O/3

Type and Method of Mining Operations: Gondagaon Ghatrohan OC is already in operation with Shovel Dumper system of mining and hence same technology has been envisaged in this updated RPR. Deployment of dragline is ruled out due to multi-seam working and varying thickness of partings between the coal seams. Due to steep gradient (1 in 3.5 to 1 in 5), Surface Miner deployment is also not feasible. Shovel-Dumper Technology is most flexible system and moreover, well adopted in coal mines of WCL. Considering the average gradient of mine inclined slicing method is envisaged in the mine.

11.3 Description of Environment and Anticipated Impact

The present scenario has been assessed by the data generated in post-monsoon season October, 2018 till January, 2019 for the project. Summarised baseline data is provided below:

11.3.1 Micrometeorology

Meteorological data collected at meteorological station representing the study area during the study period (October, 2018 till January, 2019) reveals the following status:

Wind Speed/Direction

Generally, moderate to stronger winds prevailed throughout the season. Winds were moderate particularly during the morning hours. During the afternoon hours the winds were stronger. Wind speed readings were ranging from ≤0.5 m/sec to 3.9 m/sec. The seasonal average wind speed was observed to be 1.4 m/sec.

The analysis of wind pattern during the season showed that the predominant wind directions were from East, North East followed by north having frequencies 15.40%, 12.00% & 5.43% respectively. The calm conditions prevailed 46.29%.

Temperature

Temperature values ranged between 8.4°C to 38.9°C. The seasonal average temperature value during this period was found to be 24.2°C.

Relative Humidity

The daily average relative humidity values were in the range of 40.0 to 73.0%. The seasonal average humidity value was found to be 59.7%.

Cloud Cover

Mostly clear sky was predominant during the study period.

Rainfall

Total 9 mm rainfall was recorded during the study period. The average rainfall during the season was found to be 0.09 mm.

11.3.2 Ambient Air quality Baseline Data

Summary of the observations made during the study period are as follows:

Juni Kamptee Village – (SA - 1)

At this location, PM₁₀ and PM_{2.5} concentration were observed in the range of 40.0 to 85.0 µg/m³ and 22.0 to 47.0 µg/m³. SO₂ and NO_x concentration were in the range of 6.5 to 12.3 µg/m³ and 9.2 to 15.3 µg/m³ respectively.

Gondegaon Transit Hostel – (SA - 2)

At this location, PM₁₀ and PM_{2.5} concentration were observed in the range of 40.0 to 70.0 µg/m³ and 22.0 to 39.0 µg/m³. SO₂ and NO_x concentration were in the range of 6.9 to 11.3 µg/m³ and 8.3 to 14.4 µg/m³ respectively..

Warada Village (SA - 3)

At this location, PM₁₀ and PM_{2.5} concentration were observed in the range of 51.0 to 78.0 µg/m³ and 28.0 to 43.0 µg/m³. SO₂ and NO_x concentration were in the range of 8.3 to 15.6 µg/m³ and 12.3 to 20.3 µg/m³ respectively.

Bina Village (SA - 4)

At this location, PM₁₀ and PM_{2.5} concentration were observed in the range of 41.0 to 69.0 µg/m³ and 23.0 to 38.0 µg/m³. SO₂ and NO_x concentration were in the range of 7.4 to 15.2 µg/m³ and 10.2 to 18.2 µg/m³ respectively.

Waregaon Village (SA - 5)

At this location, PM₁₀ and PM_{2.5} concentration were observed in the range of 41.0 to 61.0 µg/m³ and 23.0 to 34.0 µg/m³. SO₂ and NO_x concentration were in the range of 6.9 to 12.3 µg/m³ and 10.2 to 18.3 µg/m³ respectively.

Khairi Village (SA - 6)

At this location, PM₁₀ and PM_{2.5} concentration were observed in the range of 40.0 to 56.0 µg/m³ and 22.0 to 31.0 µg/m³. SO₂ and NO_x concentration were in the range of 8.2 to 16.3 µg/m³ and 13.2 to 20.3 µg/m³ respectively.

In general, All the values are found to be well within the AAQM Standards prescribed by CPCB.

11.3.3 Water quality

To assess the water quality, Six locations are identified and samples (6 Nos.) were collected and analyzed for physico-chemical and heavy metal parameters. Bacterial examination was also carried out to find out the Coliform contamination (if any) at water sources. The water quality all the parameters are found to be well within the prescribed norms of, IS: 10500 – 1991 (permissible) and IS: 2296 - 1982.

11.3.4 Hydrogeological quality

The average water levels fluctuations measured from the area in and around in year 2016 for Gondegaon OC are given below.

Pre monsoon period	Core Zone (within 3 km)	6.25 m to 8.10 m
	Buffer zone (within 10 km)	2.1 m to 15.5 m
Post monsoon period	Core Zone	2.10 m to 6.10 m
	Buffer zone	0.4 m to 15.5 m

11.3.5 Noise levels

Baseline data of Mean Leq noise levels at day time and night time was generated at six locations (two in core zone and four in buffer zone) for project. All noise levels values are found to be within the prescribed limits.

11.3.6 Land Use

The total land involved in existing Gondegaon OC is 845.74 ha. The present proposal of expansion envisages only increase in production capacity from 2.50 MTPA to 3.50 MTPA.

Table 28 Pre-mining land use details

Sl.No.	Particulars	Land(ha)
1)	Tenancy land	792.08
2)	Government land	53.66
3)	Forest land	NIL
	Total	845.74

Table 29 Land use of the project area during Mining

Sl. No.	Description	leasehold Area (Ha)
1	Quarry Area	277.13
2	Embankment Area	13.05
3	External OB dump	323.98
4	Infrastructure	50.00
5	Project Township	13.00
6	Rehabilitation Site	21.66
7	Area needed for rationalization and blasting zone	146.92
	Total	845.74

11.3.7 Socio Economic:

Positive impacts on socio-economic environment are expected due to creation of direct and indirect employment opportunities and development of infrastructure such as roads, schools, hospitals etc.

11.4 Anticipated Environmental Impacts and Mitigation Measures

To have a close watch on the environmental condition and implementation of various measures suggested, a multi- disciplinary approach is essential.

11.4.1 Air Quality:

Prediction of fugitive dust level in the surrounding is carried out (for 24 hours average) with the help of computerized Fugitive Dispersion Model (FDM90121 by USEPA), based on Gaussian Plume formulation. The resultant values are within limits as per CPCB rules.

Air Pollution Control Measures

In order to mitigate the adverse impacts on ambient air, the following main control measures have been proposed and will be implemented during the actual operation of the mine.

- a) Water sprinkling on road, stockpiles by mobile tankers.
- b) Black topping of road.
- c) Covering of trucks carrying coal & avoiding overloading of trucks.
- d) Development of adequate green belt all along the coal transportation road on both sides will be done.
- e) Blasting will be done between shifts or during the rest interval when the minimum number of persons are present around the blast area. In order to quickly disperse the dust generated in blasting operations, blasting will be avoided when there is wind. Blasting will be avoided in the mornings and during cloudy situations.
- f) Optimize travel distances through appropriate site layout and design.
- g) Vehicular emission of particulates, SO₂, NO_x, hydrocarbons can be minimized by proper training and maintenance of vehicles and other oil - operated equipment.
- h) Regular monitoring of ambient air quality as per CPCB rules for Coal Mines.

Plantation to Check Air Pollution

Plantation will be under taken in the mine area as mitigative measure against air pollution, noise pollution and to increase the aesthetic value. The plantation will be developed at suitable places like overburden dump, along the road sides, unused land etc. to arrest dust generated due to various mining operations viz. quarrying, coal and OB transportation, OB dumping, CHP operation. Total 255.64 Ha out of total 845.74 Ha (30%) area will be planted till the end of mine life.

11.4.2 Water Quality

Anticipated Impact

Mining and its associated activities not only use a lot of water but also likely to affect the hydrological regime of the area. The major impact of deep and large mines is of natural groundwater table. Lowering of water table may result in reduced groundwater availability. Extraction of different minerals is known to lead to water pollution due to heavy metal, acid discharges and increased suspended solids. However effect of coal mining due to nearby mines of Nagpur area on water is mainly observed as increase in suspended solids.

Salient controls measures to be taken to reduce water pollution are as follows:

i) Industrial Effluent

The waste-water from workshop and CHP, which normally remain laden with oil and grease, suspended and dissolved solids etc. will be treated in the Effluent Treatment Plant (ETP). Clear water coming out from the treatment plant will be taken into the closed water circuit and recycled for its reuse. All parameter of ETP waste discharge will be monitored regularly as per Env. (Protection) Amendment Rule, 2000.

ii) Mine Water

Most of the suspended particles will be settled in the sump located in the quarry and the supernatant water is pumped out to the sedimentation tank present on surface. This water is to be passed through sedimentation pond on surface, before being discharged in to natural drain or agricultural field.

iii) Surface Run-off

Adequate numbers of vegetation will be grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it will also reduce surface run-off, which helps averting siltation of natural water courses.

Impact on Hydro-Geological Regime

In the opencast mines, the different aquifers overlying the working coal seam would be contributing groundwater to the mine by gravity drainage since they are exposed/removed at the mine. The anticipated groundwater inflow to the mine is to the tune of 4332.00 m³/day(approx.). As such due to this pumping/gravity drainage, cone of depression would be formed. The shape and extent of the cone would depend on mainly hydraulic conductivity and specific yield of aquifers, mine depth & area etc.

Generally steep drawdown cone would be formed in poor potential aquifers, thereby the influence area will be limited to small distance and reverse is established in respect of aquifers with high hydraulic conductivity

The radius of mine influence area estimated for the Quarry-I & Quarry-II is 356 m and 406 m respectively based on the above mentioned aquifer. The stage of ground water development in the buffer zone (10 km from the periphery of the core zone) of Gondegaon OC comes to about 29.69%.

Conservation Measures:

1. The mine discharge will be utilized to meet the mine's domestic, dust suppression, firefighting and other industrial water needs.
2. The artificial recharge by water conservation structures in the outside mine influence areas will check water level lowering. The impact on ground water level is being minimized by artificial recharge by spreading of pumped out water, creation and filling of ponds with mine water and construction of rainwater harvesting structure.
3. After the cessation of mining, with copious rainfall and abundant groundwater recharge, the water levels will recoup and attain normalcy. Thus, the impact of mining on groundwater system may be considered as a temporary phenomenon. The old mine workings also behave as water pools and improves the resource availability in the area.
4. The discharged mine water would be available for the local people to utilize in irrigation and domestic use. Thereby the mine water will be a resource for many of the local villagers.

5. Monitoring of water quality of mine water discharge, local river/nala and domestic water (dug well/hand pumps) will be done under routine monitoring. On analyzing the field data if any area receiving the maximum impact, suitable controls measures will be adopted by the project authorities.

11.4.3 Noise Quality

In order to assess the existing ambient noise level in the surrounding of proposed project site, the baseline data generated for Gondegaon OC in Post-Monsson season 2018-19 is documented in chapter III of the EIA & EMP report and noise level values have been found to be within permissible limits.

Noise Pollution Control Measures

Monitoring of the noise control will be carried out on regular basis as per the Environment (Protection) Amendment Rule 2000. While planning for an effective noise attenuation measures, the concept of source, path and receiver has been considered.

11.4.4 Impact on Land and Land Reclamation

Total area required for the project in phase-I is 845.74 Ha. The land use in core zone is mainly agricultural land. So the major impact on land will degradation of agriculture land in the mining area.

The following activities have been proposed for reclamation of land.

1. Backfilling of the excavated area at the time of mine closure.
2. Levelling of the backfilled area and carpeting with the topsoil.
3. Creation of garland drains in order to arrest the silt load, due to erosion, to enter into natural watercourses during surface run-off.
4. Grass, legumes and different types of plants etc. will be planted on such reclaimed land in order to make it, as far as possible, conducive to agricultural growth.
5. Technical and biological reclamation of external OB dump and rehandling at the end of mine life. The density of trees will be around 2500 plants/Ha.

11.4.5 Rehabilitation & Resettlement

R & R of the Gondegaon Village is in progress after constituting a committee for proper execution of the National R & R Policy on the Sub Area and Area level, Nagpur Area. The land compensation paid is Rs.11,52,10,812.00 INR

only. All required amenities has been provided at rehab site. Some villagers have already shifted to new Gondegaon rehabilitation site & construction of their new houses is under progress

11.4.6 Progressive Mine Closure Plan

As This proposal is for enhancement of mine capacity from 2.50 Mty to 3.50 Mty. Accordingly, the Revised Mine Corpus for Gondegaon Extension Opencast Coal Mine Expansion project (Amalgamated Gondegaon Ghatrohan OC mine) has been prepared in October, 2017 based on the approved Mining Plan of Gondegaon Extension Opencast Coal Mine Expansion project (Amalgamated Gondegaon Ghatrohan OC mine) prepared by WCL for enhance target capacity of 3.50 Mty and life of 10 years (balance life of 7 years as on 01.04.2018)

Year	Mine Closure Amount Deposited in Escrow A/c
2013-14	Rs 14.8284 crs
2014-15	Rs 5.9528 crs
2015-16	Rs 2.5502 crs
2016-17	Rs 4.3733 crs
2017-18	Rs 5.0458 crs
Total	Rs 32.7506 crs

11.5 Environmental Monitoring Programme

The Environmental Monitoring Programme will be carried out as per statutory requirements and detailed in the chapter – IV of the EIA report.

Environment Management Cell

WCL, has an Environment Deptt. headed by General Manager (Env.) at its HQ. The department provides necessary support that are required for environmental management of various mining projects under the jurisdiction of the company. At area level, Area General Manager co-ordinates the activities of various disciplines in the area to render all necessary assistance at the implementing level i.e. the Project level. Nodal Officer (Environment) of the area monitors all aspects of environment on behalf of the Area General Manager. He will also take suitable steps for generation of

environmental data along with CMPDI team for its analysis and interpretations.

11.6 Environmental Cost Projection

A capital provision of Rs **147.09** lakhs has been made against environment protection. Rs. 6.00/t of coal has been provided to absorb environmental related cost in the project.

11.7 Provision for CSR Work

The fund for the CSR will be allocated based on 2% of the average net profit of the Company for the three immediate preceding financial years or Rs 2.00 per Tonne of Coal Production of the previous year whichever is higher.

11.8 Conclusion

The mining sequence has been planned in a way to maximise internal dumping so that least area is required for external OB dumping.

The project authorities need to follow the mitigation measures strictly as given in the EIA & EMP report. This will minimise the impact on environment.

The Expansion of Gondagaon Extn OC may be granted Amended Environmental Clearance (Extension in validity) so that the project can bridge the gap between demand and supply of coal in the country.

EC compliance certificate against the existing EC conditions has been secured from Regional Office, MoEF & CC vide letter no F. No. EC-766/2018-NGP/4810 dt 21.01.2019

CHAPTER-XII: DISCLOSURE OF CONSULTANTS ENGAGED

Central Mine Planning & Design Institute Limited. Briefly, it is called as 'CMPDI'. Its registered corporate office is situated at Gondwana Place, Kanke Road, Ranchi – 834031, a capital city of Jharkhand State. It operates through seven strategically located Regional Institutes over six states territories of India as follows:-

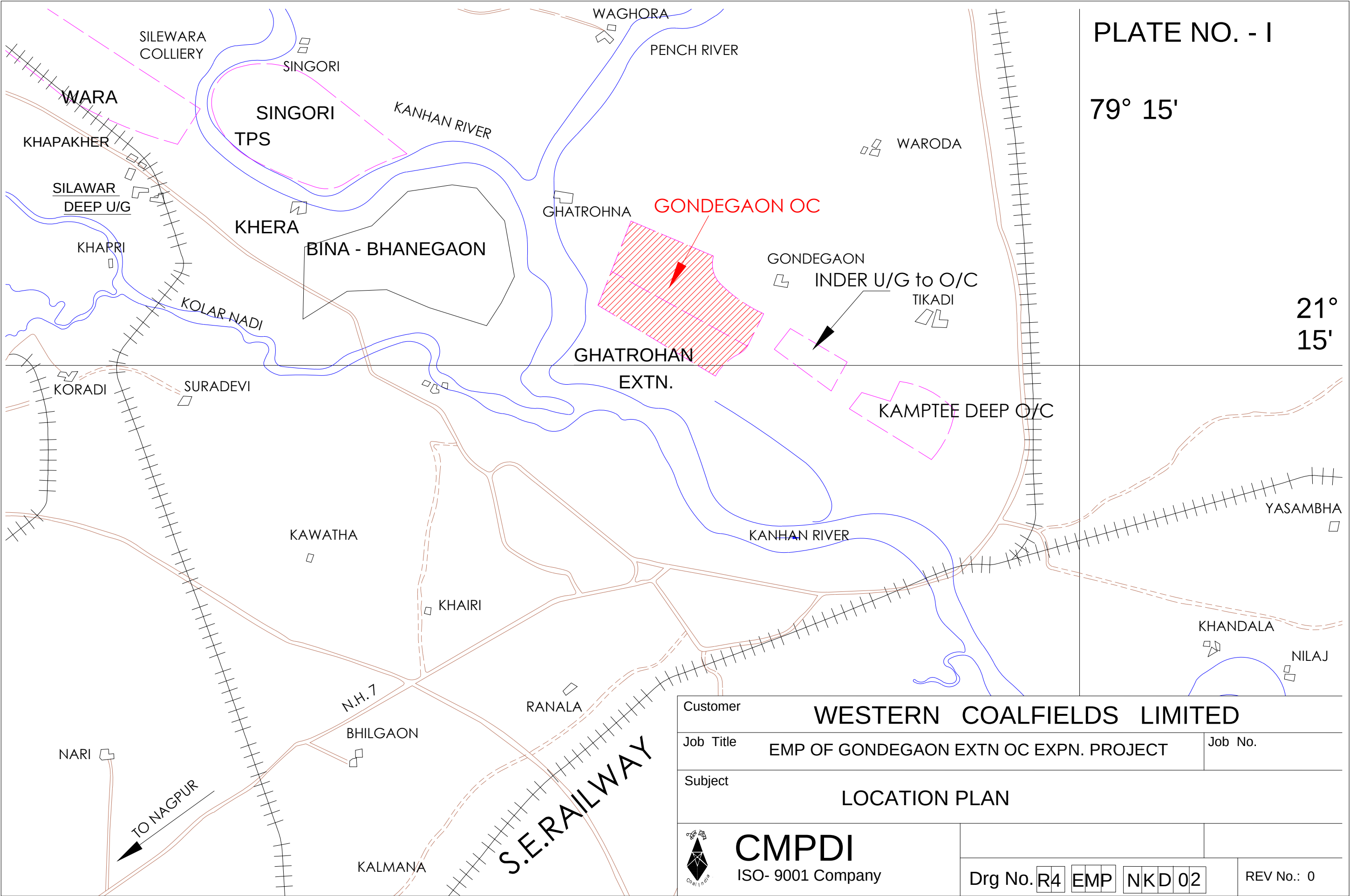
Sl. No.	Institutes	Dedicated to
1	Regional Institute-I	Eastern Coalfields Ltd. (ECL)
2	Regional Institute-II	Bharat Coking Coal Ltd. (BCCL)
3	Regional Institute-III	Central Coalfields Ltd. (CCL)
4	Regional Institute-IV	Western Coalfields Ltd. (WCL)
5	Regional Institute-V	South Eastern Coalfields Ltd. (SECL)
6	Regional Institute-VI	Northern Coalfields Ltd. (NCL)
7	Regional Institute-VII	Mahanadi Coalfields Ltd. (MCL)

Hqrs. Ranchi is committed to render services to NEC & Non-CIL clients and specialized assignments for both CIL & Non-CIL clients. As on 1st May 2018, CMPDIL has a total manpower strength of 3439 nos employee (946 nos Executives, 496 nos Supervisory & 1942 nos Workmen).

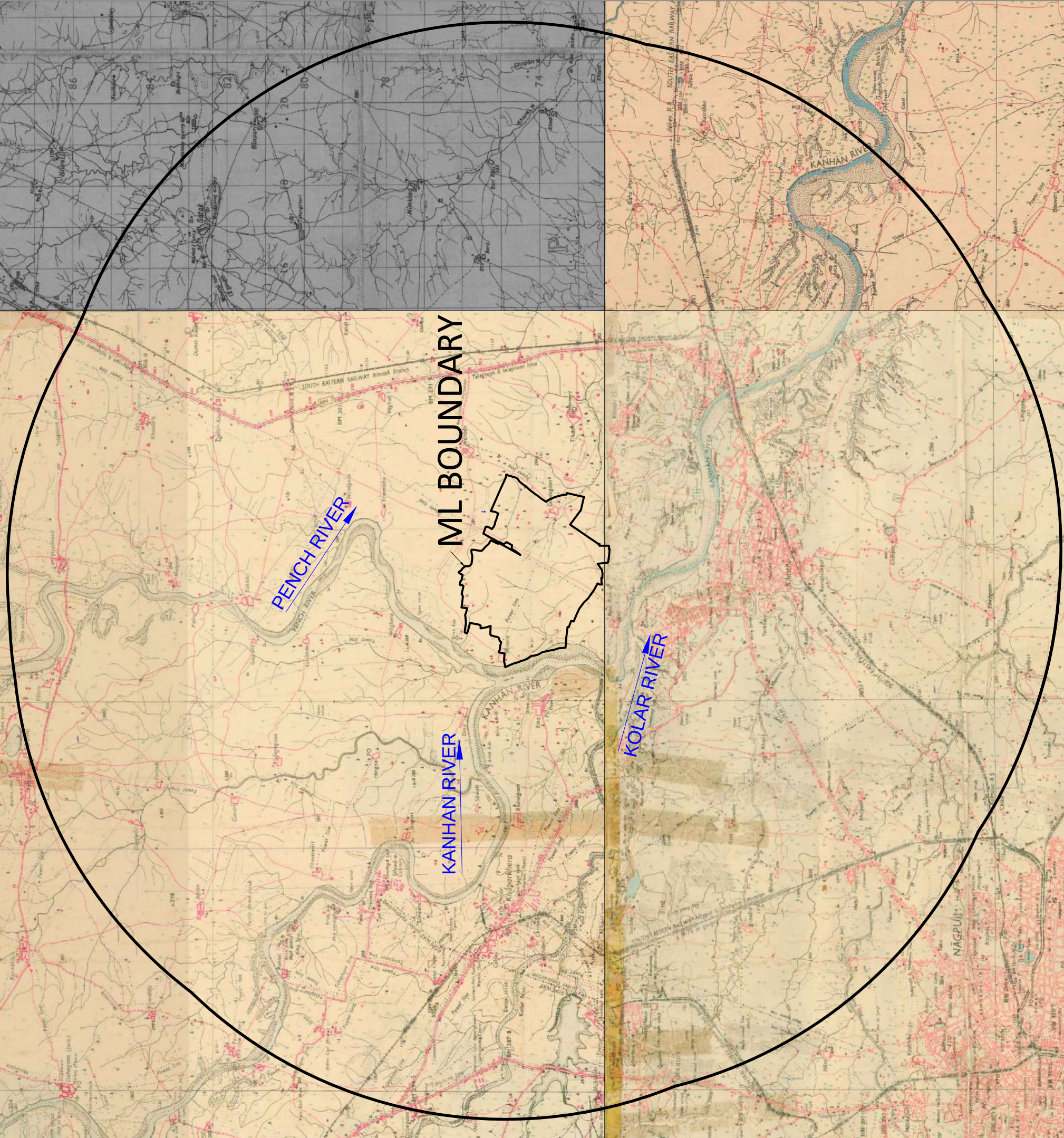
CMPDI is accredited with National Accreditation Board for Education & Training (NABET) of Quality Council of India vide letter no. NABET/EIA/1720/RA 0092 valid till 01.10.2020

CMPDI has very well equipped environment laboratories at its HQ as well as Regional Institutes. Environment Laboratory of RI-IV, Nagpur has been accredited with National Accreditation Board for Testing and calibration Laboratories (NABL) with conformance of ISO 17025:2005 vide certificate no. TC-7102 dt. 24.05.2018. The laboratory at CMPDI, RI-IV caters to the need of monitoring of Environmental parameters exclusively of Western Coalfields Limited.

LOCATION PLAN

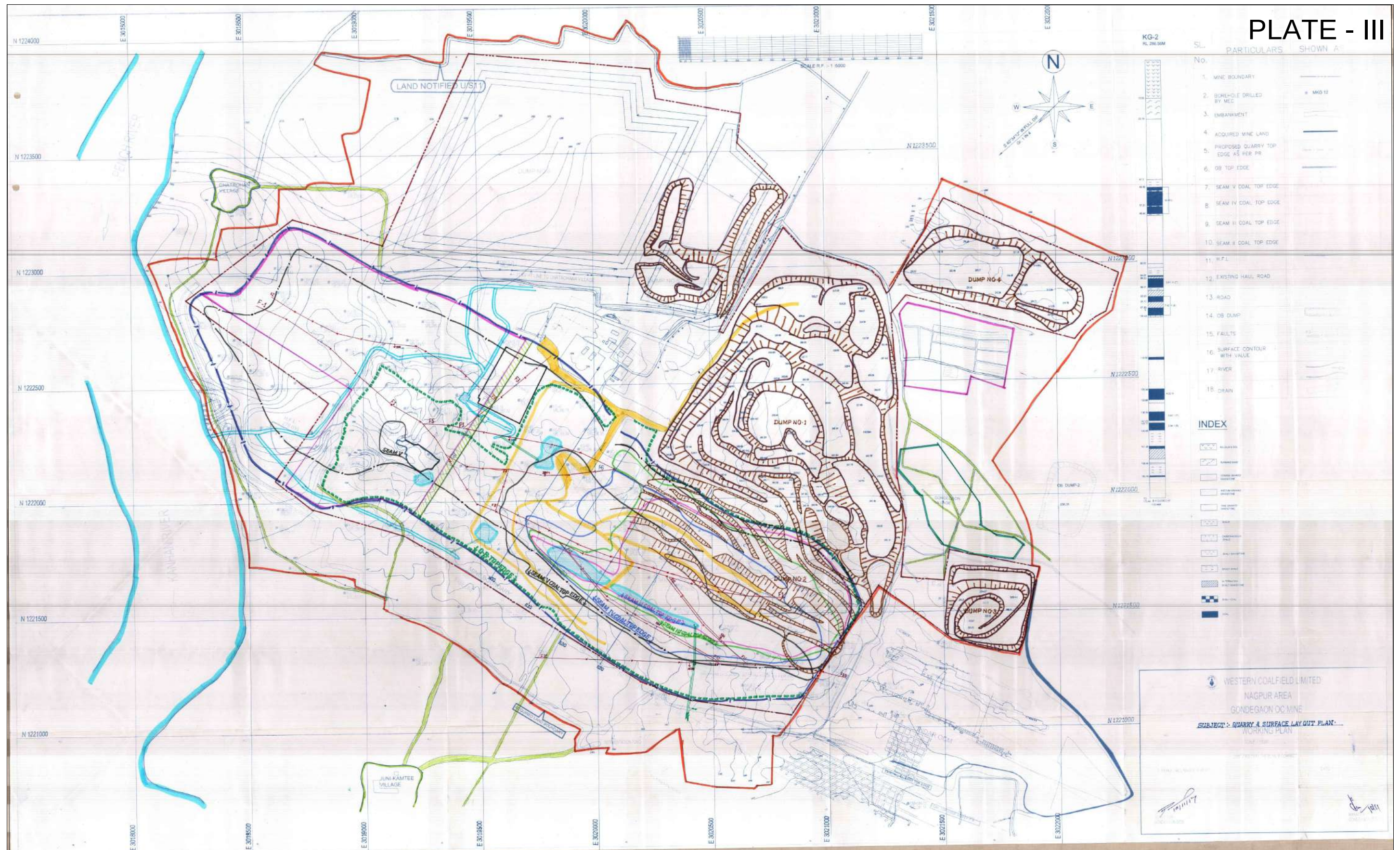


TOPOSHEET PLAN



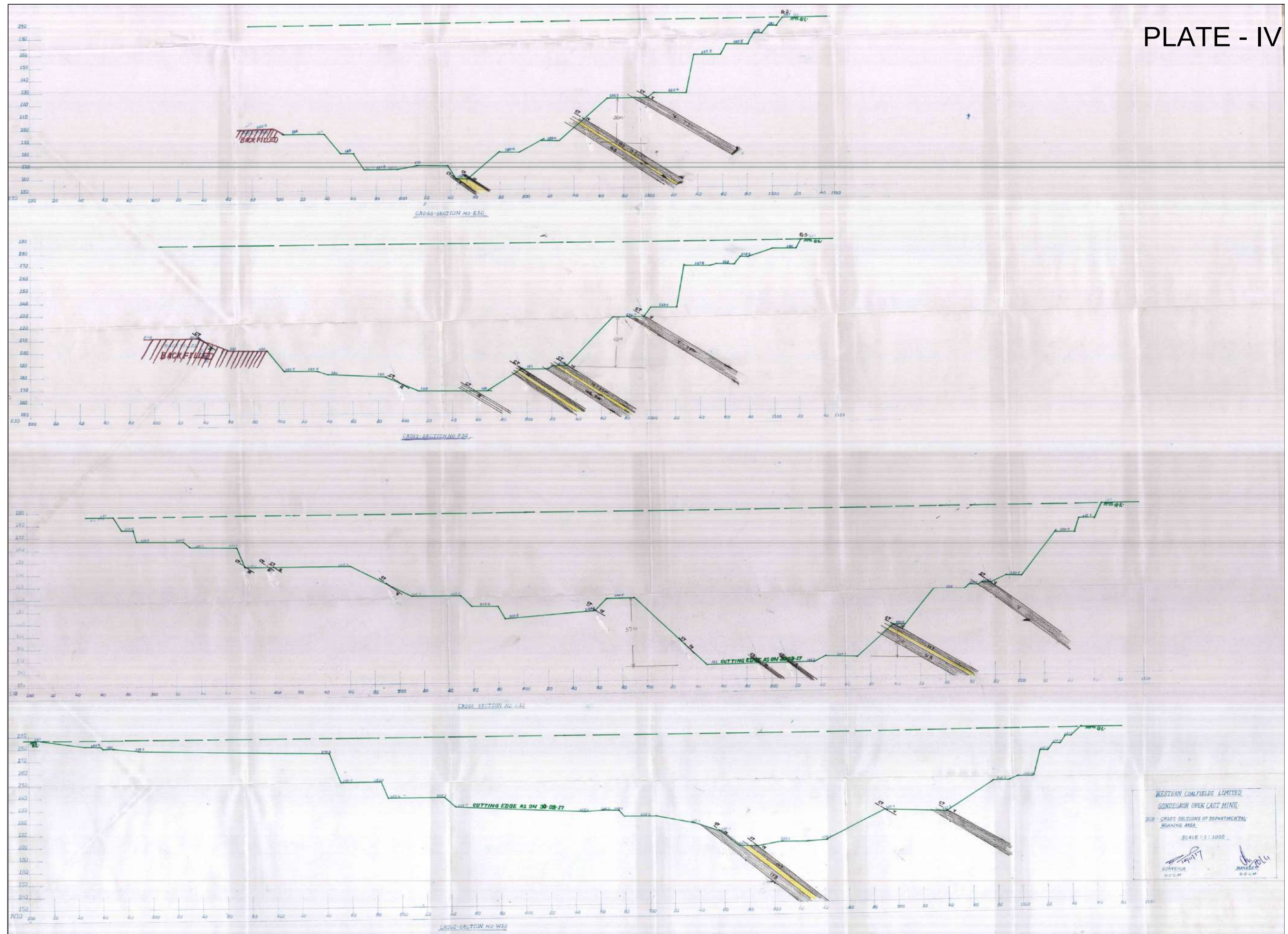
NOTE :- PLAN DRAWN UPON SOI TOPOSHEET
55 O/3, 55 O/4, 55 O/7 & 55 O/8.

QUARRY AND SURFACE LAYOUT PLAN

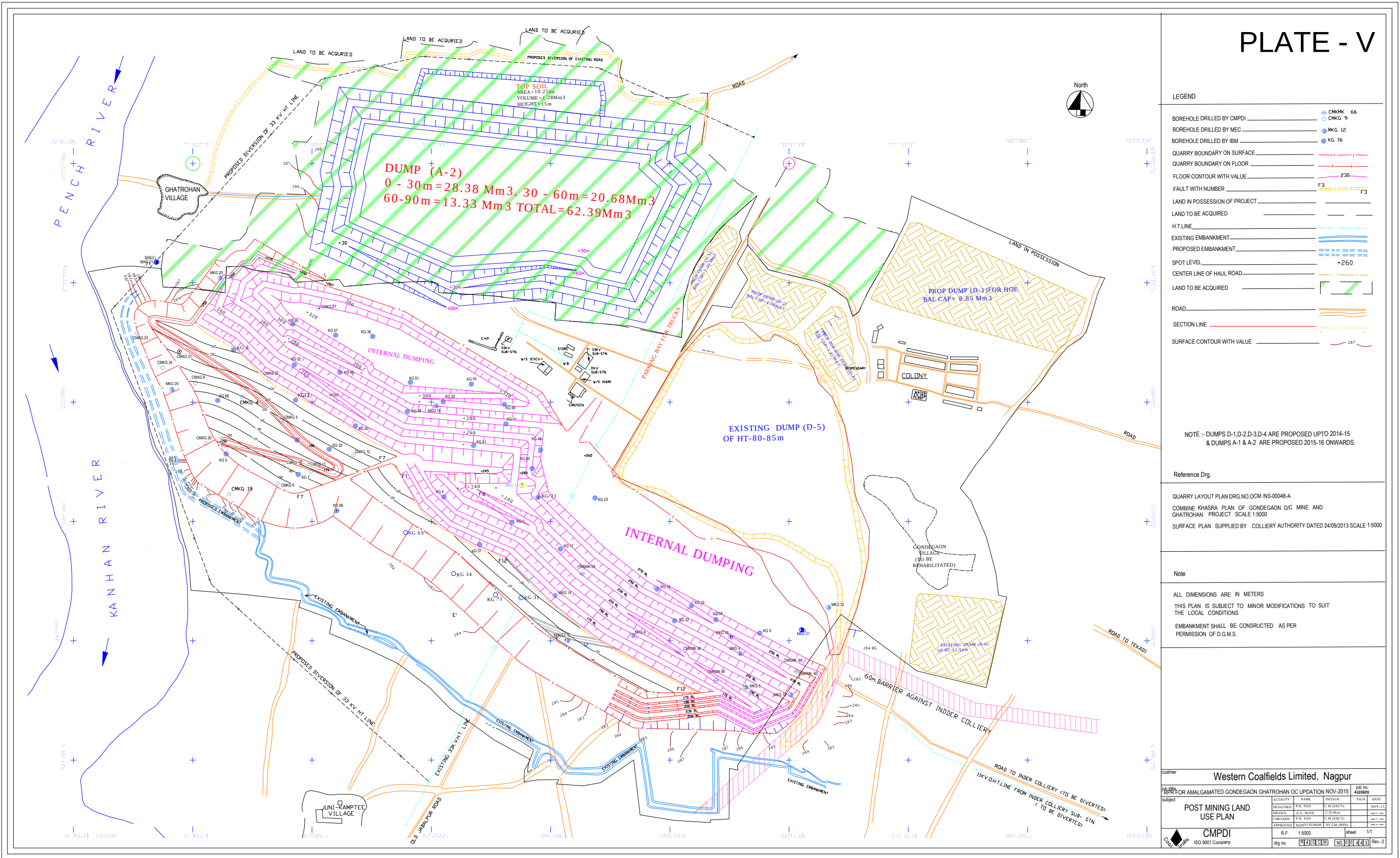


QUARRY CROSS SECTION

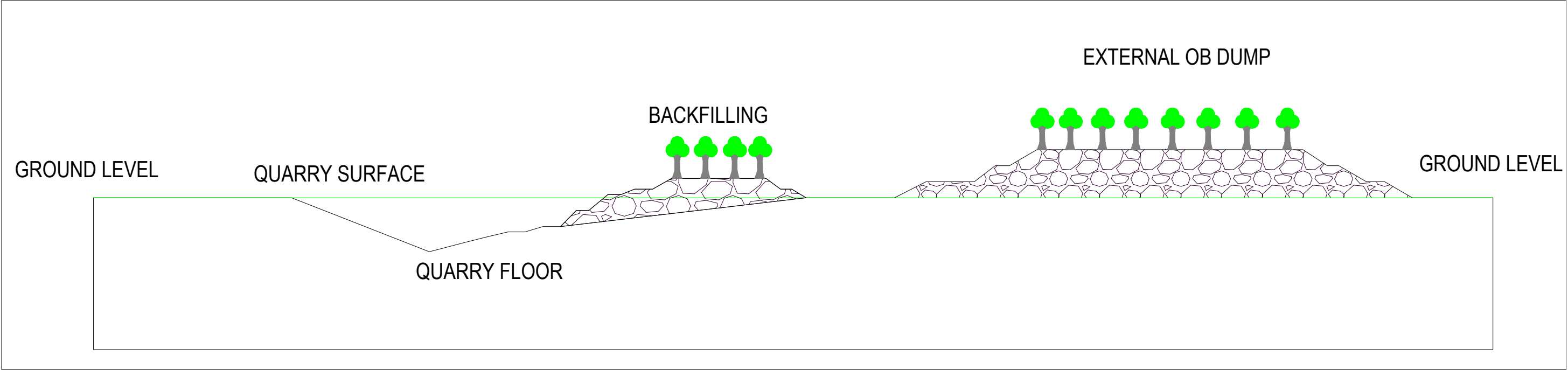
PLATE - IV

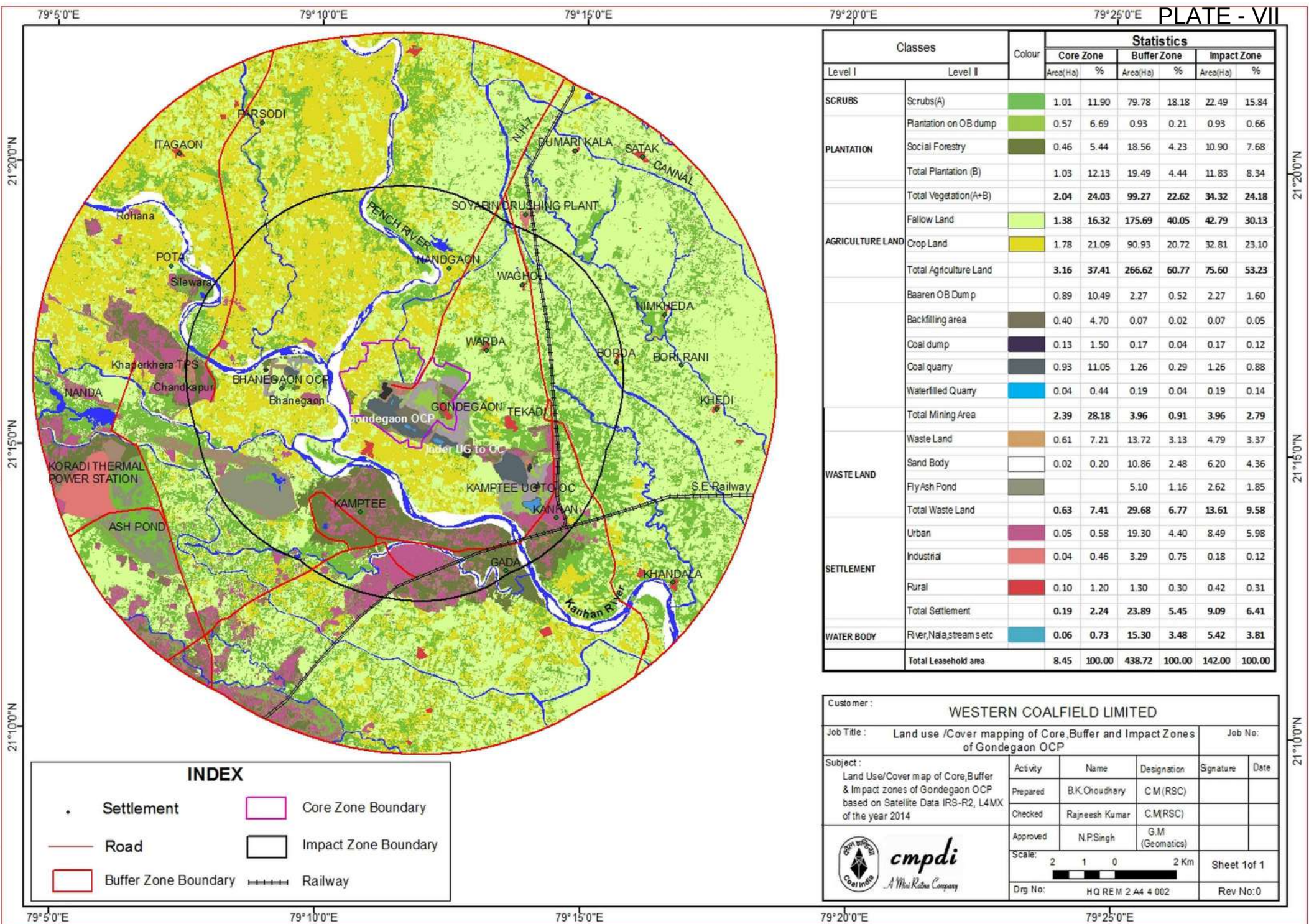


POST MINING LAND USE PLAN



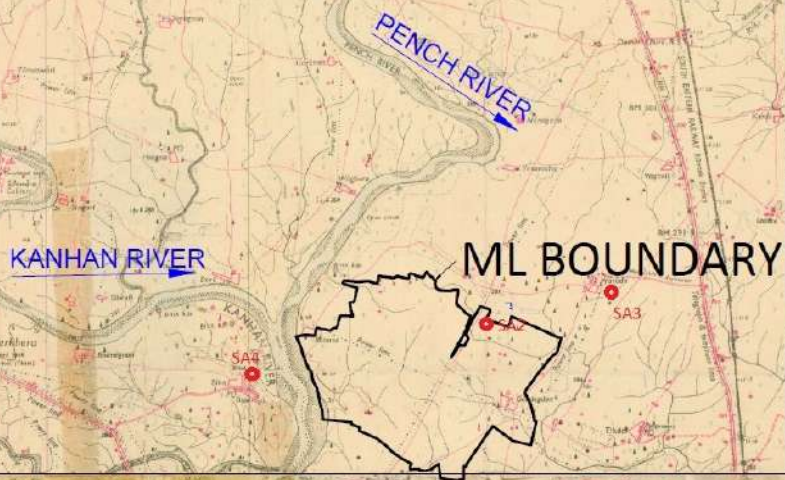
GONDEGAON CROSS SECTION - POST MINING





TOPOSHEET PLAN

AIR QUALITY MONITORING LOCATIONS



NOTE :- PLAN DRAWN UPON SOI TOPOSHEET
55 O/3, 55 O/4, 55 O/7 & 55 O/8.

No.J-11015/106/2009-IA.II(M)
Government of India
Ministry of Environment, Forest and Climate Change
IA-II (Coal Mining) Division

Indira Paryavaran Bhawan,
Jorbagh Road, N Delhi - 3
Dated: 14th March, 2018

To,

The General Manager (Environment),
M/s Western Coalfields Ltd,
Coal Estate, 9th Floor, Civil Lines,
Nagpur - 1 (Maharashtra)

Email: gmenvironment.wcl@nic.in; wclenv@yahoo.in

Sub: Expansion of Gondegaon Extension Opencast Coal Mine Project from 2.5 MTPA to 3.5 MTPA by M/s Western Coalfields Limited in an area of 917 ha in Village Gondegaon, Tehsil Parseoni, District Nagpur - Environmental Clearance - reg.

Sir,

This is with reference to your application No.WCL/HQ/ENV//6-E & 20-C/1275-1277 dated 14.12.2017 along with the online proposal No.IA/MH/CMIN/71601/2017 dated 14.12.2017 and subsequent letter dated 15.12.2017, 22.12.2017, 04.01.2018, 11.01.2018, 15.01.2018, 25.01.2018 and 8.02.2018 on the above mentioned subject.

2. The Ministry of Environment, Forest and Climate Change has considered the proposal is for grant of environmental clearance to the project for expansion Gondegaon Extension Opencast Coal Mine from 2.5 MTPA to 3.5 MTPA by M/s Western Coalfields Limited in a total project area of 917 ha (ML area of 845.74 ha) in Village Gondegaon, Tehsil Parseoni, District Nagpur (Maharashtra).

3. The proposal was considered by the Expert Appraisal Committee (EAC) in the Ministry for Thermal & Coal Mining Sector in its 24th meeting held on 11th January, 2018. The details of the project, as per the documents submitted by the project proponent, and also as informed during the meeting, are reported to be as under:-

(i) Gondegaon Extension Opencast Coal Mine Expansion (Amalgamated Gondegaon-Ghatrohan OC Mine) is located in the Nagpur district of Maharashtra State and is under the administrative control of Nagpur Area of Western Coalfields Ltd. Mine was opened in Kamptee-Silewara Coalfields in Nagpur district and is about 35 km from Nagpur having a approach road of 7 km on Nagpur- Jabalpur national highway and the nearest railway station is of the mine is Kanhan (almost 15 Km).

(ii) The project lies between latitudes E 21°14'59"- E 21°16'00" and longitudes N 79°10'22"- N 79°12'50". The area is covered by Survey of India Toposheet No.55 O/3.

(iii) The EC for expansion of Gondegaon Extension Opencast Coal Mine Project (1.5 to 2.5 MTPA) for a total lease area of 917 ha was accorded vide letter dated 15th July, 2009.

(iv) Present manpower of the project is 450 Nos and no additional manpower required.

(v) The Mining Plan including the Mine Closure Plan for further expansion of the subject mine for increasing the production capacity from 2.50 MTPA to 3.50 MTPA within the EC



sanctioned land area and without any capital investment has been approved by the WCL Board in its meeting held on 31st October, 2017.

(vi) The proposed quarry area is bounded by SH No.233 in North, Kanhan River in West and South and in crop of seam-I in East. The surface area is generally undulating with elevations ranging from 278 m to 288 m above MSL.

(vii) The geo-mining parameters are placed below

S. No.	Particulars	
1.	Lease hold area	845.74 ha
2.	Mineable coal reserve (2015-16)	29.23 MT
3.	Total OB including access trench (Balance as on 01.04.2017)	111.95 Mm ³
4.	Average stripping ratio	1:4.487
5.	Life of the project	Existing: 10 years proposed: 08 years
6.	Quarry area on floor	82.74 ha
7.	Quarry area on surface	277.13 ha
8.	Initial depth of the quarry	37 m
9.	Final depth of the quarry	176 m
10.	Gradient of the seam	1 in 3.5 to 1 in 5
11.	Effective thickness of composite seam	27.43 to 28.34
12.	Grade processed rom	G11
13.	Length of the access trench	300 m
14.	Manpower	450
15.	Boundaries	Latitudes: E21°14'59"-E21°16'00" Longitudes: N79°10'22"-N79°12'50"

(viii) The scheduled quantities for balance life of the mine with capacity enhancement from 2.50 to 3.50 MTPA are as under:

Table 1 Calendar Programme

Sl.No.	year	Coal Prod. MT	Over Burden Removal in Mm ³		
			HOE	Dept.(consideri ng as on date capacity)	Total
1	2015-16	2.13 (Act.)	0.42	3.84	4.26
2	2016-17	2.15 (Act.)	0.76	4.35	5.11
3	2017-18	2.8	6.82	4.8	11.62
4	2018-19	3.0	7.65	4.8	12.45
5	2019-20	3.2	8.48	4.8	12.28
6	2020-21	3.4	9.31	4.8	14.11
7	2021-22	3.5	10.90	4.8	15.70
8	2022-23	3.5	10.90	4.8	15.70
9	2023- 24	3.5	9.70	4.8	14.5
10	2024 - 25	2.05	9.78	4.8	14.58
	Total	29.23	74.72	46.59	121.31

Last 5 years production is as given below (All figures in Million Tonnes per Annum)

Year	Coal Production	EC capacity
2016-17	2.15	2.50
2015-16	2.13	2.50
2014-15	1.86	2.50
2013-14	1.70	2.50
2012-13	1.82	2.50

(ix) The land usage of the project will be as follows:

The total land involved in existing Gondagaon OC is 845.74 ha is within the sanctioned EC area of 917.00 ha. The present proposal of expansion envisages only increase in production capacity from 2.50 MTPA to 3.50 MTPA. The land use changes will remain same as per the previously sanctioned EC letter No J-11015/106/2009-IA.II (M) dated 15th July, 2009.

(x) Details of change in land use as per sanctioned EC is provided below:

Pre-mining land use

S. No.	Particulars	Land(ha)
1)	Tenancy land	792.08
2)	Government land	53.41
3)	Forest land	NIL
	Total	845.74

During mining land use:

Sl. No.	Description	leasehold Area (ha)
1	Quarry Area	277.13
2	Embankment Area	13.05
3	External OB dump	323.98
4	Infrastructure	50.00
5	Project Township	13.00
6	Rehabilitation Site	21.66
7	Area needed for rationalization and blasting zone	146.92
	Total	845.74

The post mining land use:

S. N.	Land use	Land use (ha)				
		Plantation	Water Body	Public use	Undisturbed	Total
1	External OB Dump	40.00	0.00	0.00	0.00	323.98
2	Excavation	40.00	237.13	0.00	0.00	277.13
3	Roads	1.00	0.00	4.74	0.00	5.74
4	Built up area	44.64	0.00	47.33	0.00	91.97
5	Undisturbed Area	130.00	0	0	16.92	146.92
	Total	255.64	237.13	52.07	16.92	845.74

- (xi) The existing mine working including the proposed expansion will be limited within 845.74 Ha (as per approved RPR Nov.2015) & this mining plan under consideration.
1. Mineable Coal Reserves in Million Tonnes as per R.P.R: 29.23 MT.
 2. Stripping Ratio Cu.M./Te : 4.15 m³/t
 3. Over Burden (MM³) : 121.31
- (xii) The coal grade is GCV (4001-4300) k Cal /kg (Grade G-11).
- (xiii) Total estimated water requirement is 1450 m³/day. The level of ground water ranges from 6.25 m to 8.10m (Pre Monsoon), 2.10m to 6.10 m (Post Monsoon).
- (xiv) The method of mining would continue to be Opencast with Shovel-Dumper combination.
- (xv) There are six external OB dumps with Quantity of 81.01 Mm³ and area of 323.98 ha and internal dump of 40.30 Mm³ in an area of 79 ha. The final mine void would be in 198.13 ha with depth 176 m.
- (xvi) Total quarry area is 277.13 ha. Out of total quarry area of 277.13 ha, 79 ha would be backfilled and reclaimed. Out of which 40 ha area shall be reclaimed with plantation. A void of 198.13 ha with depth 176 m which is proposed to be converted into a water body.
- (xvii) The balance life of mine is 8 Years at the peak capacity of 3.5 MTPA.
- (xviii) Transportation: Coal transportation in pit by through Dumpers from in pit to pit head coal handling plant, Coal from CHP to consumer is transported to railway siding (Approximately 10 km) over fully black topped Road and in tarpaulin covered trucks.
- (xix) There is no additional R&R involved in the proposed scheme. The resettlement of Gondagaon village (Householders 721) is already in progress. All basic amenities as per town planning department of Maharashtra, have been completed. Total land of the new rehabilitation site is 21.66 ha. The site has been provided with primary health centers, primary school, water pump house, gram panchayat office, WBM road, overhead water tank of capacity 2.00 Lakh Liters. 1100 no. of saplings have been planted and 2 no. of cattle shed constructed. 350 families have already shifted to new site. 150 houses are under construction.
- (xx) Cost: Total capital cost of the project is Rs. 198.6824 Crores excluding WDV of 39.7224 Crores (As on 13.02.2016) and no additional capital is required for the present proposal. CSR Cost based on 2% of the average net profit of the Company for the three-immediate preceding financial years or Rs 2.00 per Tonne of Coal Production of the previous year whichever is higher. Total Land compensation (R&R) Cost incurred is Rs.11,52,10,812.00 INR. Environmental Management Cost: Capital – Rs147.09 Lakhs and Revenue- @ Rs 6/tonne.
- (xxi) Water body: The main drainage is controlled by Southerly flowing Kanhan river along the Western and Southern boundaries of the block. Minor seasonal streams originating within the block drain into Kanhan river. In general, the area is sloping towards South West and South.
- (xxii) Approvals: Ground water clearance:- NOC for withdrawal of groundwater from CGWA has been applied vide letter no. WCL/ENV/HQ/20-J & 17-U/263 dated 13.06.2016 as per amended rules of 2012. Board's approval obtained on 10.11.2017. Mining plan has been approved on 10.11.2017. Mine closure plan is an integral part of mining plan.
- (xxiii) Wildlife issues: There are no national Parks, wildlife sanctuary, biosphere reserves found in the 10 km buffer zone.
- (xxiv) Public Hearing conducted on 26.04.2005 for 917.00 Ha land.
- (xxv) There is no forest land involved in the project.
- (xxvi) Total afforestation plan shall be implemented covering an area of 255.64 ha at the post-mining. Density of tree plantation is 2500 trees/ ha of plants.
- (xxvii) There are no court cases/violation pending with the project proponent.
- (xxviii) The existing Gondagaon OC has opened Escrow Account against the existing provisions and till 2016-17 Rs. 27.7047 Crores have been deposited in the said Escrow Account.



4. The Expert Appraisal Committee in its 24th meeting held on 11th January, 2018 has recommended the project for grant of environmental clearance for a period of one year. Based on recommendations of the EAC, the Ministry of Environment, Forest and Climate Change hereby accords environmental clearance to the proposal for expansion of **Gondegaon Extension Opencast Coal Mine Project from 2.5 MTPA to 3.5 MTPA by M/s Western Coalfields Ltd in a total area of 917 ha (Mine lease area 845.74 ha) located at village Gondegaon, Tehsil Parseoni, District Nagpur (Maharashtra)** for a period of one year, under the provisions of the Environment Impact Assessment Notification, 2006 and subsequent amendments/circulars thereto subject to the compliance of the terms & conditions and environmental safeguards mentioned below:

- (i) Mitigative measures to be undertaken to control dust and other fugitive emissions all along the roads by providing sufficient numbers of water sprinklers. Mist type mobile sprayers/sprinklers shall be deployed for the project.
- (ii) Regular monitoring of occupational safety and other health hazards of all employees including outsourced workers and the corrective actions shall be ensured. Report in this regard be submitted to the Regional Office of the Ministry.
- (iii) Controlled blasting techniques should be adopted to control ground vibration and fly rocks.
- (iv) Persons of nearby villages shall be given training for their livelihood and skill development.
- (v) To ensure health and welfare of nearby villages, regular medical camps shall be organized and report shall be submitted to the Regional Office of the Ministry.
- (vi) Wind barrier wall/screen and vertical greenery system, green belt, dust suppression arrangement at railway siding to be installed.
- (vii) Three tier multi-species green belt of not less than 7.5 m width should be developed all along the project to mitigate/check the dust pollution. Only native species to be used for plantation/greenbelt development.
- (viii) In view of the mining potential of the area and the prevailing environmental concerns, carrying capacity of the riverine eco-system shall be studied through some expert agencies to assess impact on the environmental components.
- (ix) A mitigation plan based on the study to be submitted to the MOEF&CC Regional Office/SPCB and displayed on company's website.

4.1 The grant of EC is further subject to compliance of the generic conditions as under:

(a) Mining

- (i) Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there-under as applicable.
- (ii) No change in mining method i.e OC to UG, calendar programme and scope of work shall be made without obtaining prior approval of the Ministry of Environment, Forest and Climate Change (MoEFCC).
- (iii) Mining shall be carried out as per the approved mining plan(including Mine Closure Plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).
- (iv) No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980 and also adhering to The Scheduled Tribes and Other

Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 read with provisions of Indian Forest Act, 1927.

(b) Land reclamation and water conservation

(i) Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:50,000 scale shall be submitted to Ministry of Environment, Forest and Climate Change/Regional Office (RO).

(ii) The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of river/rivulet/pond/lake etc, shall be prepared and implemented by the project proponent. The surface drainage plan and/or any diversion of natural water courses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/Gol Authority. The construction of embankment to prevent any danger against inrush of surface water into the mine should be as per approved Mining Plan and permission of the DGMS.

(iii) The final mine void depth should preferably be as per the approved Mine Closure Plan, and in case it exceeds 40 m, adequate engineering interventions shall be provided for sustenance of aquatic life therein. The remaining area shall be backfilled and covered with thick and alive top soil. Post-mining land be rendered usable for agricultural/forestry purposes and shall be handed over to the respective state government as specified in the guidelines for Preparation of Mine Closure Plan issued by the Ministry of Coal dated 27th August, 2009 and subsequent amendments.

(iv) The entire excavated area, backfilling, external OB dumping (including top soil) and afforestation plan shall be in conformity with the "during mining"/"post mining" land-use pattern, which is an integral part of the approved Mining Plan and the EIA/EMP submitted to this Ministry. Progressive compliance status vis-a-vis the post mining land use pattern shall be submitted to the Ministry of Environment, Forest and Climate Change/Regional Office on six monthly basis.

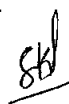
(v) The top soil shall temporarily be stored at earmarked site(s) only and shall not be kept unutilized for long. The top soil shall be used for land reclamation and plantation purposes. Active OB dumps shall be stabilized with native grass species to prevent erosion and surface run off. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforested in line with the approved Mine Closure Plan. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the MoEF&CC on six monthly basis.

(c) Emissions, effluents, and waste disposal

(i) Transportation of coal, to the extent permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as regular water/mist sprinkling/rain gun etc shall be carried out in critical areas prone to air pollution (with higher values of PM₁₀/PM_{2.5}) such as haul road, loading/unloading and transfer points. Fugitive dust emissions from all sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/State Pollution Control Board.



- (ii) Greenbelt consisting of 3-tier plantation of width not less than 7.5 m shall be developed all along the mine lease area in a phased manner. The green belt comprising a mix of native species shall be developed all along the major approach/ coal transportation roads.
- (iii) The transportation of coal shall be carried out as per the provisions and route proposed in the approved Mining Plan. Transportation of the coal through the existing road passing through any village shall be avoided. In case, it is proposed to construct a 'bypass' road, it should be so constructed so that impact of sound, dust and accidents are appropriately mitigated.
- (iv) Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.
- (v) Coal stock pile/crusher/feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors shall be fully covered to avoid air borne dust. Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.
- (vi) Coal handling plant shall be operated with effective control measures viz. bag filters/water or mist sprinkling system etc to check fugitive emissions from crushing operations, conveyor system, transfer points, etc.
- (vii) Ground water, excluding mine water, shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.
- (viii) Catch/garland drains and siltation ponds of appropriate size shall be constructed around the mine working, coal heaps & OB dumps to prevent run off of water and flow of sediments directly into the river and water bodies. Further, dump material shall be properly consolidated/ compacted and accumulation of water over dumps shall be avoided by providing adequate channels for flow of silt into the drains. The drains/ ponds so constructed shall be regularly de-silted particularly before onset of monsoon and maintained properly. Sump capacity should provide adequate retention period to allow proper settling of silt material. The water so collected in the sump shall be utilised for dust suppression measures and green belt development. Dimension of the retaining wall constructed, if any, at the toe of the OB dumps within the mine to check run-off and siltation should be based on the rainfall data. The plantation of native species to be made between toe of the dump and adjacent field/habitation/water bodies.
- (ix) Industrial waste water generated from CHP, workshop and other waste water, shall be properly collected and treated so as to conform to the standards prescribed under the Environment (Protection) Act, 1986 and the Rules made there under, and as amended from time to time. Oil and grease trap shall be installed and maintained fully functional with effluents discharge adhering to the norms. Sewage treatment plant of adequate capacity shall be installed for treatment of domestic waste.
- (x) Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.



(d) Illumination, noise & vibration

- (i) Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submitted to this ministry & its RO on six-monthly basis.
- (ii) Adequate measures shall be taken for control of noise levels below 85 dB(A) in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with personal protective equipments (PPE) like ear plugs/muffs in conformity with the prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.
- (iii) Controlled blasting techniques shall be practiced in order to mitigate ground vibrations and fly rocks as per the guidelines prescribed by the DGMS.
- (iv) The noise level survey shall be carried out as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in this regard shall be submitted to the Ministry/RO on six-monthly basis.

(e) Occupational health & safety

- (i) The project proponent shall undertake occupational health survey for initial and periodical medical examination of the workers engaged in the project and maintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS circulars. Besides regular periodic health check-up, 20% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any.
- (ii) Personnel (including outsourcing employees) working in dusty areas shall wear protective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.
- (iii) Skill training as per safety norms specified by DGMS shall be provided to all workmen including the outsourcing employees to ensure high safety standards in mines.

(f) Ecosystem and biodiversity conservation

- (i) The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered flora/fauna, if any, spotted/reported in the study area. The Action plan in this regard, if any, shall be prepared and implemented in consultation with the State Forest and Wildlife Department.

(g) Public hearing, R&R and CSR

- (i) Implementation of the action plan on the issues raised during the public hearing shall be ensured. The project proponent shall undertake all the tasks/measures as per the action plan submitted with budgetary provisions during the public hearing. Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.



(ii) The project proponent shall ensure the expenditure towards socio-economic development in and around the mine, in every financial year in pursuance of the Corporate Social Responsibility Policy as per provisions under Section 135 of the Companies Act, 2013.

(iii) The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.11 (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.

(iv) The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.

(h) Corporate environment responsibility

(i) The Company shall have a well laid down environment policy duly approved by Board of Directors. The environment policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions. Also, the company shall have a defined system of reporting of non-compliances/violations of environmental norms to the Board of Directors and/or shareholders/stakeholders.

(ii) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions should be displayed on website of the Company.

(iii) A separate environmental management cell both at the project and company headquarter level, with suitable qualified personnel shall be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.

(iv) Action plan for implementing EMP and environmental conditions shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.

(v) Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

(i) Statutory Obligations

(i) The environmental clearance shall be subject to orders of Hon'ble Supreme Court of India, Hon'ble High Court, NGT and any other Court of Law from time to time, and as applicable to the project.

(ii) This environmental clearance shall be subject to obtaining wildlife clearance, if applicable, from the Standing Committee of National Board for Wildlife.

(iii) The project proponent shall obtain Consent to Establish/Operate under the Air Act, 1981 and the Water Act, 1974 from the concerned State Pollution Control Board.

(iv) The project proponent shall obtain the necessary permission from the Central Ground Water Authority (CGWA).



(j) Monitoring of project

(i) Adequate ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely PM₁₀, PM_{2.5}, SO₂ and NO_x. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Online ambient air quality monitoring stations may also be installed in addition to the regular monitoring stations as per the requirement and/or in consultation with the SPCB. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc to be carried out at least once in six months.

(ii) The Ambient Air Quality monitoring in the core zone shall be carried out to ensure the Coal Industry Standards notified vide GSR 742 (E) dated 25.9.2000 and as amended from time to time by the Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly reported to the Ministry/Regional Office and to the CPCB/SPCB.

(iii) The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Coal Industry Standards vide GSR 742 (E) dated 25.9.2000 and as amended from time to time by the Central Pollution Control Board.

(iv) The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No. J-20012/1/2006-IA.11 (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.

(v) Regular monitoring of ground water level and quality shall be carried out in and around the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times a year i.e. pre-monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to Ministry of Environment, Forest and Climate Change/Regional Office.

(vi) Monitoring of water quality upstream and downstream of water bodies shall be carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and Climate Change/Regional Office.

(vii) The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental conditions to the Ministry of Environment, Forest and Climate Change/Regional Office. For half yearly monitoring reports, the data should be monitored for the period of April to September and October to March of the financial years.

(viii) The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data/information/monitoring reports.

(k) Miscellaneous

(i) Efforts should be made to reduce energy consumption by conservation, efficiency improvements and use of renewable energy.



- (ii) The project authorities shall inform to the Regional Office regarding commencement of mining operations.
- (iii) A copy of the environmental clearance shall be marked to concerned Panchayat. A copy of the same shall also be sent to the concerned State Pollution Control Board, Regional Office, District Industry Sector and Collector's Office/Tehsildar Office for information in public domain within 30 days.
- (iv) The EC shall be uploaded on the company's website. The compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in public domain.
- (v) The project authorities shall advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry at www.environmentclearance.nic.in and a copy of the same shall be forwarded to the Regional Office.
- (vi) The environmental statement for each financial year ending 31 March in Form-V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the Company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF&CC by e-mail. Concerns raised during public hearing
- (vii) The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India/High Courts and any other Court of Law relating to the subject matter.
5. The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during presentation to the EAC. All the commitments made on the issues raised during public hearing shall also be implemented in letter and spirit.
6. The proponent shall obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. The Ministry or any other competent authority may stipulate any further condition for environmental protection.
7. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
8. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.



9. The coal company/project proponent shall be liable to pay the compensation against the illegal mining, if any, and as raised by the respective State Governments at any point of time, in terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP (Civil) No.114/2014 in the matter of 'Common Cause Vs Union of India & others'.

10. The project proponent, without prejudice to this EC, shall be bound to comply with any other interpretation of the orders of Hon'ble Supreme Court also, in due course of time.

11. This EC supersedes the earlier EC granted vide letter No.J-11015/106/2009-IA.II(M) dated 15th July, 2009 for 2.5 MTPA capacity to Gondagaon OCP in a total area of 917 ha.

SK
14/3/2018

(S. K. Srivastava)
Scientist E

Copy to:

1. The Secretary, Ministry of Coal, Shastri Bhawan, New Delhi
2. The Principal Secretary, Department of Environment, Government of Maharashtra, 15th Floor, New Admn. Bldg, Madam Cama Road, Mumbai - 32
3. The APCCF, Ministry of Environment Forest and Climate Change, Regional Office (Western Central Zone), Ground Floor, East Wing, New Secretariat Building Civil Lines, Nagpur - 1
4. The Member Secretary, Maharashtra State Pollution Control Board, Kalapataru Point, 3rd & 4th Floors, Sion, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai - 2
5. The Member Secretary, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 32
6. The Member Secretary, Central Ground Water Authority, Ministry of Water Resources, Curzon Road Barracks, A-2, W-3 Kasturba Gandhi Marg, New Delhi
7. The District Collector, **Nagpur**, Government of Maharashtra
8. Monitoring File 9. Guard File 10. Record File 11. Notice Board

SK
14/3/2018

(S. K. Srivastava)
Scientist E

SUBMISSION OF
PUBLIC HEARING COMPLIANCE REPORT

DATED 26.04.2005

for

EXPANSION OF GONDEGAON EXTENSION OC COAL MINE PROJECT

(2.50 MTPA to 3.50 MTPA)

ENVIRONMENTAL CLEARANCE ISSUED BY MOEF &CC, NEW DELHI

(VIDE LETTER NO. J-11015/106/2009-IA-II(M) DATED 14.03.2018)

FROM MOEF&CC, NEW DELHI



WESTERN COALFIELDS LIMITED

(A Govt. of India Miniratna Company)

**OFFICE OF THE SUB AREA MANAGER, GONDEGAON SUB AREA
POST-GONDEGAON, TEH.-PARESHONI, DISTT.NAGPUR (M.S.)**

**Compliance Report of Minutes of Public Hearing held on
26.04.2005**

Time 11:30 AM

Venue: Bachat Sabhagriha Collectorate, Nagpur

Expansion of Gondegaon Extension OC Coal Mine Project.

LIST OF ENCLOSURES

Annexure	Documents	Page No.
I	Minutes of Public Hearing held on 26.04.2005	
II	Compliance of Minutes of Public Hearing held on 26.04.2005	
A	Pollution Control Measures at project	
B	Photos of site for rooftop rainwater harvesting Structure	
C	Details of year-wise plantation carried out	
D	CSR Activities carried out	
E	Employment and R&R Details of Mine	
F	Air and Water Quality Monitoring Report	

***Minutes of Public Hearing held on
26.04.2005 for Gondegaon OC
Project***

MINUTES OF PUBLIC HEARING

ANNEXURE-XI

Sub: - Public Hearing for Environmental clearance for Gondgaon Open Cast Extension, Western Coalfields Limited Tah: Parseoni, Dist: Nagpur, Maharashtra

Venue: Bachat Sabhagriha, Collectorate, Nagpur

Date: 26-04-2005

Time: 11.30 a.m.

The Environmental Public Hearing for Western Coalfields Limited, Gondgaon Open Cast Extension Mine was conducted on 26-04-2005 under the chairmanship of Hon'ble Additional District Collector, Nagpur. The advertisement for this public hearing was published in local newspapers as per the notification (Annexure-I)

- The Hitavada, Nagpur (English) dated 23-03-2005.
- Dainik Lokmat, Nagpur (Marathi) dated 23-03-2005.

The public hearing panel was formed, as per MPCB office order No.E-33 of 2005 vide letter No. BO/PO(P&P)/PH/B-1425 dated 19-03-2005. (Annexure-II)

The following members of the public hearing panel were present at the time of public hearing (Annexure-III).

1	Smt. Anshu Sinha, IAS, Additional District Collector, Nagpur	Chairman
2	Shri. Ajay Gulhane, Deputy Collector, Nagpur	Member
3	Representative of Geology & Mining Govt. of Maharashtra, Nagpur	Member
4	Shri V.M.Motghare, Regional Officer, MPCB, Nagpur	Member
5	Shri Udaybhan Yadav At.Gondgaon Ta.Parseoni Dist. Nagpur	Member
6	Shri Nathuji Tikle At.JunikampteeTa.Parseoni Dist. Nagpur	Member
7	Shri Tejram Sarile At.Ghatrohna Ta.Parseoni Dist. Nagpur	Member
8	Smt. Sulochanabai Kadnaike At.Gondgaon Ta.Parseoni Dist. Nagpur	Member
9	Shri Daulotrao Waghamare At.Gondgaon Ta.Parseoni Dist. Nagpur	Member
10	Shri A.J.Kude, Sub Regional Officer-I, MPCB Nagpur	Convener

2

Representatives of NGOs, Sarpanch of Villages, Agriculturists of affected area and representatives of project proponent were present in the public hearing. The attendance sheet is enclosed. (Annexure-IV)

Shri V.M. Motghare, Regional Officer, MPCB Nagpur welcomed all the members of public hearing panel, officials, NGOs, agriculturists, representatives of the project proponent and sought the permission from the Chairman to initiate the proceedings. He briefed the importance regarding the environmental clearance and public hearing procedures and advised all the people present in the public hearing to come with their views and comments on the project to ensure that the objectives of the public hearing are fulfilled.

Shri P.K. Gandhi, Senior Environment Engineer, WCL, Nagpur explained the details of the project including area covered under the project, capacity of coal production, details of mining, impact of dewatering on surrounding area and uses of mine water. He also mentioned details regarding various precautionary measures taken in the project to protect environment from water pollution, air pollution & noise pollution and community development activities initiated by the project proponent.

The Regional Officer, MPCB Nagpur asked the members, representatives of the NGOs, agriculturists present in the public hearing to submit their written and oral objections.

Shri. Siddhartha Gajbhiye, Grampanchayat Member Vill. Gondagaon Td. Parsooni, Dist.Nagpur enquired that.

1. When and on what date the Gondagaon Village will be rehabilitated?

Shri. Kishore Belsare, Chairman of Gondagaon Project Affected Committee has raised following points.

1. Land cost so far not paid till date to the land affected person.
2. As per old agreement WCL has to complete the old work on top priority.
3. Some persons of Vill. Gondagaon till date not got the job though their land is acquired by WCL.

Shri. Sarile, Sarpanch Grampanchayat, Ghatrohana, Tq. Parseoni, Dist. Nagpur has raised the following points.

1. As the Gondagaon extension mine comes in the vicinity of Ghatrohana Village the land is to be acquired from Ghatrohana Village & thus land compensation as per the rules shall also be applicable to the Ghatrohana Villagers & Job preference shall also be extended to land affected persons.

Shri. Shivkumar Yadav, Member of Rehabilitation Committee of Gondagaon also raised the objection as mentioned above. He has pointed out that there is depletion of groundwater level due to mining activities.

The representative from WCL explained that the Air & Water pollution control measures are the basic parts of the mining activities & WCL authorities has clarified the issue & following commitments are given.

1. The Gondagaon Village is to be shifted within 2 years from the date of Public Hearing taking into the confidence of local village panchayat & in consultation with District Administration.
2. Land compensation and jobs will be as per the coal India & WCL rules.
3. Comprehensive study on depletion of ground water with CGWB due to mining activities is in advance stage & which will be completed within one year & the recommendation issued by CGWB will be strictly followed by WCL.

4. Mobile water tankers have been put into use for water sprinkling on haul road and coal transportation road & all drills are fitted with dust extractors
5. All Coal transportation road will have been black topped & water sprinkling arrangements will be installed.
6. Tree Plantation will be carried out Around CHP, Village boundary, along road and on over burden dumps etc.
7. Covering of coal transportation trucks by tarpaulin for all sides.
8. Sweeping /brooming of coal transportation road is also done regularly
9. Control blasting system is to be adopted with regular measurement through vibrometer & results shall be communicated to Local Grampanchayat & Pollution Control Board.
10. Kachha pond with proper drain is to be made for irrigation purposes to utilize water in proper way.

Chairman of the panel has directed WCL authority that the community development programme shall be taken exclusively by WCL from their own resources.

In light of the observations and considering the representations given by the villagers the Public Hearing Panel is of view that.

1. WCL shall carry out massive tree plantation especially between the roads leading to villages & mine, OB dumps and avenue plantation outside their area which will be helpful in maintaining ecological balance
2. WCL shall provide adequate fixed water sprinklers at CHPs, Coal transportation roads, weigh bridge, haul roads etc. to control fugitive dust emission

3. WCL shall ensure that, all the trucks carrying coal shall be covered with tarpaulins properly to avoid spillage of coal on the roads and overloading of coal shall be strictly avoided
4. WCL shall take care to avoid flood type situation in the adjoining villages due to overburden & suitable structure shall be provided to avoid the damage.
5. WCL shall take massive ground water table recharging works and effective utilization of mine water discharge for irrigation use at nearby villages. WCL shall also ensure that scarcity of water due to depletion of ground water level due to mining activities & they shall supply water to the affected villages.
6. WCL shall maintain overburden dumps to avoid nuisance to villages and carry out massive tree plantation on over burden & suitable structure shall be provided to avoid the damage.
7. WCL shall carry out blasting in the day time only using advanced technology to avoid ill effects due to blasting to nearby residents WCL shall also maintain the record of blasting using vibrometer.
8. WCL shall install continuous ambient air monitoring stations in the vicinity of the mines and adjoining villages.
9. WCL shall immediately initiate mass community development programmes in the vicinity of the affected villages in consultation with District administration, MPCB and local body and submit the yearly proposal for approval of the District administration

10. WCL should implement, above recommendations as suggested by the public hearing panel on priority basis.

The recommendation of the Chairman of the public hearing panel and Additional District Collector Nagpur is as below.

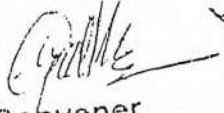
In view of the opinion of public hearing committee & representations made by villagers, WCL should initiate the action on following points.

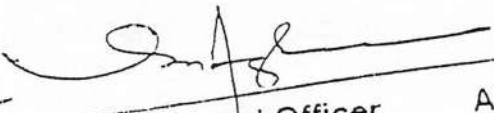
1. As recommended by the pollution control board, WCL shall take measures to control air, soil & water pollution to maintain ecological balance and environmental degradation, in surrounding area.
2. Due to mining water table in adjoining areas go down. WCL shall take exhaustive ground water recharging works for recuperation of ground water level and supply to the affected villages during scarcity of water.
3. To maintain ecological balance in the surrounding area WCL shall carry out massive tree plantation in open areas as well as avenue plantation on public roads.
4. As per the representation of the villages WCL shall take a repairing / tarring of roads where trucks are passing.
5. WCL Shall examine the representation submitted by Sarpanch to carry out social development works in affected villages in consultation with District administration.
6. It is recommended that the matter related to acquisition of land, employment if any should be done on priority basis.

7. The continuous Ambient Air quality monitoring station shall be installed in the mine premises & results shall be displayed at local panchayat & Maharashtra Pollution Control Board.

In the light of above facts, it is recommended that, WCL authorities carry out mass awareness programme & its implementation within a stipulated time of next six months. Conditional clearance granted subject to fulfillment of commitments of WCL & directions given in this regard within the stipulated time period. The provision of "Rejection of Clearance" should be incorporated in conditional permission if WCL authorities fail to redress the grievances within a period of six months.

Convener of the public hearing panel thanked the Chairman, Members of the panel, local people present during the public hearing


Convener
Sub Regional Officer-I
MPCB Nagpur


Regional Officer
MPCB Nagpur


Additional District Collector,
Nagpur &
Chairman of the
Public Hearing Panel

MAHARASHTRA POLLUTION CONTROL BOARD

Phone : 4010437 / 4014701 / 402
Fax : 4024068 / 4023516
Website : <http://mpcb.mah.nic.in>
E-Mail: mpcbslon@bom.nic.in



KALPATARU POINT, 3rd Floor
Slon-Matunga Scheme Road No.8,
Opp. Slon Circle, Slon (East)
Mumbai-400 022

NO.BO/PO(P&P)/PH/B-1426

Date : 19 / 03 / 2005.

OFFICE ORDER NO. 5-33 OF 2005.

In compliance of Notification No.318(E), dated 10-04-1997 & circular dtd. 12/02/2002 of Ministry of Environment and Forests, Government of India, the Public Hearing Panel for the proposed project, of M/s. Western Coalfields Ltd., Gondagaon Extension Opencast Mine, Tq. Parseoni, Dist-Nagpur is as follows :-

1)	District Collector, Nagpur. Dist.Nagpur.	Chairman
2)	Representative of Environment Department, Government of Maharashtra, Mumbai.	Member
3)	Representative of Geology & Mining Government of Maharashtra, Nagpur.	Member
4)	Regional Officer, MPCB, Nagpur.	Member

SENIOR CITIZENS :

5)	Shri. Udaybhan Yadav, At. Gondagaon, Tq. Parseoni, Dist-Nagpur.	Member
6)	Shri. Ramprit Prasad, At. Gondagaon, Tq. Parseoni, Dist-Nagpur.	Member
7)	Shri. Natthuji Tikle, At. Juni Kamptee, Tq. Parseoni, Dist-Nagpur.	Member

LOCAL BODY REPRESENTATIVES :

8)	Shri. Tejram Sarile, Sarpanch Ghatrihana, Tq. Parseoni, Dist.Nagpur.	Member

P.T.O.

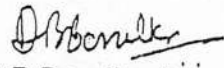
: 2 :

9)	Smt. Sulochanabai Kadnaik, Sarpanch , Gondegaon, Tq.Parseoni, Dist.Nagpur.	Member
10)	Shri. Daulatrao Waghmare Upsarpanch, Juni-Kamptee, Tq.Parseoni, Dist.Nagpur.	Member

Sub-Regional Officer-I, M.P.C.Board, Nagpur , will work as a Co-ordinator/Convener

The Public Hearing will be held on 26/04/2005 at 11.00 hrs. at Bachat Sabhagrih,
Collector Office, Nagpur.

The members are requested to make it convenient to attend the Public Hearing.


(D.B.Boralkar)
Member Secretary

Copy for information to :

- 1) The Secretary Environment Department , Govt.of Maharashtra.
Mantralaya, Mumbai-400032.
- 2) The Chairman, M.P.C.Board, Mumbai.
- 3) Representative of Geology & Mining, Govt. Of Maharashtra, Nagpur.

Copy for information to :

- 1) District Collector, Nagpur.
- 2) Members of Public Hearing Panel.
- 3) M/s. Western Coalfields Ltd., Gondegaon Extension Opencast Mine, Tq. Parseoni,
Dist-Nagpur

Copy for information & necessary action to :

- 1) Regional Officer, MPCB, Nagpur.
- 2) Sub-Regional Officer-I, MPCB, Nagpur.

મે. કલુ. સી. મુલ ગોડે ગોળ મુલસેવસન. કોલેજ નામ નો
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 નામ નોલેવસન નામ નોલેવસન નામોર ગોડે ગોળ મુલસેવસન
 નામ નોલેવસન નામોર ગોડે ગોળ મુલસેવસન

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૨)	મા. નોલેવસન ગોડે ગોળ મુલસેવસન	૨૦/૧૧	મા. નોલેવસન ગોડે ગોળ મુલસેવસન
૩)	મા. નોલેવસન ગોડે ગોળ મુલસેવસન	૩૦/૧૧	મા. નોલેવસન ગોડે ગોળ મુલસેવસન
૪)	મા. નોલેવસન ગોડે ગોળ મુલસેવસન	૪૦/૧૧	મા. નોલેવસન ગોડે ગોળ મુલસેવસન
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૭)	મા. નોલેવસન ગોડે ગોળ મુલસેવસન	૭૦/૧૧	મા. નોલેવસન ગોડે ગોળ મુલસેવસન
૮)	મા. નોલેવસન ગોડે ગોળ મુલસેવસન	૮૦/૧૧	મા. નોલેવસન ગોડે ગોળ મુલસેવસન

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80	श्रीमती सुबोधकाश्री गोडगाई अ.प. गोडगांव, ता. पारमिणी जिला नागपुर	सदस्य गोडगांव	श्री सुबोधकाश्री गोडगांव गोडगांव
81	श्री जयलक्ष्मी काशी अ.प. गोडगांव, ता. पारमिणी जिला नागपुर	सदस्य	
82	श्री प्रभाकर गोडगांव पूर्ववर्ग समिती सदस्य गोडगांव ता. पारमिणी जिला नागपुर		गोडगांव
91	श्री जयलक्ष्मी काशी पूर्ववर्ग समिती सदस्य गोडगांव ता. पारमिणी जिला नागपुर		गोडगांव 26/6/09
92	श्री भागीरथ नाईकु गोडगांव		गोडगांव
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44	જાનકરાવ દેવિલાલ ડાટા	દિગરા (દાખલા)	જાનકરાવ
50	કુમળોનામ મુલ દિવેલ	— 11 —	— 11 —
51	દેવોજી શાહજી પિત્રાલ	— 11 —	દેવોજી
52	શુભકાંત વોશી વારદા	બિના	શુભકાંત
53	માડરા દોડરા	દિગરા	માડરા
54	ભાઈ દોડ દિગરા (દાખલા)	દિગરા	દિગરા
55	જી. જી. જી. જી. જી.	14. 8-	જી. જી. જી.
56	જીવાલ રાઠા મુ ગોડગાવ	બિના	જીવાલ
57	પરિવર શામળ સિલ્લા	બિના	પરિવર
58	શામળ	ગોડગાવ	શામળ
59	પંકજ સારંગી ગોડગાવ	ગોડગાવ	પંકજ
60	દેવિલાલ શામળા શોભાલ	- 11 -	દેવિલાલ
61	R. G. L. L. L.	Grandson of	Grandson of
62	D. S. J. J. J.	1000 / 1000000	1000 / 1000000
63	દાદાજીજીજી પાટીલ કપસરપંચ	દાદાજીજી	દાદાજીજી
64	જેશવરાવ ગોડગાવ ગોડગાવ	ગોડગાવ	જેશવરાવ
65	જી. જી. ગોડગાવ ગોડગાવ	ગોડગાવ	જી. જી. ગોડગાવ
66	જી. જી. ગોડગાવ ગોડગાવ	ગોડગાવ	જી. જી. ગોડગાવ

***Compliances of Minutes of Public
Hearing held on 26.04.2005 for
Gondegaon OC Project***

**Compliance Status as on 18.08.2018 of Minutes of Public
Hearing held on 26.04.2005
Time 11:30 AM
Venue: Bachat Sabhagriha Collectorate, Nagpur**

Acid mine discharge is due to presence of Pyrite bands along the coal seams and it is not present in all the coal mines. In the above said study area's geological formation does not have pyrite bands none of the coal mines are acidic in nature.

- **Industrial Effluent & Mine water**

ETPs of sufficient capacity with oil skimmer/ (O&G Trap) has been installed near the washing ramp of the workshops where the discharged water is being properly treated for having a zero discharged system. The ETP sludge is being treated properly at CHWTDFS, Butibori before final disposal.

S.No	Name of Mine	Existing ETP
1	Gondegaon OC	1 No. ETP of 100 KLD capacity

- **Surface runoff of sediments/soil from OB/Mines.**

Adequate numbers of vegetation are grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it also reduces surface run-off, which helps averting siltation of Natural watercourses.

In the said opencast projects, to arrest the silt, Catch drains with sufficient length & breadth dimensions have been constructed around the OB dumps. The same is regularly de-silted and maintained properly. Garland drains are also provided around the quarries.

Catch drains are provided around the OB dumps to collect the run off & silt during peak rainfall. In OB benches, cross drains are provided which collect all silt & run off to the mine sump having sufficient capacity to deal with peak rainfall. These mine pumps provide sufficient settling time for suspended particles. As expansion project shall commence, the Garland drain/catch drain shall be extended suitably.

Embankments of minimum 6 meters height above HFL on the river side are constructed and strengthened by plantation and stone pitching (wherever necessary) on the sides.

- **Regular monitoring**

Monitoring of Environmental Attributes is being carried out at effluent points of sedimentation tanks & workshop ETPs for monitoring of water quality and for further strengthening/ augmentation of additional measures if needed.

Soil Pollution Control Measures

Top soil is stacked separately at an earmarked area, similarly OB dumps are being stacked at an earmarked areas only as per the stage wise reclamation plan & plantation programme, mine closure plan, By the end of mine life, technical reclamation & biological reclamation will be carried out.

Recently Plantation of 30,000 nos. is done on OB Dump and slope by MPRVVN Ltd. to maintain stability of the OB dump and top soil. Regarding monitoring of reclaimed areas it may be mentioned here that, plantation is done by expert agencies which includes, plantation along with 3/5 years maintenance. Status of reclamation will submitted to RO, MoEF & CC along with EC compliance report

(Photos of Control Measures enclosed as Annexure-A)

**Compliance Status as on 18.08.2018 of Minutes of Public
Hearing held on 26.04.2005
Time 11:30 AM
Venue: Bachat Sabhagriha Collectorate, Nagpur**

2	Recommendation : Due to mining water table in adjoining areas go down WCL shall take exhaustive ground water recharging works for recuperation of ground water level and supply to the affected villages during scarcity of water Compliance status: WCL has taken several measures and continuously taking steps ground water recharging works for recuperation of ground water level and supply to the affected villages. The details of such initiatives are placed below: Regarding rainwater harvesting it may be mentioned here that, the leftover mine voids after life of mine will act as water body & rainwater harvesting structures helping in water conservation & in improving groundwater levels. Recently, a Work order for installation of Rooftop Rainwater harvesting system at Gondegaon Transit hostel building and dispensary has been awarded vide ref no. WCL/GM/NGP/C6/1468 dated 19.03.2008 and work is in progress. (Photos of site enclosed <i>as Annexure B</i>) Additionally, pond of 382.50 m³ size provided for the collection of rain water near Yeshamba village In general, at present, the excess treated mine pumped out water discharged to local streams/ nullah is being used by the neighboring community. Out of the total quantity of mine pumped out water of 32688 cubic meter per day, within the mine for various purposes about 5000 cubic metre per day is used. The balance quantity is being supplied to the local/ neighboring community for drinking, domestic & irrigation purposes In this regard, WCL has signed an MoU with Maharashtra Govt. to provide 10.76 Million M³/ year water from the OC mines to Thermal Power Plants and Signed an MoU with VIDC (Vidharba Irrigation Development Corporation) for providing water 28.16 Million M³/year for irrigation purposes from the mines of Nagpur Area of WCL. Additionally, proposals for i) Installation of RO Plant for drinking water – 100 cubic metre per day & ii) Installation of Pressure Filter Plant for drinking water – 630 cubic metre per day are under consideration.
3	Recommendation : To maintain ecological balance in the surrounding area WCL shall carry out massive tree plantation in open areas as well as avenue plantation on public roads. Compliance status: WCL has taken several measures to maintain ecological balance in the surrounding areas by carrying out massive plantation in open areas as well as avenue plantation on public roads. Details of such measures are mentioned below: Till date 3,93,905 nos. of saplings comprising of mixture of native species are planted in the project area covering an area of 128.20 ha and as per the approved EMP, by the end of the mine life an area of 255 ha will be reclaimed biologically. Apart from regular plantation, avenue plantation along the coal transportation road of 8.6 km (approx.) was done. (For detailed yearwise plantation copy enclosed as <i>Annexure-c</i>)

**Compliance Status as on 18.08.2018 of Minutes of Public
Hearing held on 26.04.2005
Time 11:30 AM
Venue: Bachat Sabhagriha Collectorate, Nagpur**

4	Recommendation : As per the representation of the villages WCL shall take a repairing tarring of roads where trucks are passing Compliance status: WCL has taken several initiatives/measures for tarring of roads where trucks are passing. Coal is transported along black topped avenue planted coal transportation road of 8.6 km (approx.) as per the provisions & route of approved mining plan. Along with this as a CSR initiative, company is regularly working in the maintenance and construction of roads at nearby areas for easing the transportation of local people Some of the Initiatives are mentioned below:		
	2013-14	Yesamba village/ Wagholi village	Repairing of damaged Tar road from village Yesamba to Village Wagholi under Gondegaon SA.(Approx. Length 3.00 Km)
	2012-13	Warada Village	Construction of cement concrete road (400mx3m) at village Warada near Gondegaon.
	2012-13	Ghat rohna to Juni Kamptee	Making balance concrete pavement from Ghatrohna to Juni Kamptee (300 Mtrs.)
	2012-13	Rohna village	Construction of cement concrete road at Rohna Village under GSA.
	2011-12	Yesamba village	Providing concrete pavement at Main road at Yesamba village, Tah: Parseoni(200MX3.7M)
	2010-11	Warada Village	Repair of balance approach road from Yashamba to Warada Village under GSA. (Spill Over 2009-10)
	2010-11	Ghat Rohna village	Construction of cement concrete road from Juni Kamptee to Ghat Rohna Village under GSA.
	2010-11	Tekadi village	Repairing of approach road from Tekadi Village upto NH-7 under GSA.
5	Recommendation: WCL Shall examine the representation submitted by Sarpanch to carry out social development works in affected villages in consultation with District administration.		
	Compliance status: As per the CIL's CSR policy under Companies Act, 2013, The fund for the CSR will be allocated based on 2% of the average net profit of the Company for the three immediate preceding financial years or Rs 2.00 per Tonne of Coal Production of the previous year whichever is higher. In relation to this, WCL has carried out various social development works in affected villages and nearby areas in consultation with Sarpanch and District Administration. CSR fund allocated utilized towards socio economic development of villages neighbouring the project within 25 km range. (Details of CSR activities is enclosed as <i>Annexure-D</i>)		

**Compliance Status as on 18.08.2018 of Minutes of Public
Hearing held on 26.04.2005
Time 11:30 AM
Venue: Bachat Sabhagriha Collectorate, Nagpur**

6	Recommendation: It is recommended that the matter related to acquisition of land, employment if any should be done on priority basis. Compliance status: All the matters related to acquisition of land, employment are done on priority basis as per <i>Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (also Land Acquisition Act, 2013)</i> and lays down the procedure and rules for granting compensation, rehabilitation and resettlement to the affected persons. In this regards Company has provisions to provide fair compensation to those whose lands are taken away, bring transparency to the acquisition of land or buildings, infrastructural projects ensures rehabilitation to those affected. State shall pay compensation for the land as per the market price for land, building or acquired structure. WCL ensures the following points while implementing: • To ensure, in consultation with institutions of local self-government and Gram Sabhas, a participative, informed and transparent process for land acquisition, development of essential infrastructural facilities and urbanisation with the least disturbance to the owners of the land and other affected families. • Provide just and fair compensation to the affected families whose land has been acquired or proposed to be acquired or are affected by such acquisition • Make adequate provisions for such affected persons for their rehabilitation and resettlement. • Ensure that the cumulative outcome of compulsory acquisition should be that affected persons become partners in development leading to an improvement in their post-acquisition social and economic status. As on date 01/08/2018, Total Land holding of Gondagaon is 821.94 Ha out of proposed 845.74 Ha and as per <i>Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (Land Acquisition Act, 2013)</i> employment given to 422 nos. of persons and monetary compensation given to 15 persons till date, as a compensation to those families whose land has been acquired or proposed to be acquired or are affected by such acquisition. Amount paid to PAPs towards Land during 2013-14 to 2017-18 is Rs. 7,38,69,664.00 to ensure development of essential infrastructural facilities and urbanization to those affected. (Details of land acquisition and R&R activities is enclosed as <i>Annexure-E</i>).
7	Recommendation: The continuous Ambient Air quality monitoring station shall be installed in the mine premises & results shall be displayed at local panchayat & Maharashtra Pollution Control Board. Compliance status: Regarding environmental monitoring, it may be mentioned here that, ambient air quality is being monitored every fortnight at 4 locations (including core & buffer zones) by CMPDI Ltd. and most of the time, air quality conforms to the standards prescribed and the same reports are submitted to RO, MoEF & CC and SPCBs on regular basis and results are displayed on company website regularly. (Copy of Monitoring report enclosed as <i>Annexure F</i>) WCL has initiated the proposal for the work of CAAQMS at Gondagaon OC Project. In this regard, it may be mentioned that the provision of online continuously Ambient Air quality monitoring station at one location will be installed after due consultation with MPCB. The appropriate financial provision has been made in the Approved Project Report. Result will be displayed at local panchayat & Maharashtra Pollution Control Board.

*Photos of Pollution Control
Measures at
Expansion of Gondegaon
Extension OC project*

List of Pollution Control Measures with Photographs at Expansion of Gondegaon Ext. OC Coal Mine Project of Nagpur Area, WCL

Air Pollution Control

1. Three nos. of mobile water tankers with mist sprinkling system of capacity of 28 KL, and two nos. of 12 KL & 8 KL are deployed for the water spraying to achieve the effective dust suppression on coal transportation roads, haul road & near coal stock yard.







Photo: Showing water spraying on coal transportation road for dust suppression.

2. 25 nos. of the fixed sprinklers are installed over the conveyor belt, hopper, weighbridge, coal stockyard and along the coal transportation road.





3. In order to achieve the minimum dust generation, all Coal Carrying trucks are properly covered by Tarpaulin to minimize the fugitive dust emission (arise due to coal spillage) and trucks are being monitored through CCTVs cameras & GPS system for the compliance and to ensure minimum coal dust emission.



4. To minimize the dust generation during coal transportation the roads has been black topped along with a 3-tier bamboo plantation. Total length of the internal black topped road is around 2.8 Km (Black topped road 8.6 km & concrete Road is 0.80 km).



Pic: showing Black topped road (length 8.6 Km)

5. To minimize the air pollution control both of the CHP are fully covered by side cladding



Pic: CHP side cladding

6. Manual Road Sweeping is done in routine along the road side for maintaining Cleaning & brooming at the project and also a brooming machine of around 46 lakhs from Eicher has also been deployed for the routine brooming and cleaning at Coal transportation Coal.



Pic: Showing Automatic brooming machine

7. All the operating vehicles are certified by PUC to control pollution



8. To reduce electricity consumption LED lights have been installed in all offices & residential Colony.

9. To reduce air pollution in colony area, the all workers have facilitated with LPG cylinders by management. No Coal is issued to workers for domestic purpose.

10. Four number of AAQ monitoring stations have been established for regular monitoring (TPM, PM 10, PM 2.5, SO₂, NO_x) of the ambient air quality and water also. The monitoring is done by Central Mine Planning and Design Institute, Regional Institute no-IV, Nagpur-A NABL Accredited Lab on fortnight basis. And reports are regularly being submitted to MOEF&CC, New Delhi & Regional Office also.

Plantation:

A total of 3,93,905 nos. (128.2 Ha) of the saplings having species of neem, karanja, gulmohar, teek, sisoo & bamboo etc. have been planted at vacant places, OB dumps, near CHP, in between Gondegaon village and OB dump, along coal transportation road and also in the Gondegaon project residential colony.





Pics: Showing Tree Plantation

Water Pollution Control Measures:

1. First, the raw mine discharged water is collected in a Central quarry, which function like a sump, where the coal particles (if any), are being settled down and then after the water is pumped out for further treatment through sedimentation ponds before discharging to the kanhan river.



Photo: A general view of the Central quarry

2. Two nos. of the sedimentation ponds (One sedimentation pond with baffles wall having size of 58x18x1.5 mtrs.) & one Kutcha Sedimentation pond having almost double size of the previous one respectively has been constructed for primary filtration / sedimentation of the mine discharged water.



3. ETP having a capacity of 100 KLD with oil skimmer has been installed near the washing ramp of the workshop where the discharged water is being properly treated for having a zero discharged system. The ETP sludge is being treated properly at CHWTDFS, Butibori before final disposal.





ETP (100 KLD) at Gondegaon OCM

*Photos of site proposed for
Rainwater harvesting Structure*

PHOTOS OF SITE FOR RAINWATER HARVESTING STRUCTURE



EXECUTIVE TRANSIT HOSTEL AT GONDEGAON

PHOTOS OF SITE FOR RAINWATER HARVESTING STRUCTURE



EXECUTIVE TRANSIT HOSTEL AT GONDEGAON

*Year-wise details of plantation
done at Gondegaon*

DETAILS OF YEARWISE PLANTATION DONE AT GONDEGAON BY WCL

SL NO	PLANTATION SITE	AREA PLANTED (HA)	SPECIES PLANTED	NO OF PLANTS	YEAR OF PLANTATION	AGENCY
1	On Embankment , Near CHP, substation	8.80	Neem, Teak, Sisoo, Karanj,	40,000	1996-97	Pvt. Party
2	Road to Project Office	3.50	Rain Tree, Jamun,	16,000	1997-98	FDCM Nagpur
3	Colony Road	16.30	Avanla, Cssia, Imli,	73,500	1998-99	FDCM Nagpur
4	Colony Road	4.10	Shivan, Subabul,	18,500	1999-00	FDCM Nagpur
5	Colony Road near OB dump	2.00	Gulmohar, Peltaphorou m etc	5,000	2001-02	FDCM Nagpur
6	Between OB dump and Village	27.20		68,000	2002-03	FDCM Nagpur
7	Near OB dump along CHP	20.00		50,000	2003-04	MPRVVN
8	Colony	12.00		30,000	2004-05	FDCM Nagpur
9	Near Village and WCL colony	20.00		52,000	2005-06	MPRVVN
10	Coal Transportation Road	4.00		9,805	2010-11	FDCM Nagpur
11	Rehabilitation Site			1,100	2012-13	Pvt. Party
12	OB dump	10.3		30,000	2016-17	MPRVVN
TOTAL PLANTATION		128.20 Ha		3,93,905 nos.		

***CSR Activities carried out at
Gondegaon by WCL***

CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2013-14				
			INFRASTRUCTURE	
19	2013-14	Yesamba village/ Wagholi village	Repairing of damaged Tar road from village Yesamba to Village Wagholi under Gondegaon SA.(Approx. Length 3.00 Km)	41.43
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2013-14				
20	2013-14	Parseoni Tahsil	Sponsoring of promotional activity of tribal community and culture residing in and around Parseoni Tahsil under CSR activity.	2.00
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2014-15				
21	2014-15	Warada village	Providing financial assistance to farmer of Warada village under GSA.	8.08
22	2014-15	Gondegaon & Tekadi village	Assistance to farmers of Gondegaon village and Tekadi village under CSR.	8.19
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2015-16				
23	2015-16		Jalyukta Shivar Abhiyan under CSR.	24.00
24	2015-16		Installation and commissioning of 1 no. of pressure sand water filter including making of 2 nos. ground water sump at Kanhan- Pipri	47.02
25	2015-16		Construction of body over chassis of hearse van	
26	2015-16		Skill development training to PAPs	24.00
27	2015-16		Welfare Plan tribal	2.00
28	2015-16		Community Development expn.	0.52
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2016-17				
29	2016-17		Misc. work for the safety & security of water treatment plant at Kanhan	7.44
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2017-18				
30	2016-17		Organised inter village sports like Kabaddi football etc in different villages of Area	0.35
31	2016-17		Providing Canon printer to adarsh High School, Kanhan	0.11
32	2016-17		Organised inter village sports like Kabaddi football etc in different villages of Area	0.25
33	2016-17		Supply of books for library at Dharmnagar under Nagar Parishad Kanhan-Pipri	1.06
34	2016-17		Supply of LCD Projector to Adarsh High School, Suresh Nagar Kanhan	0.24
35	2016-17		Providing sound system to Adarsh high school, Kanhan	0.17
36	2016-17		Provision for Swaccha Bharat Pankhwada	1.56

***Employment given to PAP against
Land in 2017-18***

R&R DETAILS OF MINE

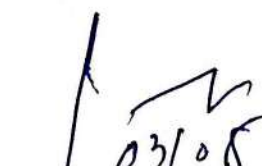
Gondegaon Extension OC Coal Mine Expn. Project.

	R & R Proposed	Status as on 01.08.2018
Total Land Holding	845.74 Ha.	821.94 Ha.
Employment	---	Employment given 422 Land Losers (Balance Employment ----)
Monetary Compensation (MC)	---	MC given to 15 Land Losers (Balance Employment ---)

R & R DETAILS OF HOUSE OUSTEES

	Status as on 01.08.2018
Total House Oustees	701


Dy. Manager (Survey)
Gondegaon OC Mine


Nodal Officer (Envnt.)
Gondegaon OC Mine


G.M. (Min.)/SAM
Gondegaon Sub Area

Rehabilitation activates done by WCL at Gondegaon

Sl.No	Activity	Amount (in Lakhs)
1	Construction of Bus Stop / waiting shed	1.54
2	Construction of Market Place.	4.99
3	Construction Of Play ground	6.38
4	Construction Of 01 No. Balwadi	2.07
5	Construction Of Primary & Upper Primary school.	45.14
6	Construction Of Panchayat Bhavan.	10.82
7	Construction of Open wall 4.5 m dia & 20 mtr depth.	7.57
8	Design construction & Commission of R.C.C.O.M. Tank.	32.90
9	Tube well with submersible pump.	10.66
10	Hand pump 03 Nos.	1.10
11	Providing & laying G.I. Main & distribution pipe line.	28.98
12	Construction Of community Hall.	7.81
13	Pond.	4.40
14	Construction of road, RCC culvert/RCC drain crossings and RCC drains.	449.75
15	Marking plots with cement concrete pillar & misc. civil work.	2.91
16	Repairing of damaged water supply pipe line additional road, culverts and drain.	17.70
17	Construction of Catal shed (100 No) at Rehabilitation of GSA.	7.97
18	Construction of chain link fencing and grave yard Rehabilitation site of GSA	4.91
19	Construction of Anganwadi and extension of existing old bldg at Rehabilitation under GSA.	10.54
20	Filling of earth at fowling plot area of Rehabilitation site under GSA.	38.64
21	Construction of Primary Health Centre at Rehabilitation site under GSA.	13.80
22	Repairing distempering, snowcem to school building, Gram Panchayat Community Centre at Rehabilitation site under Gondegaon Sub Area.	7.21
23	Making 02(Two) nos. 200 mm dia. Tube well with 5 Hp Submersible Pump at Gondegaon Rehabilitation site under Gondegaon Sub Area Nagpur Area	11.26
24	Construction of Black topping of road Gondegaon Rehabilitation site under GSA.	156.24
25	Construction of cremation shed and shok sabha hall at rehab. site under GSA.	16.05
26	Construction of post office building at Rehabilitation site under GSA.	6.00
27	Electrification of Internal road.	15.00
28	Construction of Bank building at Rehab site.	8.00
29	Estimate for development of garden at Rehab site.	5.00
	Total (Rs. In Lakhs)	939.95 Lakhs

Rehabilitation activates done by WCL at Gondegaon

***AIR AND WATER QUALITY
MONITORING REPORT
FOR THE JUNE'2018***

**STRICTLY RESTRICTED
FOR COMPANY USE ONLY**

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

**ENVIRONMENTAL MONITORING REPORT
GONDEGAON EXTN. OC**

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2018

Environment Laboratory
NABL Accredited vide Cert. No. T-2969

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 47⁰C in summer. In winter temperature is ranging about 22⁰C. 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.	Near Substation	- NGOA-1
2.	Near GhatRohna	- NGOA-2
3.	Gondegaon village	- NGOA-3
4.	Guest house/Filter Plant	- 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	- 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 : Day time and Night time Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102

Test Report NO : RIN/TR/JUNE-18/A-3 Date of Issue : 30/07/2018
 Name of the Customer: Env.CMPDI,Nagpur Sampling method : IS-5182
 Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19 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 : 2018
 NAME OF THE AREA : NAGPUR MONTH : JUNE.
 NAME OF THE PROJECT : GONDEGAON OC

Colony/ Guest house					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	NOx	SOX	PM-2.5
05/06/2018	152	84	5	19	45
22/06/2018	187	92	8	20	53
Permissible Limits	200	100	80	80	60
Ghatrohna village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	NOx	SOX	PM-2.5
05/06/2018	130	80	5	22	25
22/06/2018	173	89	7	15	-
Permissible Limits	200	100	80	80	60
Gondegaon village school					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	Nox	SOX	PM-2.5
06/06/2018	85	18	5	21	55
21/06/2018	70	37	6	10	-
Permissible Limits	200	100	80	80	60

Near Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	NOx	SOX	PM-2.5
05/06/2018	415	280	15	19	60
22/06/2018	292	137	12	18	59
TLV as per Env.(Protection) Amendment Rule 2000	600	300	120	120	60

- Above Std. value.

(Scientific Assistant)

Deepanshu Sahu
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102

Test Report NO : RIN/TR/JUNE-18/W-3 Date of Issue : 30/07/2018
Name of the Customer: Env.CMPDI,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 MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2018
NAME OF THE AREA : NAGPUR MONTH JUNE..
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
05/06/2018	7.12	24	18	<2
21/06/2018	6.94	28	18	<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
05/06/2018	7.43	28	16	<2
21/06/2018	7.72	24	16	<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	

Test Report No. : RIN/TR/JUNE-18/W-3a Date of Issue: 30.07.2018
 Name of the Customer : Env.,CMPDI,Nagpur Sampling method: By the party
 Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19
 Sample Description : Water sample No. of pages: 2
 Test Required : IS 10500:2012

NAME OF THE COMPANY : WCL YEAR : 2018
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : GONDEGAON OC Sampling Date : 14/06/2018
 NAME OF LOCATION : Mine water Discharge- (Main) -A

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	0.2	8.14	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	236	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	0.142	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	34	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	0.68	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	330	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	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	0.23	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	27	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/JUNE-18/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	0.006	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	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	0.03	<0.03	0.1	0.2
27	TSS- mg/l	IS 3025 (Part 17) : 1984, Gravimetric	25	46	****	
28	B.O.D.-mg/l (3 days at 27°C)	IS 3025 (Part 44) : 1993, (3 days incubation at 27°C)	2.0	4.2	****	

**** - Parameters not under IS : 10500

(Scientific Assistant)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	

Test Report No. : RIN/TR/JUNE-18/W-3b Date of Issue: 30.07.2018
 Name of the Customer : Env.,CMPDI,Nagpur Sampling method: By the party
 Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19
 Sample Description : Water sample No. of pages: 2
 Test Required : IS 10500:2012

NAME OF THE COMPANY : WCL YEAR : 2018
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : GONDEGAON OC Sampling Date : 14/06/2018
 NAME OF LOCATION : Mine water Discharge- (Near) B

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	4	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	4	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	7.32	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	0.215	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	0.07	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.63	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	335	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	44	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	21	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	39	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	13	45	No relaxation

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	180	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	0.03	<0.03	0.1	0.2
27	TSS- mg/l	IS 3025 (Part 17) : 1984, Gravimetric	25	60	****	
28	B.O.D.-mg/l (3 days at 27°C)	IS 3025 (Part 44) : 1993, (3 days incubation at 27°C)	2.0	6.0	****	

**** - Parameters not under IS : 10500

(Scientific Assistant)

**Deepanshu Sahu
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	

Test Report No. : RIN/TR/JUNE-18/W-3c Date of Issue: 30.07.2018
 Name of the Customer : Env.,CMPDI,Nagpur Sampling method: By the party
 Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19
 Sample Description : Water sample No. of pages: 2
 Test Required : IS 10500:2012

NAME OF THE COMPANY : WCL YEAR : 2018
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : GONDEGAON OC Sampling Date : 14/06/2018
 NAME OF LOCATION : River water u/s w.r.t Mine Discharge

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	4	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	4	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	7.10	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	148	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	0.242	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	0.08	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	320	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	36	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	0.04	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	69	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	10	45	No relaxation

Test Report No. RIN/TR/JUNE-18/W-3c

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	144	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	0.03	<0.03	0.1	0.2
27	TSS- mg/l	IS 3025 (Part 17) : 1984, Gravimetric	25	92	****	
28	B.O.D.-mg/l (3 days at 27°C)	IS 3025 (Part 44) : 1993, (3 days incubation at 27°C)	2.0	8.4	****	

**** - Parameters not under IS : 10500

(Scientific Assistant)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102

Test Report No. : RIN/TR/JUNE-18/W-3d Date of Issue: 30.07.2018
 Name of the Customer : Env.,CMPDI,Nagpur Sampling method: By the party
 Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19
 Sample Description : Water sample No. of pages: 2
 Test Required : IS 10500:2012

NAME OF THE COMPANY : WCL YEAR : 2018
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : GONDEGAON OC Sampling Date :14/06/2018
 NAME OF LOCATION : River water u/s w.r.t Mine Discharge

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	4	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	4	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	7.21	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	0.279	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	0.07	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.95	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	290	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	7	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	78	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	12	45	No relaxation

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	0.008	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	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	0.03	<0.03	0.1	0.2
27	TSS- mg/l	IS 3025 (Part 17) : 1984, Gravimetric	25	96	****	
28	B.O.D.-mg/l (3 days at 27°C)	IS 3025 (Part 44) : 1993, (3 days incubation at 27°C)	2.0	10.2	****	

**** - Parameters not under IS : 10500

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2018
NAME OF THE AREA : NAGPUR MONTH : JUNE.
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	Night Time
JUNE.2018	04/06/2018	64.3	65.7
JUNE.2018	22/06/2018	65.1	63.9
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : COLONY- NGON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2018	04/06/2018	42.6	41.7
JUNE.2018	22/06/2018	44.2	41.8
Permissible Limit		55	45

Name of the Location : Ghatrohna Village- NGON-3

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2018	04/06/2018	43.7	42.6
JUNE.2018	22/06/2018	42.8	41.2
Permissible Limit		55	45

Name of the Location : Juni Kamptee Village - NGON-4

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2018	04/06/2018	44.6	43.4
JUNE.2018	22/06/2018	44.8	42.9
Permissible Limit		55	45



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Branch Office : Shop No. 27, Shah Alpine, Plot No. 6, Sector-6, Kharghar, Navi Mumbai – 410 210
Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/0858	Report Date : 18-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) -440 01	
Name & Address of Mine : M/s. Gondgaon Extension Open Cast Coal Mine Expansion Project , Gondgaon Sub-Area, WCL, PO. Gondgaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENVT/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010 Sample Inward No. : ELPL/Dec.-17/269/16/AA-58	Sampling Location : 3.3 KV Substation Gondgaon Project
Sampling Date : From 11-12-17 to 12-12-17 Sample Receipt Date : 12-12-17	Sampled by : Mr. Anil Shrikhande, ELPL Representative
Avg. Ambient Temp : 21 °C Avg. Relative Humidity : 56 %	Prominent Wind Direction : NE Average Wind Speed : 1 Km/Hr
Period of Analysis : From 13-12-17 to 18-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	8.54	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	15.9	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	64.6	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	32.1	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20.0	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.14	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.78	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20.0	Indophenol Method, NAAQS Guideline, CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.2	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

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TMDy.TM



For Earthcare Labs Pvt. Ltd.

(K.L. Jadhav)
Quality Manager



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Mobile : 9766616867, E-mail : earthcare2000@gmail.com, Website : www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/0859	Report Date : 18-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.)- 440001	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENVT/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010	Sampling Location : Ghatrohna Village near Sonwane house
Sample Inward No. :ELPL/Dec.-17/269/16/AA-59	
Sampling Date : From 11-12-17 to 12-12-17 Sample Receipt Date : 12-12-17	Sampled by : Mr. Anil Shrikhande, ELPL Representative
Avg. Ambient Temp : 21 °C Avg. Relative Humidity : 56 %	Prominent Wind Direction : NE Average Wind Speed : 2 Km/Hr
Period of Analysis : From 13-12-17 to 18-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	8.85	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	18.6	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	71.0	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	34.8	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20.0	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.18	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.85	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20.0	Indophenol Method, NAAQS Guideline, CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.20	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)- particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

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For Earthcare Labs Pvt. Ltd.

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(K.L. Jadhav)
Quality Manager



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Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/0860	Report Date : 18-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) -4400 01	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENVT/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010 Sample Inward No. : ELPL/Dec.-17/269/16/AA-60	Sampling Location : Transit Hostel Gondagaon Sub area
Sampling Date : From 11-12-17 to 12-12-17 Sample Receipt Date : 12-12-17	Sampled by : Mr. Anil Shrikhande ELPL Representative
Avg. Ambient Temp : 21 °C Avg. Relative Humidity : 56 %	Prominent Wind Direction : NE Average Wind Speed : 2 Km/Hr
Period of Analysis : From 13-12-17 to 18-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	8.14	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	15.8	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	74.9	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	36.5	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-I:2012
5.	Ozone (O ₃)	µg/m ³	180	<20.0	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.22	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	1.10	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20.0	Indophenol Method, NAAQS Guideline, CPCB Vol.-I:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.20	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

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Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/0861	Report Date : 18-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) 440001	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project, Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENV/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample	Sampling Location : Grampanchayat Gondagaon
Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010	
Sample Inward No. : ELPL/Aug.-17/25806/AA-08	
Sampling Date : From 11-12-17 to 12-12-17	Sampled by : Mr. Anil Shrikhande ELPL Representative
Avg. Ambient Temp : 21 °C	Prominent Wind Direction : NE
Avg. Relative Humidity : 56 %	Average Wind Speed : 2 Km/Hr
Period of Analysis : From 13-12-17 to 18-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	10.0	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	20.2	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	76.0	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	36.7	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-I:2012
5.	Ozone (O ₃)	µg/m ³	180	<20.0	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.11	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.75	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20.0	Indophenol Method, NAAQS Guideline, CPCB Vol.-I:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.20	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

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Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/08167	Report Date : 29-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) -440 01	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENV/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010 Sample Inward No. : ELPL/Dec.-17/269/41/AA-167	Sampling Location : 3.3 KV Substation Gondagaon Project
Sampling Date : From 25-12-17 to 26-12-17 Sample Receipt Date : 26-12-17	Sampled by : Mr. Anil Shrikhande, ELPL Representative
Avg. Ambient Temp : 29 °C Avg. Relative Humidity : 43 %	Prominent Wind Direction : North Average Wind Speed : 5Km/Hr
Period of Analysis : From 27-12-17 to 29-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	7.3	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	14.5	Modified Jacob & Hochheiser Method , IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	69.2	Gravimetric Method , IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	34.1	Gravimetric Method, NAAQS Guidelines , CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.15	AES Method , IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.82	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20	Indophenol Method, NAAQS Guideline , CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	3.64	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full , without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

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Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/08168	Report Date : 29-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.)- 440001	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project, Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENVT/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010	Sampling Location : Ghatrohna Village near Sonwane house
Sample Inward No. : ELPL/Dec.-17/269/41/AA-168	
Sampling Date : From 25-12-17 to 26-12-17 Sample Receipt Date : 26-12-17	Sampled by : Mr. Anil Shrikhande, ELPL Representative
Avg. Ambient Temp : 29 °C Avg. Relative Humidity : 43 %	Prominent Wind Direction : North Average Wind Speed : 5 Km/Hr
Period of Analysis : From 27-12-17 to 29-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	7.8	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	16.2	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	74.4	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	36.3	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.19	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.89	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20	Indophenol Method, NAAQS Guideline, CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	3.5	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

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For Earthcare Labs Pvt. Ltd.
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Quality Manager



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Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/08169	Report Date : 29-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) -4400 01	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENV/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010 Sample Inward No. : ELPL/Dec.-17/269/41/AA-169	Sampling Location : Transit Hostel Gondagaon Sub area
Sampling Date : From 25-12-17 to 26-12-17 Sample Receipt Date : 29-12-17	Sampled by : Mr. Anil Shrikhande ELPL Representative
Avg. Ambient Temp : 29 °C Avg. Relative Humidity : 43 %	Prominent Wind Direction : North Average Wind Speed : 5 Km/Hr
Period of Analysis : From 27-12-17 to 29-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	9.6	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	18.8	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	76.5	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	38.2	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.27	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	1.20	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20	Indophenol Method, NAAQS Guideline, CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	3.74	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

Verified By

[Signature]

TM/Dy.TM



For Earthcare Labs Pvt. Ltd.

[Signature]
(K.L. Jadhav)
Quality Manager



EARTHCARE LABS PRIVATE LIMITED

Environmental Laboratory & EIA Consultant Organization

(MOEF Recognized, NABET QCI Accredited, ISO 9001, ISO 14001 & OHSAS 18001 Certified)

Head Office : C-11, Amar Enclave Commercial Wing, Jog Layout, Prashant Nagar,
Near Ajni Square, Nagpur – 440 015 **Tel & Fax :** (0712) 2251470, **Mobile :** 9766616862

Branch Office : Shop No. 27, Shah Alpine, Plot No. 6, Sector-6, Kharghar, Navi Mumbai – 410 210
Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/08170	Report Date : 29-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) 440001	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENV/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010 Sample Inward No. : ELPL/Dec.-17/269/41/AA-170	Sampling Location : Grampanchayat Gondagaon
Sampling Date : From 25-12-17 to 26-12-17 Sample Receipt Date : 29-12-17	Sampled by : Mr. Anil Shrikhande ELPL Representative
Avg. Ambient Temp : 29 °C Avg. Relative Humidity : 43 %	Prominent Wind Direction : North Average Wind Speed : 5 Km/Hr
Period of Analysis : From 27-12-17 to 29-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	7.4	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	16.3	Modified Jacob & Hochheiser Method , IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	69.3	Gravimetric Method , IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	34.5	Gravimetric Method, NAAQS Guidelines , CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.12	AES Method , IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.60	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20	Indophenol Method, NAAQS Guideline , CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.2	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)- particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full , without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

Verified By

[Signature]

TM/Dy.TM



For Earthcare Labs Pvt. Ltd.

[Signature]
(K.L. Jadhav)
Quality Manager

2.30 MINE CLOSURE PLANNING

2.30.1 Mine closure planning has to be carried out at the starting of the mine and needs periodic reviewing and revision during its life cycle to cope with the geo-technical constraints, safety and economic risks, social & environmental challenges. For the Mine Closure activities, a corpus fund is created by opening an escrow account with the coal controller organization in nationalised bank. For opencast mine, an amount @ Rs 6.00 lakhs per Ha of the project area and for underground mine, an amount @ Rs 1.00 lakhs per Ha of the project area is required to be deposited in this account for final mine closure. Progressive mine closure is done with the fund provided in approved report. The above rate has been adopted as per Circular No. 55011-01-2009-CPAM, GOI, Ministry of Coal, dated 27 August 2009.

2.30.2 EXISTING MINE CLOSURE CORPUS

The existing Mine Closure Cost was assessed for 12 years life and ML area of 845.74 ha with a mine target of 2.50 Mty. The total mine closure fund for Amalgamated Gondagaon Ghatrohan OC deposited in the Escrow A/c till date is as follows :

Year	Mine Closure Amount Deposited in Escrow A/c
2013-14	Rs 14.8284 crs
2014-15	Rs 5.9528 crs
2015-16	Rs 2.5502 crs
2016-17	Rs 4.3733 crs
2017-18	Rs 5.0458 crs
Total	Rs 32.7506 crs

2.30.3 REVISED MINE CLOSURE CORPUS AS PER APPROVED MINING PLAN FOR 3.50 MTY

The Mining Plan for Expansion Gondagaon Extension Opencast Coal Mine project (Amalgamated Gondagaon Ghatrohan OC mine) was approved by

WCL for 3.50 Mty capacity. Accordingly, the Revised Mine Corpus for Gondagaon Extension Opencast Coal Mine Expansion project (Amalgamated Gondagaon Ghatrohan OC mine) was prepared by WCL in October, 2017 for enhance target capacity of 3.50 Mty and life of 10 years (balance life of 8 years as on 01.04.2017). The calculation of above Mine Closure Cost is tabulated below :

Sl. No.	Details	Qty
1	WPI for All Commodities for Aug 2009 (Old Series)	129.6
2	WPI for All Commodities for Sept, 2017 (Provisional) (New Series)	114.3
3	WPI for All Commodities for Sept, 2017 (Provisional) (Converted to Old series, conversion factor = 1.561)	178.4223
4	Ratio of WPI = (3) / (1)	1.3767153
5	Total land area requirement for the project excluding 21.66 ha land required for rehabilitation Colony (ha) =	824.08
6	Mine closure cost @ Rs 6 lacs/ha (Rs in Lakhs) =	4944.48
7	Mine closure cost after indexing from August, 2009 to September, 2017 (Rs. In Lakhs) = (6) x (4) =	6807.14
8	Total Mine Closure Amount deposited in Escrow A/c upto 2016-17 (Rs. In Lakhs)	2770.47
9	Total Mine Closure Corpus after adjusting the amount deposited in Escrow A/c (Rs. In Lakhs) = (7) – (8) =	4036.67
10	Balance Life of the mine as on 01.04.2017 (Total Life of 10 years – 2 years completed (2015-16 & 2016-17)	8
11.	Annual Contribution to Escrow fund for 2017-18 (Rs in Lakhs) = (9) / (10) =	504.58

2.30.4 MINE CLOSURE CORPUS AS PER PRESENT MINING PLAN

The total Mine Lease area in the approved Mining Plan and above Mine Closure Plan was 845.74 ha and mine life was 8 years as on 01.04.2017. This Revised Project Report has been prepared for the same Mine Lease Area of 845.74 ha and same mine life (balance life of 7 years as on 01.04.2018).

Hence, the Mine Closure Plan detailed above in Para. 18.2 approved by WCL based on the approved Mining Plan for 3.50 Mty will remain valid for this updated RPR of Amalgamated Gondegaon Ghatrohan OC mine.

The year-wise Mine Closure Cost with 5% escalation in subsequent years is tabulated below :

YEAR-WISE MINE CLOSURE COST

Year			Annual Production (Mty)	Corpus Fund (Rs. in Lakhs)	Mine Clos ure Cost (Rs /t)
From opening Year of Escrow A/c	Opening Year of proposed RPR (Feb, 2018	Calendar Year			
A) Closure Cost already deposited / to be deposited upto 2017-18					
1		2013-14	1.820	1482.84	81.48
2		2014-15	1.860	595.28	32.00
3		2015-16	2.130	255.02	11.97
4		2016-17	2.150	437.33	20.34
5		2017-18	2.76	504.58	18.28
	Sub-Total (A)		10.72	3275.05	
B) Closure Cost To Be Deposited as Per RPR (Feb, 2018) for 3.50 Mty					
6	1	2018-19	3.00	529.81	17.66
7	2	2019-20	3.20	556.30	17.38
8	3	2020-21	3.40	584.12	17.18
9	4	2021-22	3.50	613.32	17.52
10	5	2022-23	3.50	643.99	18.40
11	6	2023-24	3.50	676.19	19.32
12	7	2024-25	2.09	710.00	33.97
Sub- Total (Year-6 to 12) (Year 1 to 7 of RPR, Feb, 2018)			22.19	4313.75	19.44
Total			32.91	7588.80	23.06

In this RPR, the mine closure cost of Rs. 19.44/t has been considered in the estimate of unit cost of production.

2.30.5 BREAK-UP OF CLOSURE FUND FOR VARIOUS CLOSURE ACTIVITIES

The activity wise break-up of mine closure corpus fund is tabulated below :

Activity wise Break-up of Closure Cost

Sl. No.	Activity	% of Total Mine Closure Cost	Amount (Rs in Lakhs)	Remarks
A	Dismantling of structures			
	Service Building	0.2	15.18	To be included in final mine closure plan.
	Residential Building	2.67	202.62	
	Industrial Structures like, Workshop, Field substation, etc.	0.3	22.77	
B	Permanent Fencing of mine void and other dangerous area			
	Random rubble masonry of height 1.2 meter including leveling up in cement concrete 1:6:12 in mud mortar	1.5	113.83	To be included in final mine closure plan.
C	Grading of highwall slopes			
	Levelling and grading of highwall slopes	1.77	134.23	To be included in final mine closure plan.
D	OB Dump Reclamation			
	Handling/Dozing of OB Dump into mine void and preparation of Internal dump for reclamation.	88.66	6728.29	71% for progressive and 17.66% for final mine closure.
	Technical and Bio-reclamation including plantation and post care.	0.4	30.36	Equal Weightage through-out the life of the mine.
E	Landscaping			
	Landscaping of the open space in leasehold area for improving its aesthetic and eco value.	0.3	22.77	Equal Weightage through-out the life of the mine.
F	Plantation			
	Plantation over cleared area obtained after dismantling.	0.5	37.95	To be included in final mine closure plan.
	Plantation around the quarry area and in safety zone.	0.2	15.18	Equal Weightage through-out the life of the mine.
	Plantation over the external OB Dump	0.02	1.52	Equal Weightage through-out the life

Sl. No.	Activity	% of Total Mine Closure Cost	Amount (Rs in Lakhs)	Remarks
				of the mine.
G	Post Closure Env Monitoring/Testing of Parameters for three years.			For three years after mine closure
	Air Quality	0.22	16.70	
	Water Quality	0.2	15.18	
H	Entrepreneurship development (vocational/ skill development) Training for sustainable income of affected people.	0.26	19.73	Equal Weightage through-out the life of the mine.
I	Miscellaneous and other mitigative measures.	2	151.78	Equal Weightage through-out the life of the mine.
J	Post Closure Man power cost for supervision	0.8	60.71	To be included in final mine closure plan.
TOTAL		100%	7588.80	

1. Mining is to be carried out in a phased manner initiating afforestation / reclamation work in the mined out area of first phase while commencing mining in the 2nd phase.
2. Upto 80% of the total deposited amount including interest accrued in the ECSROW account may be released after every 5 years. The amount released should be equal to expenditure incurred on Progressive Mine closure in past 5 years or 80% whichever is less.
3. The above cost / expenditure will be met from the corpus fund deposited in the escrow account by the mine operator. However, the additional amount beyond the escrow account will be provided by the mine operator after estimating the final mine closure cost (as per the mine closure guideline).
4. The amount indicated separately under each head in the above table is indicative only and based on actual expenditure the amount may

DISASTER MANAGEMENT PLAN

The mining plan has been drawn in conformity with the prevailing statutory provisions applicable for safety in Opencast Mines. However following matters related to safety during opencast operations have to be given special considerations.

1 PRECAUTIONS AGAINST SURFACE WATER

Ghatrohan Sub-quarry is at 100 m distance from Kanhan River and a part of quarry falls below HFL. The HFL of Gondegaon & Ghatrohan Opencast block is 279.035 m recorded on 7th Sept.1994 by Inder Colliery Survey Office. Since there is a danger of flood water from Kanhan river to proposed quarry, a flood protection embankment has been proposed. The proposed embankment is 30m wide at the top and of height 6m above HFL. As per prevailing practice, proposed embankment has to be constructed by spreading the suitable soil i.e fine grained soil for Hearting zone and coarse grained soil for casing zone in continuous layers and compacted by mechanical means i.e. by rollers to standard optimum dry density at optimum moisture content. Also it has been proposed to provide 300 mm thick boulders pitching on water side of embankment upto HFL. However for portion of embankment where the surface level is higher than the HFL, no pitching has been envisaged.

However before adoption of this section it is suggested that the proposed embankment section may be got approved by competent authority like Maharashtra Irrigation department of Govt. of Maharashtra and DGMS for its structural safety and stability. The alignment of the proposed embankment is shown in Quarry Layout Plan. It is also suggested to determine withdrawal level/Danger mark, so that as water level crosses the limit, workings shall be stopped.

Suitable alarms connected to float in Kanhan river, would be provided at strategic places like Time Keeper Office, Security Office, Safety Office, Manager Residence, Pit Office etc. The floats in the river would activate the alarms as soon as the water level in the river crosses the danger mark. Suitable action can then be taken to investigate the alarm and take other suitable precautions. In addition, river side patrolling would also be carried out during monsoon to caution the project authority in case of any sudden rise in the river. Adequate wireless communication sets have been provided for the above purpose. The rain water falling within the project area

would be diverted from the quarry area by providing garland drains and shall be collected towards low lying area.

2 FIRE & SPONTANEOUS HEATING

Wild or herbaceous plants shall be removed from the mine. No person shall deposit heated material or ashes on any opencast working. Also no person shall light a fire or permit a fire to be lighted in any OC working except by the permission in writing of the Manager and only for a special purpose specified therein. No coal shall be left exposed in coal benches more than its incubation period to avoid fire in seam due to spontaneous heating. Proper type of the extinguisher to be kept in each HEMM ready for use in case of emergency. One Fire Fighting Truck has been provided. In coal stock, coal shall be dispatched on the basis of first in first out.

3 SLOPE STABILITY

It is suggested that following action may be taken to deal with slope stability problem.

- a. Vulnerable area may be identified and marked on quarry plan.
- b. Observation of actual alignment of fault, its throw, joints, etc. may be recorded during the process of exploitation.
- c. Water drainage system may be properly implemented to prevent accumulation of water in cracks. Also dumps shall be leveled to prevent accumulation of water over it. Proper drainage in dumps shall be also provided to prevent erosion of toe of dump. A provision of Rs 50.00 lacs have been kept in Appendix-A.8.1 for dump monitoring equipment so as to effectively monitor dumps on a regular basis.
- d. Regular monitoring of tension cracks, horizontal and vertical movement of strata in critical area may be done.
- e. Rise side slope to be reinforced if required because it has to stand throughout quarry life. No dumps/surface structures to be located within 15m of quarry edge as it will act as surcharge there by destabilizing the slope.
- f. No undercutting of slopes to be done.
- g. Proper hydrogeological studies to be done if water table is at level of slope it should be brought down by using submersible pumps to prevent hydrostatic pressure.
- h. Proper selection of site for dumping to be done and place shall be made free from loose material. Dumping shall not be done at an angle more than angle

of repose of material being dumped.

- i. After completion of dumping operations, dumps to be stabilized by growing vegetation.
- j. Every person deployed by leaser of HEMM must be trained & briefed about aspects related to slope stability.

4 HAUL ROAD MAINTENANCE

Adequate care must be taken for proper construction and maintenance of haul road as per the existing guidelines. The gradient of haul road should not be steeper than 1 in 16.

5 BLASTING OPERATIONS

As explosives are required in bulk for blasting in OC mines, provision of regulation - 164 A of CMR 1957 should be ensured. All blasting operations shall be carried out in day light. Suitable precautions shall be taken as per statute before and after blasting operations. Controlled blasting technique has to be practised to minimise fly off rocks and ground vibrations and keep them within safe limits. In order to keep the ground vibrations within the permissible limit as per DGMS Circular No. 7 of 1997, to avoid flying of rock fragments and also to achieve satisfactory blasting results, optimized drilling / blasting parameters depending upon rock formation using combination of relays / delays will have to be evolved. It is further recommended that at the time of actual execution, proper study for controlled blasting and ground vibration is done with scientific body in order to evolve site specific charge distance relationship.

6 SCIENTIFIC STUDIES

Following areas have been identified in the proposed mine for detailed scientific studies:

a) Slope Stability

It is proposed to carry out scientific study on slope stability of external and internal OB dumps as well as for final slope of quarry batter. Based on the findings of scientific research the proposed slope of dumps and batter may change.

b) Drilling & Blasting

For optimum fragmentation of rock and coal to minimize the overall cost of excavation, it is proposed to engage some scientific body to carry out research for optimum drilling

and blasting. Accordingly, the powder factor suggested after this study will be followed in the proposed mine.

c) Hydrogeology

Proper provision has been made for scientific study to assess the hydrogeological parameters of the proposed area.

In addition to this, various other parameters like, soil testing, etc. need scientific study. A capital provision of Rs. 30.00 Lacs has been kept for the above scientific studies.

वेस्टर्न कोलफील्ड्स लिमिटेड
Western Coalfields Limited

ANNEXURE - VI
बोर्ड सचिवालय
BOARD SECRETARIAT

पंजी. कार्यालय : कोल इस्टेट, सिविल लाईन्स, नागपुर - 440 001
Regd. Office : Coal Estate, Civil Lines, Nagpur - 440 001

का/ओ 0712 - 2511216
e-Mail ramehar@westerncoal.gov.in

**BOARD MATTER
CONFIDENTIAL**

WCL/BD/SECTT/BM-293/2017/935

DATE : 10/11/2017

Reproduced below is the relevant excerpt from the minutes of 293rd meeting of the Board of Directors of WCL held on 31st October, 2017 :

"ITEM NO.293/ C-23

SUB Approval of mining plan for obtaining environmental clearance from MOEF & CC for enhanced capacity from 2.50 MTPA to 3.50 MTPA coal production of Gondagaon Extension Opencast Coal Mine Expansion Project (Amalgamated Gondagaon Ghatrohana OC Mine of Nagpur Area)

-
- i) In consideration of the proposal brought out in the agenda note, the Board, after deliberation accorded approval for mining plan of Gondagaon Extension Opencast Coal Mine Expansion Project (Amalgamated Gondagaon Ghatrohana OC Mine at Nagpur Area) for obtaining environmental clearance from MOEF & CC for enhanced capacity from 2.50 MTPA to 3.50 MTPA coal production.
- ii) GM (P&P) to take necessary action in the matter."


COMPANY SECRETARY

GENERAL MANAGER (P&P)

cc : DIRECTOR (TECHNICAL) OP
DIRECTOR (PERSONNEL)
DIRECTOR (FINANCE)
DIRECTOR (TECHNICAL) P&P



भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FORESTS
& CLIMATE CHANGE

Regional Office (WCZ)
Ground Floor, East Wing
New Secretariat Building
Civil Lines, Nagpur - 440001
E-mail: apccfcentral-ngp-mef@gov.in

F.No:EC-766/2018-NGP/4810

Date: 21.01.2019

To,

Scientist 'E'
IA Division (Coal Mining)
Ministry of Environment, Forest & Climate Change
Indira Paryavaran Bhawan,
Aliganj, Jorbagh Road,
New Delhi-110003

Sub: Environmental clearance granted for Gondegaon Extension Opencast Coal Mine Project from 2.5 MTPA to 3.5 MTPA by M/s. Western Coalfields Limited in an area of 917 ha. in village Gondegaon, Tehsil Parseoni, District Nagpur

Ref:

1. Ministry of Environment, Forests & Climate Change letter no. J-11015/106/2009-IA.II(M) dated 14.03.2018

Sir,

I am directed to invite your kind attention on the above subject and letter under reference. Monitoring report of compliance to conditions stipulated in Environment Clearance accorded to Gondegaon Extension Opencast Coal Mine Project from 2.5 MTPA to 3.5 MTPA by M/s. Western Coalfields Limited in an area of 917 ha. in village Gondegaon, Tehsil Parseoni, District Nagpur is enclosed herewith. Site inspection has been carried out on 03.01.2019.

Ministry granted environmental clearance vide letter dated 14.03.2018 for the project for expansion of coal mine from 2.5 MTPA to 3.5 MTPA for a period of one year. Maximum production achieved till date is 3.16 million tonnes during 2017-18. As per the details provided, construction works at rehabilitation site of the Gondegaon village completed and 400 families already shifted to the rehabilitation site. Backfilling of mine out area is in progress. An area of 9.950 ha has been backfilled up to ground level and about 31 ha. area is under backfilling. Plantation has been carried out over an area of 128.2 ha. Embankment of 5.7 km provided for the Kanhan River. Water sprinkling system has been provided for the coal handling plant, haul roads, coal stock yards. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondegaon has been started by

3/35

MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.

This issues with the approval of APCCF (Central), Regional Office, Nagpur.

A. Suresh Kumar
21/01/19
Suresh Kumar Adapa
Scientist 'D'

Encl: as above

Copy to:

1. Director RO HQ, Ministry of Environment, Forest & Climate Change, Government of India, 1st Floor Agni Wing, Indira Paryavaran Bhawan, Jorbagh Road, New Delhi-110 003
2. Director (Monitoring Cell), Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, Aliganj, Jorbagh Road, New Delhi-110003
3. General Manager(Environment), Western Coalfields Limited, Coal Estate, Civil Lines Nagpur-440001
4. Guard file

A. Suresh Kumar
21/01/19
Suresh Kumar Adapa
Scientist 'D'

**MONITORING THE IMPLEMENTATION OF ENVIRONMENTAL
SAFEGUARDS
MINISTRY OF ENVIRONMENT & FORESTS
REGIONAL OFFICE (W), BHOPAL MONITORING REPORT
DATA SHEET**

SUBMITTED BY PA

1	Project types River-valley/ Mining/ Industry/ Thermal/ Nuclear/ other (specify)	Opencast Coal Mining Project
2	Name of the Project	Expansion of Gondegaon Extension Opencast coal mine project
3	Clearance letter(s)/ OM no. & date	J-11015/106/2009-IA-II(M) dtd.14.03.2018
4	Location :	
	a) District(s)	NAGPUR
	b) State (s)	MAHARASHTRA
	c) Latitude	22° 16' N - 22° 16' N.
	d) Longitude	79° 11' E - 79° 12' E.
5	Address for correspondence :	
	a) Address of concerned Project Chief Engineer (with pin code & telephone/fax).	Project Officer, Gondegaon OC, Gondegaon Sub-Area, WCL, PO. Gondegaon, Nagpur, Maharashtra.
	b) Address of Executive Project Engineer/ Manager (with pin code/fax nos.)	Area General Manager, WCL, Nagpur Area, P.O. Jaripatka, Nagpur - 440 014, Maharashtra, Ph. (0712) 2643655, FAX (0712) 2643352.
6	Salient features :	
(A)	Of the project :	
1.	Production Capacity	EC Capacity: Normative 2.50 MTPA to Peak 3.50 MTPA.
2.	Lease hold Area	
3.	Balance Mineable coal reserve	22.19 Mt
4.	Total OB including access trench	
5.	Average S/R (m ³ /t)	4.43
6.	Life of the Project	7 Years as on 01.04.2018
7.	Quarry area on floor	182.78 Ha
8.	Quarry Area on Surface	277.13 Ha
9.	Average strike length on floor	3000 m
10.	Average thickness of seam	27.72 m
11.	GCV of coal (0.10m dilution at each contact period)	G-10 (Seam -V & IV) G-8 (Seam-III & II)
12.	Target production (Mty)	3.50
13.	Total OB (Mn3)	98.20
14.	Manpower requirement (nos.)	921
15.	Overall MOS (t)	14.395
(B)	Of the Environment management plan	
1.	Public Hearing	Done on 26.04.2005 for 2.5 MTPA (For 3.5 MTPA public consultation is exempted)
2.	Environment clearance	Normative 2.50 MTPA to Peak 3.50 MTPA

3/25

		vide ref no.J-11015/106/2009-IA.II(M) Dated 14.03.2018
3.	Consent to Establish	Issued vide ref no.BO/CAC CELL/UAN NO.0000041397/R/CAC-1804000354 Dated 07.04.2018 for 1 MTPA i.e 2.5 MTPA TO 3.5 MTPA
7	Breakup of the project area	
	Submergence Area : Forest & non-forest area	No Forest area involved
1.	Non Forest Area	845.74 Ha
2.	Quarry Area	277.13 Ha
3.	Embankment Area	13.05 Ha
4.	External OB Dump Area	323.98 Ha
5.	Infrastructure	50.00 Ha
6.	Project township	13.00 Ha
7.	Area needed for rationalization and blasting zone	146.92 Ha
	Total Land	845.74 Ha

8	Break-up of the project affected population with enumeration of those losing houses/ dwelling units only/agricultural land only, both dwelling units and agricultural land, landless labourers/artisans: a) SC / ST Adivasis : (Please indicate whether these figures are based on any scientific/systematic survey carried out or only provisional; if a survey is carried out give details with year of survey)	Presently land has been purchased and compensation and/ or employment given to land losers. Some villagers have already shifted to new Gondegaon Rehab site (19.24 HA), near Kandri village and construction of their new houses is under progress. Also hospital and other amenities are under construction. In addition to compensation for land ousters, total 422 entitled persons have been given employment as per norms. (provisional figures)				
9.	Financial details :					
	a) Project Cost as originally planned and subsequent revised estimates and the year of price reference.	Capital Cost of Extension Project Rs. 325.1802 Crores (as per RPR March 2018)				
	b) Allocation made for environmental management plans with item wise and year wise break-up.	A. Pollution Control : (Amount in Rs.'000)				
		<table><tr><td>i) Sedimentation pond for treatment of mine waste water</td><td>3500</td></tr><tr><td>ii) ETP for</td><td>2000</td></tr></table>	i) Sedimentation pond for treatment of mine waste water	3500	ii) ETP for	2000
i) Sedimentation pond for treatment of mine waste water	3500					
ii) ETP for	2000					

		treatment of workshop waste water.	
		iii) Base line environmental data generation & scientific studies related to environment	1500
		iv) Dust suppression arrangement at haul road, stockyard, permanent road etc.	2500
		Plantation during first three years.	2000
		DETP for Qtrs.	5000
		v) Land reclamation measures including land use mapping through Remote Sensing.	1200
		Air Monitoring (CAAQMS)	6000
		Total	23700
c)	Benefit cost ratio/Internal rate of Return and the year of assessment.	Financial rate of return IRR = 82.45 % (100%) & 42.09 (85%) Production.	
d)	Whether (c) includes the cost of Environmental management as shown above	Yes.	
e)	Actual expenditure incurred on the project so far (Capital)	339.87 Crores expenditure incurred on project so far (Upto March'18)	
f)	Actual expenditure incurred on the environmental management so far (Capital & revenue)	Capital -- 191.73 Lakhs. Revenue--304.00 Lakhs	
10	Forest land requirement: a. the status of approval for diversion of forestland for non-forestry use. b. The status of clearing felling. c. The status of compensatory afforestation programme in the light of actual field experience.	Not applicable as non-forest land is not involved	
11	The Status of clear felling in non-forest areas (such as submergence area of reservoir, approach roads) if any quantitative information	Not Applicable.	

SUBMITTED

BY PA

12	Status of construction: a. Date of commencement (Actual and /or planned). b. Date of completion (actual and /or planned)	As per approved project report
13	Reasons for delay if project is yet to start	Not Applicable
14	Dates of site visits :	
	a) The dates on which the project was monitored by the Regional Office on previous occasions, if any.	A copy of the certificate issued vide letter F.No:3-11/2014(Env.)/3035 Dated 13.12.2017 (Copy attached-Annexure 4)
	b) Date of site visit for this monitoring report	Date of site visit 29.11.2017
15	Details of correspondence with project authorities for obtaining action plans/ inf. on status of compliance to safeguards (other than the routine support for site visits) (The first mon. report letters for logistic may contain the details of all the letters issued so far, but the later reports may cover only the letters issued subsequently)	-----

As made  Sub Area Manager,
Gondegaon OCM, Nagpur Area, WCL

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Compliance status of conditions stipulated in environmental clearance granted for Gondegaon Extension Opencast Coal Mine Project from 2.5 MTPA to 3.5 MTPA by M/s. Western Coalfields Limited in an area of 917 ha. in village Gondegaon, Tehsil Parseoni, District Nagpur granted by MoEF&CC vide letter no. J-11015/106/2009-IA.II(M) dated 14.03.2018

S.No.	Condition	Compliance Status
i.	Mitigative measures to be undertaken to control dust and other fugitive emissions all along the roads by providing sufficient number of water sprinklers. Mist type mobile sprayers/ sprinklers shall be deployed for the project.	Complying with. Sprinkling arrangement has been made for weigh bridge, CHP, haul roads, coal stock yards, coal transportation road. Following are the details of sprinklers provided at the project: • 10 nos. of fixed sprinklers are in operation near Weigh Bridge, along coal transportation road and portable sprinklers around coal stock yards. • 3 Nos. of mobile tankers of capacity 28 KL with mist arrangement, and 2 Nos. of tankers of capacity 12 KL & 8KL for dust suppression on haul roads, coal transportation roads. In addition to the above following arrangements have been made for controlling the fugitive emissions: • Coal transportation road of 8.6 km is black topped with avenue plantation • 1 no. of mechanical sweeper is in operation. • Plantation of 3, 93,905 no.s of saplings has been carried out over an area of 128.20 ha. • All the trucks carrying coal outside the project are covered by tarpaulin. • Coal handling plant (CHP) in the mine is provided with enclosures, side claddings and sprinklers. PA submitted that Installation of Comprehensive mist sprinkler system is proposed for dust suppression and control of air pollution in crushers, along conveyors belt, transfer points, bunkers of CHP and the same is expected to commissioned by March' 2019.
ii.	Regular monitoring of the occupational and other health hazards of all employees including outsourced workers and the corrective action shall be ensured. Report in this regard is submitted to Regional Office of the Ministry.	Complying with. Medical checkup of the employees is being carried out as per the following schedule: 1. Once in 5 years for the people under 45 years of age 2. Once in 3 years for the people over 45 years of age

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		PA submitted that initial (IME) and periodical medical examination (PME) is being carried out for permanent and outsourced employees. As per the information provided 56 IME and 133 PME has been carried out till date. Details of the medical examination are being submitted to Regional Office along with six monthly compliance report.
iii.	Control blasting techniques should be adopted to control ground vibration and fly rocks.	Complying with. Controlled blasting is being carried out as per the DGMS guidelines. Delay detonators are being used to arrest the fly rocks and boulders.
iv.	Persons of nearby villages shall be given training for their livelihood and skill development.	PA agreed to comply with. PA submitted that skill development training is being provided for nearby villagers, project affected persons for data entry, machine operations, nursing assistant, para medical assistant, plastic processing machine operator etc., under project UDAN and AROGYAA on regular basis.
v.	To ensure the health and welfare of nearby villages, regular medical camps shall be organized and report shall be submitted to the Regional Office of the Ministry.	PA agreed to comply with. PA submitted that medical camps for detection of diabetes, Eye checkup, blood donation, Spirometry are being conducted regularly. As per the information provided previous medical camp was held during April 2018 to August 2018 for blood donation, HBA1C, Spirometry, cancer screening, anaemia detection, etc.
vi.	Wind barrier wall / screen and vertical greenery system, green belt, dust suppression arrangement at railway siding to be installed.	Complying with. One truck mounted mist spray system has been provided at the railway siding. As per the information provided, 5000 no.s of saplings of native species have been planted at the railway siding. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondegaon has been started by MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.
vii.	Three tier multi-species green belt of not less than 7.5 m width should be developed all along the project to mitigate / check the dust pollution. Only native species to be used for plantation / greenbelt development.	Complying with. Green belt has been developed over an area of 128.2 ha. with the plantation of 3,93,905 trees of different species. Avenue plantation has been carried out along the coal transportation road. PA submitted that an area of 255 ha. will be reclaimed biologically till the end of mine life.
viii.	In the view of the mining potential of the area and the prevailing environmental concerns, carrying capacity of riverine eco-system shall be studied through some expert agencies to assess impacts	PA agreed to comply with. PA submitted that a report has been prepared and presented before EAC during its 34 th meeting held on 24 th July, 2018 with a submission that the detailed

	on the environmental components.	study of Kanhan river will require 18-24 months for completion of which include 12 months for 4 seasons data generation and remaining months for validation & interpretation and preparation of final report.
ix.	A mitigation plan based on the study to be submitted to the MoEF & CC Regional Office / SPCB and displayed on company's website.	
4.1 (a) MINING		
i.	Mining shall be carried out under strict adherence to the provisions of mines act 1952 and subordinate legislations made there-under as applicable.	PA agreed to comply with.
ii.	No change in the mining method i.e. OC to UG, calendar programme and scope of work shall be made without obtaining prior approval of Ministry of Environment, Forest and Climate Change (MOEF&CC).	PA agreed to comply with.
iii.	Mining shall be carried out as per the provisions outlined in approved Mining Plan(including Mine Closure Plan) abiding by Mining laws related to the coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).	PA agreed to comply with.
iv.	No mining shall be carried out in the forest land without obtaining forestry clearance as per Forest (Conservation) Act, 1980 and also adhering to The Schedule Tribes and other Traditional Forest Dwellers (Recognitions of Forest Rights) Act, 2006 read with provisions of Indian Forest Act, 1927.	PA agreed to comply with. No forest land involved in the project
(b) Land Reclamation and Water Conservation		
i.	Digital survey of the entire lease hold area/core zone using Satellite Remote Sensing Survey shall be carried out regularly in three years for monitoring land use pattern and report in 1:50000 scale shall be submitted to Ministry of Environment, Forest and Climate Change/Regional Office (RO).	Complying with. As per the information provided, land use pattern of the mine lease area is being monitored through time series land use maps based on satellite imagery (IRS R2 L4FX). The latest report has been prepared in year 2017. As per the report, 136.03 ha. of area was under plantation, 32.88 ha. under backfilling, 101.71 ha. under active mining. Copy of the report has been submitted to Regional Office along with six monthly compliance report and also the same has been uploaded to company website.

ii.	The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of river /rivulet/pond/lake etc., shall be prepared and implemented by project proponent. The surface drainage plan and/or diversion of natural water courses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/GOI Authority. The construction of embankment to prevent any danger against in rush of surface water into the mine should be as per approved Mining Plan and permission of DGMS.	There are no surface water bodies like river/pond/lake in the mine lease area. The mining activities are being carried out by maintaining safe distance of more than 400 meters from the River Kanhan. As per the details provided embankment of length 5700 meters (width 30 meters and height of 6 meters) has already been constructed along the mine boundary towards the river side.
iii.	Final mine void depth should be preferably as per the approved Mine Closure Plan, and in case it exceeds 40 m adequate engineering intervention shall be provided for sustenance of aquatic life therein. The remaining area should be back filled and covered with thick and alive top soil. Post Mining land be rendered usable for agricultural /forestry purposes and shall be handed over to the respective State Government as specifies in the guidelines for Preparations of Mine Closure Plan issued by the Ministry of Coal dated 27-08-2009 and subsequent amendments.	PA agreed to comply with. As per the information provided, total quarry area will be 277.13 ha. 40 ha. will be backfilled and reclaimed. Another 30 ha. area will be back filled upto ground level. Remaining area will be converted into water body (with depth of 176 m.). PA submitted that 9.950 ha has been backfilled up to ground level and remaining area of about 31 ha is under backfilling.
iv.	The entire excavated area, backfilling, external OB dumping(including top soil) and afforestation plan shall be in conformity with the "during mining"/"post mining" land use pattern, which is an integral part of the approved Mining plan and the EIA/EMP submitted to this Ministry. Progressive compliance status vis-à-vis the post mining land use pattern shall be submitted to the Ministry of Environment, Forest & Climate Change/ Regional Office on six monthly basis.	PA agreed to comply with. PA submitted that mining activities are being carried out as per the approved mining plan. Till date, 9.95 ha of area is backfilled up to ground level. Plantation of 3, 93,905 no.s of saplings has been carried out over an area of 128.20 ha.
v.	The top soil shall temporarily be stored at earmarked site(s) only and it shall not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation purpose. Active OB dumps shall be stabilized with native grass species to prevent erosion and surface runoff. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforestrated in line with	PA agreed to comply with. Top soil has been dumped at designated place. As per the information provided it is being utilized for plantation. As per the information provided, total quarry area will be 277.13 ha. 40 ha. will be backfilled and reclaimed. Another 30 ha. area will be back filled upto ground level.

	the approved Mine Closure Plan. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change on six monthly basis.	
(c) Emissions, effluent and waste disposal		
i.	Transportation of coal, to the extent permitted by road shall be carried out by covered truck/conveyer. Effective control measures such as regular water/mist sprinkling/rain gun shall be carried out in critical areas prone to air pollution (with higher value of PM10/PM2.5) such as haul road, loading/unloading and transfer points. Fugitive dust emissions from all the sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/State Pollution Control Board.	Complying with. Coal transportation trucks are being covered with tarpaulin. Water sprinkling arrangement has been made on haul roads, CHP and coal transportation road. Black topped road has been provided for coal transportation. Avenue plantation has been provided. Mechanical sweeper has been provided for sweeping the coal transportation road periodically. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondagaon has been started by MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.
ii.	Green belt consisting of 3 tier plantation of width not less than 7.5 m shall be developed all along the mine lease area in a phased manner. The green belt comprising a mix of native species shall be developed all along the major approach/coal transportation roads.	Complying with. As per the information provided, plantation of 3,93,905 no.s of saplings has been carried out over an area of 128.20 ha. PA submitted that an area of 255 ha will be reclaimed biologically end of the mine life. Avenue plantation has been provided coal transportation road.
iii.	The transportation of the coal shall be carried out as per the provisions and route proposed in the approved Mining Plan. Transportation of coal through the existing road passing through the any village shall be avoided. In case, it is proposed to construct a "bypass" road, it should be constructed so the impact of sound, dust and accidents are appropriately mitigated	Complying with. Coal transportation road is not passing through any village. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondagaon has been started by MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.

iv.	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.	Complying with. Vehicles used for transporting the mineral are covered with tarpaulin. PA submitted that vehicles engaged in the mining activities are having valid PUC certificate. Also regular inspection is being done and the vehicles are being monitored continuously through CCTV camera.
v.	Coal stock pile/ crusher /feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors should be fully covered to avoid air borne dust. Side cladding all along the conveyer gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.	PA agreed to comply with. 10 nos. of fixed sprinklers are in operation near Weigh Bridge, along coal transportation road and portable sprinklers around coal stock yards. CHP has been provided with enclosures, side claddings and sprinklers. PA submitted that Installation of Comprehensive mist sprinkler system is proposed for dust suppression and control of air pollution in crushers, along conveyors belt, transfer points, bunkers of CHP and the same is expected to commissioned by March' 2019.
vi.	Coal handing plant shall be operated with effective control measures viz. bag filters /water or mist sprinkling system etc. to check fugitive dust emission from crushing operations, conveyer system, transfer points etc.	
vii.	Ground water, excluding mine water shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.	PA agreed to comply with. Mine pit water is being used for mining operations. PA submitted application vide dated 13.06.2016 to Central Ground Water Authority (CGWA) for obtaining NOC (for dewatering of ground water for mining operations) as the mine workings intersected ground water table. Application is pending with CGWA. PA submitted that mine discharge water after internal usage is being supplied to nearby Thermal Power Plants for industrial purpose and local populace for irrigation & domestic purposes. As per the information provided, roof top harvesting system will be provided for transit hostel and dispensary. Also a pond of Additionally, a pond of 382.50 m³ has been provided for the collection of rain water near Yeshamba village.
viii.	Catch/garland drains and siltation ponds of appropriate size shall be constructed around the mine working, coal heaps and OB dumps to prevent run off of water and flow of sediments directly into the river and water bodies. Further, dump material shall be properly	Complying with. As per the details provided two catch drains have been provided at the toe of the waste dumps. The dimensions are: 1. 1100 mtrs (L) x 3.5 mtrs (W) x 1.8 mtrs (D) 2. 400 mtrs (L) x 3.3 mtrs (W) x 2.00

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	consolidated /compacted and accumulation of water over dumps shall be avoided by adequate channels for flow of silt into the drains. The drains/ponds so constructed shall be regularly desilted particularly before on set of monsoon and maintained properly. Sump capacity should also provide adequate retention period to allow proper settling of silt material. The water so collected in the sump shall be utilized for dust suppression measures and green belt development. Dimension of the retaining wall constructed if any at the toe of the OB dumps within the mine to check run-off and siltation should be based on the rainfall data. The plantation of the native species to be made between toe of the dump and adjacent field/habitation/water bodies.	mtrs (D) PA submitted that the catch drains are desilted prior to monsoon. Garland drains have been provided around the quarry area with following dimensions: 1. 3100 mtrs (L) x 4.75 mtrs (B) x 2.25 mtrs. (D) 2. 450 mtrs (L) x 5 (B) mtrs x 1.6 mtrs (D). As per the details provided embankment of length 5700 meters (width 30 meters and height of 6 meters) has already been constructed along the mine boundary towards the river side. PA submitted the present embankment will be extended by 1500 meters for protection for future working area.
ix.	Industrial waste water generated from CHP, workshop and other waste water shall be properly collected and treated so as to conform to the standards prescribed under Environment Protection Act 1986 and the rules made there under and as amended from time to time. Oil and grease trap shall be installed and maintained fully functional with effluents discharged adhering to the norms. Sewage treatment plant of adequate capacity shall be installed for treatment of domestic waste.	Complying with. ETP of 100 KLD has been provided for the treatment of wastewater generated from the workshop. As per the monitoring data, the treated water quality found to be within the prescribed limits. Treated water is being reused in vehicle washing. Septic tanks and soak pits have been provided in the colony. PA submitted that STP based on MBBR technology will be installed for the colony.
x.	Adequate ground water recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby villages in case the village wells go dry due to dewatering of mine.	PA agreed to comply with. As per the information provided, roof top harvesting system will be provided for transit hostel and dispensary. Also a pond of Additionally, a pond of 382.50 m³ has been provided for the collection of rain water near Yeshamba village. PA submitted that mine discharge water after internal usage is being supplied to nearby Thermal Power Plants for industrial purpose and local populace for irrigation & domestic purposes.

(d) Illumination, noise & vibration

i.	Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. Report on the same shall be submitted to this ministry and its RO on six monthly	PA agreed to comply with. As per the information provided illumination is being maintained as per the DGMS notification no. DGMS(Legis.)

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	basis.	Circular no. 02 of 2017 Dhanbad dated 06.11.2017.
ii.	Adequate measures shall be taken for control of noise levels below 85 dBA (A) in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc. shall be provided with personal protective equipment (PPE) like ear plugs/muffs in conformity with prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.	Complying with. Earplugs and muffs have been provided for the workers engaged in drilling, blasting and HEMM operations. Noise levels are being monitored at 4 locations. As per the monitoring data, the noise levels found to be within prescribed standards.
iii.	Controlled blasting techniques should be practiced in order to mitigate ground vibrations and fly rocks as per the guidelines prescribed by DGMS.	Complying with. Controlled blasting is being carried out as per the DGMS guidelines. Delay detonators are being used to arrest the fly rocks and boulders.
iv.	The noise level survey shall be carried out and per the prescribed guidelines to assess noise exposure of the workman at vulnerable points in the mine premises and report in this regards shall be submitted to the ministry of /RO on six monthly basis.	PA agreed to comply with. PA submitted that noise level survey will be carried out to assess the noise exposure at vulnerable points through National Institute of Miners' Health (NIMH), Nagpur.

(e) Occupational health and safety

i.	The Project Proponent shall undertake an Occupational Health Survey for initial and Regular Periodical medical examination of the workers engaged in the Project and maintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS Circulars. Besides being regular periodic checkup, 20% of the workers identified from workforce engaged in active mining operations shall be subjected to health checkup for occupation disease and hearing impairment, if any.	Complying with. Medical checkup of the employees is being carried out as per the following schedule: 1. Once in 5 years for the people under 45 years of age 2. Once in 3 years for the people over 45 years of age PA submitted that initial (IME) and periodical medical examination (PME) is being carried out for permanent and outsourced employees. As per the information provided 56 IME and 133 PME has been carried out till date. Details of the medical examination are being submitted to Regional Office along with six monthly compliance report.

		PA submitted that medical examination of 20% work force will be carried out through external agency.
ii.	Personnel (including outsourcing employee) working in dusty areas should wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects	Complying with. Regular training is being provided for the workers at the vocational training centre on health and safety (as per DGMS norms) aspects. Personnel (including outsourced personnel) engaged in core zone operations are being provided with PPE like dust masks.
iii.	Skill training as per safety norms specified by DGMS shall be provided to all workman including the outsourcing employee to ensure high safety standards in mine.	
(f) Ecosystem and biodiversity conservation		
i.	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered flora/fauna, if any, spotted in the study area. Action plan in this regard if any shall be prepared and implemented in consultation with the State Forest and Wildlife Department.	PA submitted that as per EIA/EMP Studies no endangered flora & fauna species are reported and till date in the project area.
(g) Public hearing, R&R and CSR		
i.	Implementation of Action Plan on the issues raised during the Public Hearing shall be ensured. The Project Proponent shall undertake all the tasks and measures as per the Action Plan submitted with budgetary provisions during the Public Hearing. Land oustees should be compensated as per the norms laid out in the R&R Policy of the Company/ State Government/Central Government as applicable.	PA agreed to comply with. Project is carrying out CSR activities in nearby villages for the development of the infrastructure, water supply facilities, social empowerment, education, tarring of roads. As per the details provided an amount of Rs. 280.72 Lakhs has been spent on CSR activities from 2010-11 to till date. R&R Details: • Project Affected Families to be rehabilitated: 841 • Cost of land for rehabilitation: Rs.182.80 Crores • Land allotted: 21.66 ha. • Total no. of house holders: 721 • Already shifted to new rehab site: 400 • Employment provided: 13
ii.	The project proponent shall ensure the expenditure towards socio economic development in and around the mine, in every financial year in pursuance of the Corporate Social Responsibility Policy as per provisions of under Section 135 of the Companies Act, 2013.	

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		• Monetary compensation: 14 Following amenities have been provided: 1. Primary School, Primary Health Center and Gram Panchayat Office 2. WBM road 3. Overhead tank of 2 lakhs liters 4. 2 no.s of Bore wells have been provided for drinking water 5. Plantation of 1100 trees completed 6. 2 no.s of cattle shed have been provided 7. Bank and Post Office
iii.	The project proponent shall follow the mitigation measures provided in this Ministries Office Memorandum No.Z-11013/57/2014-IA.11 (M), dated 29th October, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area".	There is no village/habitation within the lease area. Nearest village Gondegaon is under rehabilitation. PA submitted that necessary mitigation measures are being taken to avoid impacts of mining on nearby villages.
iv.	The Project Proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State Government to provide alternate areas for livestock grazing, if any. In this context, Project Proponent shall implement the directions of the Hon'ble Supreme Court with regard to acquiring grazing land.	As per the information provided, no grazing land is involved in the project area.

(h) Corporate Environment responsibility

i.	The Company should have a well laid down Environment Policy approved by the Board of Directors. The Environment Policy should prescribe for standard operating process/procedures to bring into focus any infringements /deviation/violation of the environmental or forest norms/conditions also, the company shall have a defined system of reporting non-compliances/violations of environmental norms to the Board of Directors and/or shareholders /stakeholders.	Copy of the environmental policy is enclosed as Annexure-1 .
ii.	The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions should be displayed on website of the	

	Company	
iii.	A separate environmental management cell both at project and company head quarter level, with suitable qualified personnel shall be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.	Complying with. Environmental management cell has been established at corporate level as well as project level.
iv.	Action plan for implementing EMP conditions shall be prepared and duly approved by competent authority. The year wise funds earmarked for environmental protection measures should be kept in separate account and not be diverted for other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with six monthly compliance report.	Complying with. As per the details provided, PA earmarked amounts of Rs. 147.09 Lakhs and Rs. 6/tonne of coal produced for capital and revenue expenditure for environmental protection measures. PA submitted that an amount of Rs.431.09 Lakhs has been spent over environmental protection measures till date under revenue expenditure. Also Rs.131.37 Lakhs have been spent under capital expenditure.
v.	Self-environment audit shall be conducted annually. Even three years third party environment audit shall be carried out.	PA agreed to comply with.
(i) Statutory Obligations		
i.	The environmental clearance shall be subject to orders of Hon'ble Supreme Court of India, Hon'ble High Court, NGT and any other Court of Law from time to time, and as applicable to the project.	PA agreed upon.
ii.	This environmental clearance shall be subject to obtaining wide life clearance, if applicable, from the standing committee of National Board for wild life.	No forest land is involved. There are no eco-sensitive areas within 10kms of the project.
iii.	The project Proponent shall obtain Consent to Establish/Operate under the Air Act, 1981 and the Water Act, 1974 from the concerned State Pollution Control Board.	MPCB granted consent to establish for expansion of coal mining activity from 2.5 MTPA to 3.5 MTPA vide letter no. BO/CAC Cell/UAN no. 0000041397/ R/ CAC-1804000354 dated 07/04/2018. Application regarding Consent to Operate for capacity upto 3.5 MTPA was submitted to MPCB on 30.01.2018 and the same is pending with MPCB.
iv.	The Project Proponent shall obtain the necessary prior permission from the Central Ground Water Authority.	PA agreed to comply with. Application for grant of NOC for dewatering of Groundwater has been applied vide WCL/ENV/HQ / 27J & 17 E / 263 dated 13.06.2016. Application is

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		pending with CGWA.
(j) Monitoring of Project		
i.	Adequate ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring of the pollutants, namely PM10, PM2.5, SO2 and NOx. Location of the station shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Online ambient air quality monitoring stations may also be installed in addition to the regular monitoring stations as per the requirement and/ or in consultation with the SPCB. Monitoring of the heavy metals such as Hg, As, Ni, Cd, Cr, etc. carried out at least once in six months.	Complying with. Ambient air quality is being monitored at 5 locations through Central Mine Planning & Design Institute (CMPDI) Limited, Regional Institute, Nagpur. As per the monitoring data, the air quality levels found to be within prescribed standards. Also the heavy metal levels in ambient air quality were monitoring during April 2018. Monitoring reports are being submitted to Regional Office along with six monthly compliance report.
ii.	The ambient air quality monitoring in the core zone shall be carried out to ensure the Coal Industry Standard notified vide under GSR 742 (E) dated 25.09.2000 and amended from time to time by Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr, etc. and other monitoring data shall be regularly reported to the Ministry/ Regional Office and to the CPCB/SPCB.	
iii.	The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Coal Industry Standards of GSR 742 (E) dated 25.09.2000 and as amended from time to time by Central Pollution Control Board.	Complying with. ETP of 100 KLD has been provided for the treatment of wastewater generated from the workshop. A sedimentation pond has been provided for the treatment of mine pit water. As per the monitoring data, the treated water quality found to be within the prescribed limits.
iv.	The monitoring data shall be uploaded on the company website and displayed at the project site at a suitable location. The circular no.J-20012/1/2006/1A.11(M) dated 25.09.2000 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this	Complying with. Environmental monitoring reports are being uploaded onto company's website regularly.

	regard for its compliance.	
v.	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring of ground water level shall be carried four times in a year pre- monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year and the data thus collected shall be sent regularly to Ministry of Environment, Forest and Climate Change /Regional Office.	Complying with. Ground water level and quality are being monitored through Central Mine Planning & Design Institute (CMPDI) Limited, Regional Institute, Nagpur at 13 locations four times in a year. Monitoring data is being submitted to Regional Office as per the stipulation.
vi.	Monitoring of water quality upstream and downstream of water bodies shall be carried out once in 6 months and record of monitoring data shall be maintained and submitted to Ministry of Environment, Forest and Climate Change /Regional Office.	Complying with. Monitoring is being carried out at three locations of Kanhan River comprising of 1 upstream location (near sangham) and 2 downstream (mine discharge point, and near Juni Kamptee) locations. Last monitoring was carried out in June 2018. Monitoring reports have been submitted to Regional Office along with six monthly compliance report.
vii.	Project proponent shall submit six monthly reports on the status of the implementation of the stipulated environment conditions to the Ministry of Environment, Forest and Climate Change and its Regional Office. For half yearly monitoring reports data should be monitored for the period April to September and October to March of the financial years.	Complying with. PA submitted the six monthly compliance reports regularly since the grant of EC.
viii.	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data/information / monitoring reports.	PA agreed upon.
(k) Miscellaneous		
i.	Efforts should be made to reduce energy consumption by conservation, efficiency, improvements and use of renewable energy.	PA agreed to comply with. As per the information provided rooftop solar system has been installed for office and residential buildings which resulted in

		reduction in power consumption by 1108290 KWH.
ii.	The project authorities shall inform to the Regional Office regarding commencement of the mining operations.	This is an existing mine.
iii.	A copy of Environment clearance letter shall be marked to concern Panchayat. A copy of the same shall be sent to the concerned State Pollution Control Board, Regional Office, District Industry Sector and Collector's Office/ Tehsildar Office for information in public domain within 30 days.	Complied. Copy of the environmental clearance has been submitted to Gondegaon Gram Panchayat vide letter dated 10.04.2018.
iv.	The EC shall be uploaded on the company's website. The, compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in public domain.	Complying with. PA uploaded the copies of environmental clearance as well as the six monthly compliance report to company website.
v.	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment, Forest and Climate Change at www.environmentclearance.nic.in and a copy of the same should be forwarded to the Regional Office.	Complied. Advertisement has been made as per the stipulation.
vi.	The Environmental Statement for each financial year ending 31 March in Form-V is mandated to be submitted by the Project Proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the Company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF & CC by e-mail. Concerns raised during public hearing.	Complying with. Environment statement has been submitted to MPCB on 20.09.2018. Copy of the same has been uploaded to company website. Also the same has been submitted to Regional Office along with six monthly compliance report.

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vii.	The above conditions will be enforced inter alia under the provision of the Water Act, 1974 and Air Act, 1981, Environment Protection Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and their Rules and any other order passed by Hon'ble Supreme Court of India /High courts and any other court of law to the subject matter.	PA agreed to comply with.
5.	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during presentation to the EAC. All the commitments made on the issue raised during public hearing shall also be implemented in letter and spirit.	PA agreed to comply with.
6.	The proponent shall obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection.	PA agreed to comply with.
7.	Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	PA agreed to comply with.
8.	Any appeal against this environmental clearance shall lie with the National green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National green Tribunal Act, 2010.	PA agreed to comply with.
9.	The coal company/project proponent shall be liable to pay the compensation against the illegal mining, if any, and as raised by the respective State Governments at any point of time, in terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP (Civil) No. 114/2014 in the matter of 'Common Cause Vs Union of India & others'.	PA agreed to comply with.
10.	The project proponent, without prejudice to this EC, shall be bound to comply with any other interpretation of the orders of Hon'ble Supreme Court also, in due course of time.	PA agreed to comply with.

11.	This EC supersedes the earlier EC granted vide Letter No. J-11015/106/2009-IA.II(M) dated 15TH July, 2009 for 2.5 MTPA capacity to Gondagaon OCP in a Total area of 917 ha.	PA agreed to comply with.

A. Suresh Kumar
21/01/19

Scientist 'D'
SURESH KUMAR ADAPA

वैज्ञानिक 'डी'
SCIENTIST 'D'

पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change

क्षेत्रीय कार्यालय (परिवहन राज्य क्षेत्र)
Regional Office (WCZ)

नागपुर / Nagpur - 440001

22/5

Summary Note

1. Implementation of Conditions:

Site inspection has been carried out on 03.01.2019. Ministry granted environmental clearance vide letter dated 14.03.2018 for the project for expansion of coal mine from 2.5 MTPA to 3.5 MTPA for a period of one year. Maximum production achieved till date is 3.16 million tonnes during 2017-18. As per the details provided, construction works at rehabilitation site of the Gondagaon village completed and 400 families already shifted to the rehabilitation site. Backfilling of mine out area is in progress. An area of 9.950 ha has been backfilled up to ground level and about 31 ha. area is under backfilling. Plantation has been carried out over an area of 128.2 ha. Embankment of 5.7 km provided for the Kanhan River. Water sprinkling system has been provided for the coal handling plant, haul roads, coal stock yards. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondagaon has been started by MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.

2. Review w.r.t to MOEFs letter dated 30.5.2012:

The above mentioned report is prepared after site visit on 03.01.2019 for the extension of validity of environmental clearance issued for expansion of Gondagaon OCP (from 2.5 MTPA to 3.5 MTPA) of Western Coalfields Limited, Dist. Yavatmal, Maharashtra. Compliance status is based on the observations made during the site visit.

3. Court Cases and show cause/closure notices:

PA submitted undertaking that

- i. There are no court cases pending against the project
- ii. There are no show cause notices issued by MPCB are pending against the project.

MPCB granted consent to establish for expansion of coal mining activity from 2.5 MTPA to 3.5 MTPA vide letter no. BO/CAC Cell/UAN no. 0000041397/ R/ CAC-1804000354 dated 07/04/2018.

Application regarding Consent to Operate for capacity upto 3.5 MTPA was submitted to MPCB on 30.01.2018 and the same is pending with MPCB.

4. Uploading of compliance on web site: With regard to uploading of EC and compliance of conditions along with analytical reports on the web site of the company, PA uploaded the copies of EC, compliance and analytical reports to the website.

A. Surash Kumar
21/01/19
सुरेश कुमार अदपा
SURESH KUMAR ADAPA
वैज्ञानिक 'डी'
SCIENTIST 'D'
पर्यावरण, वन एवं जलवायु परिवर्तन विभाग
Ministry of Environment, Forest & Climate Change
औद्योगिक क्षेत्र (पश्चिमी चम्पा) क्षेत्रीय कार्यालय (WCL)
Regional Office (WCL) 23/5



COAL INDIA LIMITED

CORPORATE

ENVIRONMENTAL

POLICY

2012





Environmental Policy Statement:

Coal India Limited (CIL) is committed to protect the environment through prevention, mitigation of pollution, proper disposal and recycling of wastes, conservation of bio-diversity and bringing awareness among all its stakeholders for continual improvement in environmental performances following the best practices.

OBJECTIVES:

Coal India Limited shall endeavour to:

- 1. Conduct mining and associated operations in an environmentally responsible manner to comply with applicable laws and other requirements related to environmental aspects and Design Projects with due consideration of Sustainable Development.**
- 2. Prevent pollution of surrounding habitation by continuous monitoring and adopting suitable measures for environment protection.**
- 3. Ensure compliance of Environment Clearance (EC) and Forestry Clearance (FC) conditions and other statutory conditions issued by regulatory agencies.**
- 4. Implement Environment Management Plans (EMP) in all mines effectively to mitigate pollutions of air, water, noise and land caused by mining operations.**
- 5. Strive to conserve bio-diversity.**
- 6. Conserve natural resources through the principle of REDUCE, REUSE, RECYCLE, REDEFINE and REPLACE. Put special thrust on efficient energy utilization as a measure to reduce carbon foot-print.**
- 7. Strive for continual improvement in our environmental performances by setting targets, measuring progress and taking corrective actions.**
- 8. Create awareness about environment among the employees and the local communities through pro-active communication and training.**

Strategies for Implementation of Environmental Policy:

Back Ground:

CIL subscribes to the view of Sustainable Development. Unless the environment can sustain the developmental activities, any pursuit of development in isolation can cause irreparable damage to the ecosystem and associated environmental attributes. Keeping this view in mind, CIL attaches top priority towards eco-friendly sustainable development and approved its 'Corporate Environmental Policy' in December 1995. However, the present policy is the amendment of 1995 Policy and is complimentary to the National Environmental Policy.

The modification in the present policy is the outcome of the experiences gained since 1995 and incorporating the modifications / amendments made time to time in environmental policies and additional requirements notified by Ministry of Environment & Forest (MOEF) and other statutory organisations concerning mine closure, reclamation of degraded land, environmental & forestry clearance etc. and also with the objective of revisiting the corporate policy.

This Policy has a vision of Green Mining and mission of 100% compliance of environmental statutes applicable to coal mining industry.

Strategies: CIL adopts the strategies appended below for effective implementation:

1. Mine Planning on Sustainable Development:

- a) Coal, being a non-renewal energy source, extraction shall be planned prudently to meet national requirement. The projects shall be designed on the principle of Sustainable Development with due consideration to environment, safety and aspirations of the stakeholders at the planning stage itself.
- b) While preparing the Project Reports, the efforts shall be to incorporate latest mining equipments with higher capacity and mining technologies those are more environments friendly.

2. Environmental Impact Assessment (EIA) & Environment Mitigation Plan (EMP)

- a) Mining shall be carried out to facilitate the maintenance of stipulated environmental standards of quality of various pollutants within the limits under the relevant acts, statutes and National Environmental Policy 2006.
- b) EIA and EMP for all new and existing mines, washeries, central and regional workshops and other industrial units shall be formulated as per MoEF guide lines for obtaining Environmental Clearance (EC). Similarly, in the existing projects for enhancement of production capacities with or without increase in land, change of technology and renewal of lease etc. fresh EC is required to be sought as per norms. Further, the operations in these units shall be guided by the consent letters for air and water issued by the respective State Pollution Control Boards (SPCB).
- c) Detailed Mine Closure Plans shall be prepared for all existing and new mines as per the MoC (Ministry of Coal) guidelines.

3. Compliance of the statutory requirements:

The implementation of EMP and fulfillment of all other statutory requirements like conditions of EC, FC and consents to establish & operate, including timely submission of returns to statutory bodies and various agencies, are to be ensured at all levels.

4. Measures to mitigate pollution:

a) Air Pollution:

- i) Generation of dust is to be controlled at the source to the possible extent with necessary measures during drilling, loading, unloading, CHP transfer points etc.
- ii) Dust generation is to be minimized along coal / waste transportation roads.
- iii) Green belt is to be created around the source of dust.

b) Water Pollution

i) The mine water and other effluent shall be treated effectively to ensure the discharge norms as per statute. The treated effluent shall be utilized to the extent possible with a view to achieve maximum water conservation.

ii) Oil & grease from the effluent shall be removed by Oil & Grease Traps.

c) Noise / ground vibration:

i) All measures to minimise noise pollution will be taken including provision of ear muffs / plugs etc. and rotation of place of deployment.

ii) Controlled blasting techniques shall be followed to reduce ground vibration as well as noise pollution.

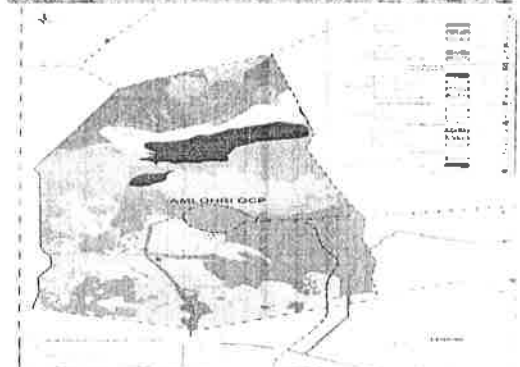
d) Land Reclamation:

i) Progressive and concurrent reclamation of mined out areas will be carried out as per approved EMP and Mine Closure Plan (MCP).

ii) Slopes of external dumps are the important area to be suitably graded / terraced for effective reclamation and plantation.

iii) Preservation of top soil is required for future use. Old as well as existing non-active dumps are to be technically and biologically reclaimed through scientific studies.

iv) Monitoring of reclamation work of all coalfields and opencast mines will be done through Satellite Surveillance. The outcome shall be put in the websites.



e) Mine Closure Plans:

Detailed MCP shall be prepared for each mine. MCP are being delineated in two phases viz. progressive and final mine closure. Appropriate funds are set aside and deposited under a special Escrow fund every year as per MoC guidelines to be utilized for proper and final mine closure.

f) Mine Fire:

CIL shall endeavour to reduce occurrence of mine fire and subsidence in built-up areas. Action Plan for mine fire control shall be implemented. Monthly report shall be submitted to top management of the subsidiary and CIL and Quarterly to company board. Monitoring will be done through Satellite Surveillance.

g) Monitoring:

- i) All receptors in and around the mining projects will be monitored regularly to assess the efficacy of the pollution control / mitigation measures to ensure air & water quality and noise level within standards.
- ii) Effect of mining on the hydrology of the area will be monitored through measurement of water level and its quality of nearby wells and bore holes provided for this purpose. Conservation of water through rain water harvesting shall be taken up.
- iii) Area and unit environmental cells shall have regular interaction with the people in and around the coal mines and other allied units on matters related to environment to take necessary and timely corrective actions.
- iv) Environmental initiatives and monitoring through Internal Environmental Audit will be conducted for generating useful data for taking corrective actions and mitigation measures.
- v) The annual budget (revenue & capital) shall be prepared based on the action plan including monitoring of various bench marks and the budget utilisation.

h) Other measures:

- i) Special emphasis shall be given to undertake R&D related to various facets of coal mine environmental management in collaboration with Central Mine Planning and Design Institute (CMPDI) and other competent institutions.
- ii) Besides ensuring statutory compliance, the CIL desires to set high standards and continual improvement.
- iii) A number of mines and establishments of CIL are ISO 14001 certified and balance mines and establishments shall be ISO 14001 certified in phased manner.

5. Preservation of bio-diversity:

- a) This will start from mine planning including technically and biologically reclamation of mined out areas in collaboration with State Forest Departments, Wild Life Divisions, NGOs etc. working in the fields of bio-diversity conservation.
- b) The selection of species for plantation shall be done in consultation with the local community to include the local species and their preferences, if any.

6. Coal Beneficiation / Coal washeries:

- a) For beneficiation of Run off Mines (ROM) coal, washeries are being set up in a phased manner as per requirement.
- b) Slurry Management System (SMS) in all washeries shall be organised to ensure collection of fines, gainful utilization of rejects viz. power generation in Fluidized Bed Combustion (FBC) plants, selling to brick manufacturers or adopting other environmental friendly disposal options.
- c) The reject dumps and tailings shall be suitably treated to avoid any contamination.
- d) The effluent from washeries including tailings pond shall be suitably treated and reused to minimize water consumption with zero discharge concept.

7. Conservation and Clean Technology:

- a) R&D projects shall be taken up to promote clean coal technology and improve the existing technologies.
- b) Energy saved is energy produced. A system may be evolved to conduct regularly energy audit voluntarily to take corrective actions to reduce carbon foot print.
- c) Clean Development Mechanisms will be explored for reducing emission of Green House Gases by exploration, identification, preparation of projects reports for extraction of methane from Coal Bed, Coal Mine, Abandoned Mine, Ventilation Air, UG Coal Gasification, generation and utilisation of renewable energy etc.



8. Awareness Programmed:

- a) Publicity and propaganda to generate awareness through exchange & communication of information, news letters and periodicals on environment, seminars, work-shops, celebration of World Environment Day etc. at CIL / Subsidiary HQs, Areas & units shall be undertaken. Regular training programmes will be organised at various levels to inculcate awareness among employees.
- b) Courses on environmental and forestry laws and Environmental Protection Measures and the corporate Policy shall be organised for project executives for improving knowledge.
- c) CIL shall give annual awards for achieving excellence in environment related issues and activities. These awards will be in recognition for implementation

of EMP, land reclamation and compliance of statutes, proper maintenance of air & water quality and noise level.

Implementation of Policy:

i) **Manpower:** CIL shall have environmental divisions at decision making & operational levels in its structure. The environment department shall be set up and strengthened at:

- i) CIL Corporate HQ at Kolkata
- ii) Subsidiary HQs
- iii) Areas / Units / Collieries / Workshops / Washeries
- iv) CMPDI (HQ) & CMPDI Regional Institutes

ii) **Roles and Responsibilities:** The environmental department, set up at company HQs, Areas and Unit levels with appropriate manpower and resources, shall be responsible for implementation of policy, obtaining EC, FC, consent to establish & operate, statutory requirements and undertaking mitigation measures besides preparation of action plan every year and also to intimate the status of implementation to the management regularly.

Possibilities of entering into joint Venture with the agencies having expertise on the Mine reclamation activities are to be explored.

iii) **Funding the environmental activities:** For projects having approved EMPs, the capital and revenue fund provision for environmental activities has been provided in its project report. For other units, suitable provision shall be kept in the revenue budget as per the requirements. The fund earmarked shall be spent exclusively on environmental purposes and measures only.

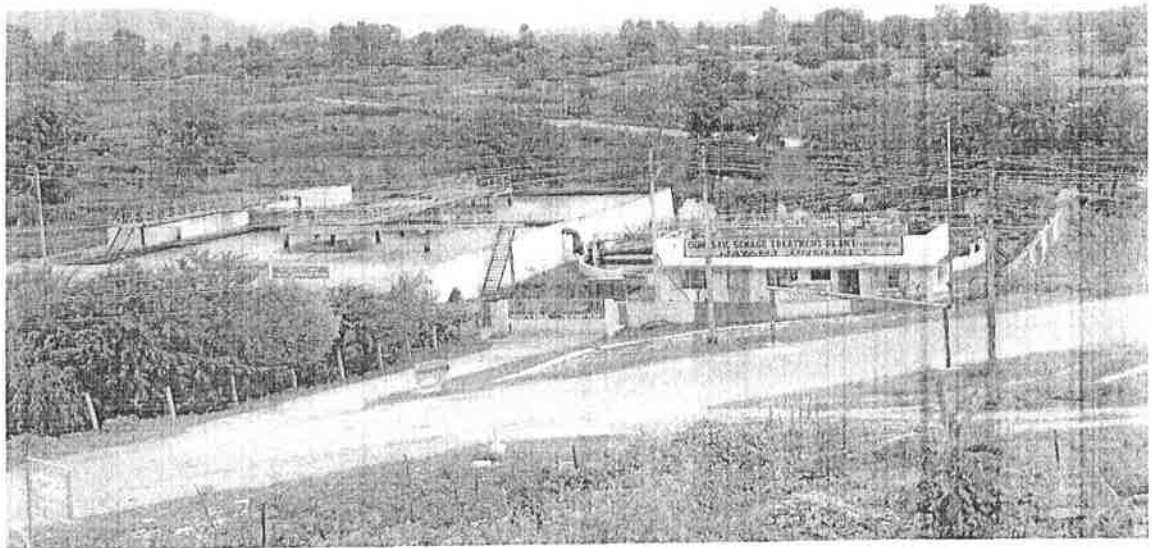
As per the guidelines of MoC, the cost of mine closure shall be provided in the mine closure plan and deposited as ESCROW fund which shall be utilized for mine closure activities.

iv) **Environmental Cost Code:** As a policy, the cost code for environment related activities has been put in place, for generation of data on expenses incurred for environmental safeguards. This will help to monitor cost effectiveness of

environmental control measures undertaken and help frame future budget provisions.

Review of Environmental Policy:

In view of the present fast changing social, economic and environmental scenario, this Policy shall be reviewed every 5 years to incorporate the changes in the legal, technical, environmental, economic and social inputs prevailing at that time. Whenever, there is change in National Environmental Policy or other National / State relevant policies, Acts etc, this Corporate Environmental Policy would be reviewed and suitably revised.



Western Coalfields Limited

(Kasturba Nagar, Jaripatka, Nagpur - 440 014.)
(A Subsidiary of Coal India Limited)

Office of the Sub Area Manager
Gondegaon Sub Area, Nagpur Area

उप क्षेत्रीय प्रबंधक का कार्यालय
गोंडेगाव सब एरिया, नागपुर एरिया

Ref no.WCL/GM(M)/SAM/GSA/2018/

Date 10.09.2018

CERTIFICATE/UNDERTAKING

This is being certified that no court cases/show cause notice case is pending related to the Environment Activities of the Expansion of Gondegaon Extension Open Cast Coal Mine Project of Nagpur Area of WCL.


GM (M)/Sub Area Manager,
Gondegaon Sub Area,
Nagpur Area, WCL

35/35

MAHARASHTRA POLLUTION CONTROL BOARD

Ph.No. 2560139
Fax No. 2560851
E-mail:- sronagpur1@mpcb.gov.in

Sub-Regional Office-I,
5th Floor, Udyog Bhawan,
Civil Lines, Nagpur.

NO.MPC/SRN-I/ 169 /2019

Date:- 23/01/2019

To,
Area General Manager, Nagpur Area
Gondegaon Opencast Coal mine, Gondegaon
M/s Westen Coalfields Ltd. Nagpur

Sub:- Compliances of issues raised during public hearing of Gondegaon opencast mine.

Ref :- 1) Minutes of public hearing date 26.04.2005

2) Visits of MPC Boards officials.

3) Your letter Dated 19.01.2019

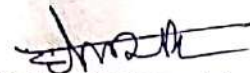
Sir,

This is in reference to your letter regarding compliance of issues raised during public hearing of Gondegaon Opencast mine held on 26.04.2005

It was observed during visits to the area and documents submitted by mine project authority is complying with issues raised during public hearing specially regarding, Air, water pollution control and ecological balance, ground water recharging as tree plantation, creating percolation tanks and rain water harvesting systems, tarring /concrete of coal transportation road and along with avenue plantation on coal transportation roads. Mine project authority are observed in process to install CAAQMS Station.

WCL project authority shall continuous maintenance of all above works for pollution control and environmental protection in the surrounding area.

Yours Faithfully



(Hema Deshpande)
Sub-Regional Officer-I,
M.P.C.Board, Nagpur.

SUBMISSION OF
PUBLIC HEARING COMPLIANCE REPORT

DATED 26.04.2005

for

EXPANSION OF GONDEGAON EXTENSION OC COAL MINE PROJECT

(2.50 MTPA to 3.50 MTPA)

ENVIRONMENTAL CLEARANCE ISSUED BY MOEF &CC, NEW DELHI

(VIDE LETTER NO. J-11015/106/2009-IA-II(M) DATED 14.03.2018)

FROM MOEF&CC, NEW DELHI



WESTERN COALFIELDS LIMITED

(A Govt. of India Miniratna Company)

**OFFICE OF THE SUB AREA MANAGER, GONDEGAON SUB AREA
POST-GONDEGAON, TEH.-PARESHONI, DISTT.NAGPUR (M.S.)**

**Compliance Report of Minutes of Public Hearing held on
26.04.2005**

Time 11:30 AM

Venue: Bachat Sabhagriha Collectorate, Nagpur

Expansion of Gondegaon Extension OC Coal Mine Project.

LIST OF ENCLOSURES

Annexure	Documents	Page No.
I	Minutes of Public Hearing held on 26.04.2005	
II	Compliance of Minutes of Public Hearing held on 26.04.2005	
A	Pollution Control Measures at project	
B	Photos of site for rooftop rainwater harvesting Structure	
C	Details of year-wise plantation carried out	
D	CSR Activities carried out	
E	Employment and R&R Details of Mine	
F	Air and Water Quality Monitoring Report	

***Minutes of Public Hearing held on
26.04.2005 for Gondegaon OC
Project***

MINUTES OF PUBLIC HEARING

ANNEXURE - XI

Sub: - Public Hearing for Environmental clearance for Gondgaon Open Cast Extension, Western Coalfields Limited Tah: Parseoni, Dist: Nagpur, Maharashtra

Venue: Bachat Sabhagriha, Collectorate, Nagpur

Date: 26-04-2005

Time: 11.30 a.m.

The Environmental Public Hearing for Western Coalfields Limited, Gondgaon Open Cast Extension Mine was conducted on 26-04-2005 under the chairmanship of Hon'ble Additional District Collector, Nagpur. The advertisement for this public hearing was published in local newspapers as per the notification (Annexure-I)

- The Hitavada, Nagpur (English) dated 23-03-2005.
- Dainik Lokmat, Nagpur (Marathi) dated 23-03-2005.

The public hearing panel was formed, as per MPCB office order No.E-33 of 2005 vide letter No. BO/PO(P&P)/PH/B-1425 dated 19-03-2005. (Annexure-II)

The following members of the public hearing panel were present at the time of public hearing (Annexure-III).

1	Smt. Anshu Sinha, IAS, Additional District Collector, Nagpur	Chairman
2	Shri. Ajay Gulhane, Deputy Collector, Nagpur	Member
3	Representative of Geology & Mining Govt. of Maharashtra, Nagpur	Member
4	Shri V.M.Motghare, Regional Officer, MPCB, Nagpur	Member
5	Shri Udaybhan Yadav At.Gondgaon Ta.Parseoni Dist. Nagpur	Member
6	Shri Nathuji Tikle At.JunikampteeTa.Parseoni Dist. Nagpur	Member
7	Shri Tejram Sarile At.Ghatrohna Ta.Parseoni Dist. Nagpur	Member
8	Smt. Sulochanabai Kadnaike At.Gondgaon Ta.Parseoni Dist. Nagpur	Member
9	Shri Daulotrao Waghamare At.Gondgaon Ta.Parseoni Dist. Nagpur	Member
10	Shri A.J.Kude, Sub Regional Officer-I, MPCB Nagpur	Convener

Representatives of NGOs, Sarpanch of Villages, Agriculturists of affected area and representatives of project proponent were present in the public hearing. The attendance sheet is enclosed. (Annexure-IV)

Shri V.M. Motghare, Regional Officer, MPCB Nagpur welcomed all the members of public hearing panel, officials, NGOs, agriculturists, representatives of the project proponent and sought the permission from the Chairman to initiate the proceedings. He briefed the importance regarding the environmental clearance and public hearing procedures and advised all the people present in the public hearing to come with their views and comments on the project to ensure that the objectives of the public hearing are fulfilled.

Shri P.K. Gandhi, Senior Environment Engineer, WCL, Nagpur explained the details of the project including area covered under the project, capacity of coal production, details of mining, impact of dewatering on surrounding area and uses of mine water. He also mentioned details regarding various precautionary measures taken in the project to protect environment from water pollution, air pollution & noise pollution and community development activities initiated by the project proponent.

The Regional Officer, MPCB Nagpur asked the members, representatives of the NGOs, agriculturists present in the public hearing to submit their written and oral objections.

Shri. Siddhartha Gajbhiye, Grampanchayat Member Vill. Gondagaon Tal. Parsooni, Dist. Nagpur enquired that.

1. When and on what date the Gondagaon Village will be rehabilitated?

Shri. Kishore Belsare, Chairman of Gondagaon Project Affected Committee has raised following points.

1. Land cost so far not paid till date to the land affected person.
2. As per old agreement WCL has to complete the old work on top priority.
3. Some persons of Vill. Gondagaon till date not got the job though their land is acquired by WCL.

Shri. Sarile, Sarpanch Grampanchayat, Ghatrohana, Tq. Parseoni, Dist. Nagpur has raised the following points.

1. As the Gondagaon extension mine comes in the vicinity of Ghatrohana Village the land is to be acquired from Ghatrohana Village & thus land compensation as per the rules shall also be applicable to the Ghatrohana Villagers & Job preference shall also be extended to land affected persons.

Shri. Shivkumar Yadav, Member of Rehabilitation Committee of Gondagaon also raised the objection as mentioned above. He has pointed out that there is depletion of groundwater level due to mining activities.

The representative from WCL explained that the Air & Water pollution control measures are the basic parts of the mining activities & WCL authorities has clarified the issue & following commitments are given.

1. The Gondagaon Village is to be shifted within 2 years from the date of Public Hearing taking into the confidence of local village panchayat & in consultation with District Administration.
2. Land compensation and jobs will be as per the coal India & WCL rules.
3. Comprehensive study on depletion of ground water with CGWB due to mining activities is in advance stage & which will be completed within one year & the recommendation issued by CGWB will be strictly followed by WCL.

4. Mobile water tankers have been put into use for water sprinkling on haul road and coal transportation road & all drills are fitted with dust extractors
5. All Coal transportation road will have been black topped & water sprinkling arrangements will be installed.
6. Tree Plantation will be carried out Around CHP, Village boundary, along road and on over burden dumps etc.
7. Covering of coal transportation trucks by tarpaulin for all sides.
8. Sweeping /brooming of coal transportation road is also done regularly
9. Control blasting system is to be adopted with regular measurement through vibrometer & results shall be communicated to Local Grampanchayat & Pollution Control Board.
10. Kachha pond with proper drain is to be made for irrigation purposes to utilize water in proper way.

Chairman of the panel has directed WCL authority that the community development programme shall be taken exclusively by WCL from their own resources.

In light of the observations and considering the representations given by the villagers the Public Hearing Panel is of view that.

1. WCL shall carry out massive tree plantation especially between the roads leading to villages & mine, OB dumps and avenue plantation outside their area which will be helpful in maintaining ecological balance
2. WCL shall provide adequate fixed water sprinklers at CHPs, Coal transportation roads, weigh bridge, haul roads etc. to control fugitive dust emission

3. WCL shall ensure that, all the trucks carrying coal shall be covered with tarpaulins properly to avoid spillage of coal on the roads and overloading of coal shall be strictly avoided
4. WCL shall take care to avoid flood type situation in the adjoining villages due to overburden & suitable structure shall be provided to avoid the damage.
5. WCL shall take massive ground water table recharging works and effective utilization of mine water discharge for irrigation use at nearby villages. WCL shall also ensure that scarcity of water due to depletion of ground water level due to mining activities & they shall supply water to the affected villages.
6. WCL shall maintain overburden dumps to avoid nuisance to villages and carry out massive tree plantation on over burden & suitable structure shall be provided to avoid the damage.
7. WCL shall carry out blasting in the day time only using advanced technology to avoid ill effects due to blasting to nearby residents WCL shall also maintain the record of blasting using vibrometer.
8. WCL shall install continuous ambient air monitoring stations in the vicinity of the mines and adjoining villages.
9. WCL shall immediately initiate mass community development programmes in the vicinity of the affected villages in consultation with District administration, MPCB and local body and submit the yearly proposal for approval of the District administration

10. WCL should implement, above recommendations as suggested by the public hearing panel on priority basis.

The recommendation of the Chairman of the public hearing panel and Additional District Collector Nagpur is as below.

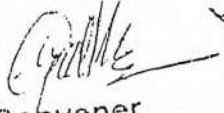
In view of the opinion of public hearing committee & representations made by villagers, WCL should initiate the action on following points.

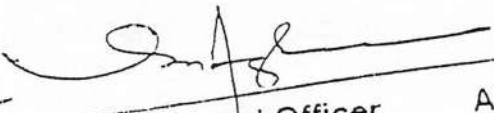
1. As recommended by the pollution control board, WCL shall take measures to control air, soil & water pollution to maintain ecological balance and environmental degradation, in surrounding area.
2. Due to mining water table in adjoining areas go down. WCL shall take exhaustive ground water recharging works for recuperation of ground water level and supply to the affected villages during scarcity of water.
3. To maintain ecological balance in the surrounding area WCL shall carry out massive tree plantation in open areas as well as avenue plantation on public roads.
4. As per the representation of the villages WCL shall take a repairing / tarring of roads where trucks are passing.
5. WCL Shall examine the representation submitted by Sarpanch to carry out social development works in affected villages in consultation with District administration.
6. It is recommended that the matter related to acquisition of land, employment if any should be done on priority basis.

7. The continuous Ambient Air quality monitoring station shall be installed in the mine premises & results shall be displayed at local panchayat & Maharashtra Pollution Control Board.

In the light of above facts, it is recommended that, WCL authorities carry out mass awareness programme & its implementation within a stipulated time of next six months. Conditional clearance granted subject to fulfillment of commitments of WCL & directions given in this regard within the stipulated time period. The provision of "Rejection of Clearance" should be incorporated in conditional permission if WCL authorities fail to redress the grievances within a period of six months.

Convener of the public hearing panel thanked the Chairman, Members of the panel, local people present during the public hearing


Convener
Sub Regional Officer-I
MPCB Nagpur


Regional Officer
MPCB Nagpur


Additional District Collector,
Nagpur &
Chairman of the
Public Hearing Panel

MAHARASHTRA POLLUTION CONTROL BOARD

Phone : 4010437 / 4014701 / 402
Fax : 4024068 / 4023516
Website : <http://mpcb.mah.nic.in>
E-Mail: mpcbslon@bom.nic.in



KALPATARU POINT, 3rd Floor
Slon-Matunga Scheme Road No.8,
Opp. Slon Circle, Slon (East)
Mumbai-400 022

NO.BO/PO(P&P)/PH/B-1426

Date : 19 / 03 / 2005.

OFFICE ORDER NO. 5-33 OF 2005.

In compliance of Notification No.318(E), dated 10-04-1997 & circular dtd. 12/02/2002 of Ministry of Environment and Forests, Government of India, the Public Hearing Panel for the proposed project, of M/s. Western Coalfields Ltd., Gondagaon Extension Opencast Mine, Tq. Parseoni, Dist-Nagpur is as follows :-

1)	District Collector, Nagpur. Dist.Nagpur.	Chairman
2)	Representative of Environment Department, Government of Maharashtra, Mumbai.	Member
3)	Representative of Geology & Mining Government of Maharashtra, Nagpur.	Member
4)	Regional Officer, MPCB, Nagpur.	Member

SENIOR CITIZENS :

5)	Shri. Udaybhan Yadav, At. Gondagaon, Tq. Parseoni, Dist-Nagpur.	Member
6)	Shri. Ramprit Prasad, At. Gondagaon, Tq. Parseoni, Dist-Nagpur.	Member
7)	Shri. Natthuji Tikle, At. Juni Kamptee, Tq. Parseoni, Dist-Nagpur.	Member

LOCAL BODY REPRESENTATIVES :

8)	Shri. Tejram Sarile, Sarpanch Ghatrihana, Tq. Parseoni, Dist.Nagpur.	Member

P.T.O.

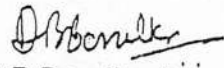
: 2 :

9)	Smt. Sulochanabai Kadnaik, Sarpanch , Gondagaon, Tq.Parseoni, Dist.Nagpur.	Member
10)	Shri. Daulatrao Waghmare Upsarpanch, Juni-Kamptee, Tq.Parseoni, Dist.Nagpur.	Member

Sub-Regional Officer-I, M.P.C.Board, Nagpur , will work as a Co-ordinator/Convener

The Public Hearing will be held on 26/04/2005 at 11.00 hrs. at Bachat Sabhagrih,
Collector Office, Nagpur.

The members are requested to make it convenient to attend the Public Hearing.


(D.B.Boralkar)
Member Secretary

Copy for information to :

- 1) The Secretary Environment Department , Govt.of Maharashtra.
Mantralaya, Mumbai-400032.
- 2) The Chairman, M.P.C.Board, Mumbai.
- 3) Representative of Geology & Mining, Govt. Of Maharashtra, Nagpur.

Copy for information to :

- 1) District Collector, Nagpur.
- 2) Members of Public Hearing Panel.
- 3) M/s. Western Coalfields Ltd., Gondagaon Extension Opencast Mine, Tq. Parseoni,
Dist-Nagpur

Copy for information & necessary action to :

- 1) Regional Officer, MPCB, Nagpur.
- 2) Sub-Regional Officer-I, MPCB, Nagpur.

ક્ર.સં	નામની સુચનાઓ અને સંબંધ	જુદી	સંકેત
૧)	શ્રી. પિત્તેશ્વરી આદિભારી	૨૦/૧/૧૫	૨૦/૧/૧૫
૨)	શ્રી. દેવદાસ આદિભારી	૨૦/૧/૧૫	૨૦/૧/૧૫
૩)	શ્રી. ઉદયભાઈ ગોંડલ	૨૦/૧/૧૫	૨૦/૧/૧૫
૪)	શ્રી. રામભાઈ ગોંડલ	૨૦/૧/૧૫	૨૦/૧/૧૫
૫)	શ્રી. રામભાઈ ગોંડલ	૨૦/૧/૧૫	૨૦/૧/૧૫
૬)	શ્રી. રામભાઈ ગોંડલ	૨૦/૧/૧૫	૨૦/૧/૧૫
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૧૦)	શ્રી. રામભાઈ ગોંડલ	૨૦/૧/૧૫	૨૦/૧/૧૫

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80	श्रीमती सुबोधकाशी ओडेगाई अ.प.प. गोंडगांव, ता. पारमिपनी जिला नागपुर	सदस्य ~~सुबोधकाशी~~	श्री सुबोधकाशी ओडेगाई गोंडगांव
81	श्री जयलक्ष्मी काशी अ.प.प.प. पुर्णिमागौरी ता. पारमिपनी जिला नागपुर	सदस्य	
82	श्री प्रभाकर गोंडगे पूर्वपक्ष समिती सदस्य गोंडगांव ता. पारमिपनी जिला नागपुर		~~गोंडगांव~~
91	श्री जयलक्ष्मी काशी पूर्वपक्ष समिती सदस्य गोंडगांव ता. पारमिपनी जिला नागपुर		~~गोंडगांव~~ 26/6/09
92	श्री भागीरथ नाईकु गोंडगांव		~~गोंडगांव~~
14	श्रीमती गीता देवी नाईकु गोंडगांव	गोंडगांव	गोंडगांव
15	श्रीमती लक्ष्मी देवी गोंडगांव	गोंडगांव	गोंडगांव
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ક્રમ નં	નામ	ડાટા	સહી
44	જાનકીલાલ દેવિલાલ ડાટ્ટ	દિગંધા (સામગ્રી)	જાનકીલાલ
50	કુમળોનામ મુંદા દિવેલ	— 11 —	— 11 —
51	અવોળ શાહજી પિત્રાલ	— 11 —	અવોળ શાહજી
52	શુભકાંત વોશ્વ વારદા	બિના	શુભકાંત
53	માડર દોડરવાડ	દિગંધા	માડર
54	ભાઈ દોડ દિગંધા (સામગ્રી)	દિગંધા	માડર
55	ગ. ન. ગોડગાંધી	14. 8 —	ગોડગાંધી
56	ગોપાલ શાહજી મુ ગોડગાંધી	બિના	ગોડગાંધી
57	પરિવર્ત શાહજી સિલ્વાડ	બિના	ગોડગાંધી
58	શાહજી	ગોડગાંધી	ગોડગાંધી
59	પંકજ સારંગી ગોડગાંધી	ગોડગાંધી	ગોડગાંધી
60	દેવિલાલ શાહજી શાહજી	— 11 —	દેવિલાલ શાહજી
61	R. G. Laxman	Grandson of	ગોડગાંધી
62	D. S. Jaganmole	1000 / 1000000	ગોડગાંધી
63	શાહજી શાહજી પારીકા કપસરવંચ	શાહજી	શાહજી
64	શ્રીવાલ શાહજી ગોડગાંધી	ગોડગાંધી	ગોડગાંધી
65	શ્રીવાલ શાહજી ગોડગાંધી	ગોડગાંધી	ગોડગાંધી
66	શ્રીવાલ શાહજી ગોડગાંધી	ગોડગાંધી	ગોડગાંધી

***Compliances of Minutes of Public
Hearing held on 26.04.2005 for
Gondegaon OC Project***

**Compliance Status as on 18.08.2018 of Minutes of Public
Hearing held on 26.04.2005
Time 11:30 AM
Venue: Bachat Sabhagriha Collectorate, Nagpur**

Acid mine discharge is due to presence of Pyrite bands along the coal seams and it is not present in all the coal mines. In the above said study area's geological formation does not have pyrite bands none of the coal mines are acidic in nature.

- **Industrial Effluent & Mine water**

ETPs of sufficient capacity with oil skimmer/ (O&G Trap) has been installed near the washing ramp of the workshops where the discharged water is being properly treated for having a zero discharged system. The ETP sludge is being treated properly at CHWTDFS, Butibori before final disposal.

S.No	Name of Mine	Existing ETP
1	Gondegaon OC	1 No. ETP of 100 KLD capacity

- **Surface runoff of sediments/soil from OB/Mines.**

Adequate numbers of vegetation are grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it also reduces surface run-off, which helps averting siltation of Natural watercourses.

In the said opencast projects, to arrest the silt, Catch drains with sufficient length & breadth dimensions have been constructed around the OB dumps. The same is regularly de-silted and maintained properly. Garland drains are also provided around the quarries.

Catch drains are provided around the OB dumps to collect the run off & silt during peak rainfall. In OB benches, cross drains are provided which collect all silt & run off to the mine sump having sufficient capacity to deal with peak rainfall. These mine pumps provide sufficient settling time for suspended particles. As expansion project shall commence, the Garland drain/catch drain shall be extended suitably.

Embankments of minimum 6 meters height above HFL on the river side are constructed and strengthened by plantation and stone pitching (wherever necessary) on the sides.

- **Regular monitoring**

Monitoring of Environmental Attributes is being carried out at effluent points of sedimentation tanks & workshop ETPs for monitoring of water quality and for further strengthening/ augmentation of additional measures if needed.

Soil Pollution Control Measures

Top soil is stacked separately at an earmarked area, similarly OB dumps are being stacked at an earmarked areas only as per the stage wise reclamation plan & plantation programme, mine closure plan, By the end of mine life, technical reclamation & biological reclamation will be carried out.

Recently Plantation of 30,000 nos. is done on OB Dump and slope by MPRVVN Ltd. to maintain stability of the OB dump and top soil. Regarding monitoring of reclaimed areas it may be mentioned here that, plantation is done by expert agencies which includes, plantation along with 3/5 years maintenance. Status of reclamation will submitted to RO, MoEF & CC along with EC compliance report

(Photos of Control Measures enclosed as Annexure-A)

**Compliance Status as on 18.08.2018 of Minutes of Public
Hearing held on 26.04.2005
Time 11:30 AM
Venue: Bachat Sabhagriha Collectorate, Nagpur**

2	Recommendation : Due to mining water table in adjoining areas go down WCL shall take exhaustive ground water recharging works for recuperation of ground water level and supply to the affected villages during scarcity of water
	Compliance status: WCL has taken several measures and continuously taking steps ground water recharging works for recuperation of ground water level and supply to the affected villages. The details of such initiatives are placed below: Regarding rainwater harvesting it may be mentioned here that, the leftover mine voids after life of mine will act as water body & rainwater harvesting structures helping in water conservation & in improving groundwater levels. Recently, a Work order for installation of Rooftop Rainwater harvesting system at Gondegaon Transit hostel building and dispensary has been awarded vide ref no. WCL/GM/NGP/C6/1468 dated 19.03.2008 and work is in progress. (Photos of site enclosed <i>as Annexure B</i>) Additionally, pond of 382.50 m³ size provided for the collection of rain water near Yeshamba village In general, at present, the excess treated mine pumped out water discharged to local streams/ nullah is being used by the neighboring community. Out of the total quantity of mine pumped out water of 32688 cubic meter per day, within the mine for various purposes about 5000 cubic metre per day is used. The balance quantity is being supplied to the local/ neighboring community for drinking, domestic & irrigation purposes In this regard, WCL has signed an MoU with Maharashtra Govt. to provide 10.76 Million M³/ year water from the OC mines to Thermal Power Plants and Signed an MoU with VIDC (Vidharba Irrigation Development Corporation) for providing water 28.16 Million M³/year for irrigation purposes from the mines of Nagpur Area of WCL. Additionally, proposals for i) Installation of RO Plant for drinking water – 100 cubic metre per day & ii) Installation of Pressure Filter Plant for drinking water – 630 cubic metre per day are under consideration.
3	Recommendation : To maintain ecological balance in the surrounding area WCL shall carry out massive tree plantation in open areas as well as avenue plantation on public roads. Compliance status: WCL has taken several measures to maintain ecological balance in the surrounding areas by carrying out massive plantation in open areas as well as avenue plantation on public roads. Details of such measures are mentioned below: Till date 3,93,905 nos. of saplings comprising of mixture of native species are planted in the project area covering an area of 128.20 ha and as per the approved EMP, by the end of the mine life an area of 255 ha will be reclaimed biologically. Apart from regular plantation, avenue plantation along the coal transportation road of 8.6 km (approx.) was done. (For detailed yearwise plantation copy enclosed as <i>Annexure-c</i>)

**Compliance Status as on 18.08.2018 of Minutes of Public
Hearing held on 26.04.2005
Time 11:30 AM
Venue: Bachat Sabhagriha Collectorate, Nagpur**

4	Recommendation : As per the representation of the villages WCL shall take a repairing tarring of roads where trucks are passing Compliance status: WCL has taken several initiatives/measures for tarring of roads where trucks are passing. Coal is transported along black topped avenue planted coal transportation road of 8.6 km (approx.) as per the provisions & route of approved mining plan. Along with this as a CSR initiative, company is regularly working in the maintenance and construction of roads at nearby areas for easing the transportation of local people Some of the Initiatives are mentioned below:		
	2013-14	Yesamba village/ Wagholi village	Repairing of damaged Tar road from village Yesamba to Village Wagholi under Gondegaon SA.(Approx. Length 3.00 Km)
	2012-13	Warada Village	Construction of cement concrete road (400mx3m) at village Warada near Gondegaon.
	2012-13	Ghat rohna to Juni Kamptee	Making balance concrete pavement from Ghatrohna to Juni Kamptee (300 Mtrs.)
	2012-13	Rohna village	Construction of cement concrete road at Rohna Village under GSA.
	2011-12	Yesamba village	Providing concrete pavement at Main road at Yesamba village, Tah: Parseoni(200MX3.7M)
	2010-11	Warada Village	Repair of balance approach road from Yashamba to Warada Village under GSA. (Spill Over 2009-10)
	2010-11	Ghat Rohna village	Construction of cement concrete road from Juni Kamptee to Ghat Rohna Village under GSA.
	2010-11	Tekadi village	Repairing of approach road from Tekadi Village upto NH-7 under GSA.
5	Recommendation: WCL Shall examine the representation submitted by Sarpanch to carry out social development works in affected villages in consultation with District administration.		
	Compliance status: As per the CIL's CSR policy under Companies Act, 2013, The fund for the CSR will be allocated based on 2% of the average net profit of the Company for the three immediate preceding financial years or Rs 2.00 per Tonne of Coal Production of the previous year whichever is higher. In relation to this, WCL has carried out various social development works in affected villages and nearby areas in consultation with Sarpanch and District Administration. CSR fund allocated utilized towards socio economic development of villages neighbouring the project within 25 km range. (Details of CSR activities is enclosed as <i>Annexure-D</i>)		

**Compliance Status as on 18.08.2018 of Minutes of Public
Hearing held on 26.04.2005
Time 11:30 AM
Venue: Bachat Sabhagriha Collectorate, Nagpur**

6	Recommendation: It is recommended that the matter related to acquisition of land, employment if any should be done on priority basis. Compliance status: All the matters related to acquisition of land, employment are done on priority basis as per <i>Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (also Land Acquisition Act, 2013)</i> and lays down the procedure and rules for granting compensation, rehabilitation and resettlement to the affected persons. In this regards Company has provisions to provide fair compensation to those whose lands are taken away, bring transparency to the acquisition of land or buildings, infrastructural projects ensures rehabilitation to those affected. State shall pay compensation for the land as per the market price for land, building or acquired structure. WCL ensures the following points while implementing: • To ensure, in consultation with institutions of local self-government and Gram Sabhas, a participative, informed and transparent process for land acquisition, development of essential infrastructural facilities and urbanisation with the least disturbance to the owners of the land and other affected families. • Provide just and fair compensation to the affected families whose land has been acquired or proposed to be acquired or are affected by such acquisition • Make adequate provisions for such affected persons for their rehabilitation and resettlement. • Ensure that the cumulative outcome of compulsory acquisition should be that affected persons become partners in development leading to an improvement in their post-acquisition social and economic status. As on date 01/08/2018, Total Land holding of Gondagaon is 821.94 Ha out of proposed 845.74 Ha and as per <i>Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (Land Acquisition Act, 2013)</i> employment given to 422 nos. of persons and monetary compensation given to 15 persons till date, as a compensation to those families whose land has been acquired or proposed to be acquired or are affected by such acquisition. Amount paid to PAPs towards Land during 2013-14 to 2017-18 is Rs. 7,38,69,664.00 to ensure development of essential infrastructural facilities and urbanization to those affected. (Details of land acquisition and R&R activities is enclosed as <i>Annexure-E</i>).
7	Recommendation: The continuous Ambient Air quality monitoring station shall be installed in the mine premises & results shall be displayed at local panchayat & Maharashtra Pollution Control Board. Compliance status: Regarding environmental monitoring, it may be mentioned here that, ambient air quality is being monitored every fortnight at 4 locations (including core & buffer zones) by CMPDI Ltd. and most of the time, air quality conforms to the standards prescribed and the same reports are submitted to RO, MoEF & CC and SPCBs on regular basis and results are displayed on company website regularly. (Copy of Monitoring report enclosed as <i>Annexure F</i>) WCL has initiated the proposal for the work of CAAQMS at Gondagaon OC Project. In this regard, it may be mentioned that the provision of online continuously Ambient Air quality monitoring station at one location will be installed after due consultation with MPCB. The appropriate financial provision has been made in the Approved Project Report. Result will be displayed at local panchayat & Maharashtra Pollution Control Board.

*Photos of Pollution Control
Measures at
Expansion of Gondegaon
Extension OC project*

List of Pollution Control Measures with Photographs at Expansion of Gondegaon Ext. OC Coal Mine Project of Nagpur Area, WCL

Air Pollution Control

1. Three nos. of mobile water tankers with mist sprinkling system of capacity of 28 KL, and two nos. of 12 KL & 8 KL are deployed for the water spraying to achieve the effective dust suppression on coal transportation roads, haul road & near coal stock yard.







Photo: Showing water spraying on coal transportation road for dust suppression.

2. 25 nos. of the fixed sprinklers are installed over the conveyor belt, hopper, weighbridge, coal stockyard and along the coal transportation road.





3. In order to achieve the minimum dust generation, all Coal Carrying trucks are properly covered by Tarpaulin to minimize the fugitive dust emission (arise due to coal spillage) and trucks are being monitored through CCTVs cameras & GPS system for the compliance and to ensure minimum coal dust emission.



4. To minimize the dust generation during coal transportation the roads has been black topped along with a 3-tier bamboo plantation. Total length of the internal black topped road is around 2.8 Km (Black topped road 8.6 km & concrete Road is 0.80 km).



Pic: showing Black topped road (length 8.6 Km)

5. To minimize the air pollution control both of the CHP are fully covered by side cladding



Pic: CHP side cladding

6. Manual Road Sweeping is done in routine along the road side for maintaining Cleaning & brooming at the project and also a brooming machine of around 46 lakhs from Eicher has also been deployed for the routine brooming and cleaning at Coal transportation Coal.



Pic: Showing Automatic brooming machine

7. All the operating vehicles are certified by PUC to control pollution



8. To reduce electricity consumption LED lights have been installed in all offices & residential Colony.

9. To reduce air pollution in colony area, the all workers have facilitated with LPG cylinders by management. No Coal is issued to workers for domestic purpose.

10. Four number of AAQ monitoring stations have been established for regular monitoring (TPM, PM 10, PM 2.5, SO₂, NO_x) of the ambient air quality and water also. The monitoring is done by Central Mine Planning and Design Institute, Regional Institute no-IV, Nagpur-A NABL Accredited Lab on fortnight basis. And reports are regularly being submitted to MOEF&CC, New Delhi & Regional Office also.

Plantation:

A total of 3,93,905 nos. (128.2 Ha) of the saplings having species of neem, karanja, gulmohar, teek, sisoo & bamboo etc. have been planted at vacant places, OB dumps, near CHP, in between Gondegaon village and OB dump, along coal transportation road and also in the Gondegaon project residential colony.





Pics: Showing Tree Plantation

Water Pollution Control Measures:

1. First, the raw mine discharged water is collected in a Central quarry, which function like a sump, where the coal particles (if any), are being settled down and then after the water is pumped out for further treatment through sedimentation ponds before discharging to the kanhan river.



Photo: A general view of the Central quarry

2. Two nos. of the sedimentation ponds (One sedimentation pond with baffles wall having size of 58x18x1.5 mtrs.) & one Kutcha Sedimentation pond having almost double size of the previous one respectively has been constructed for primary filtration / sedimentation of the mine discharged water.



3. ETP having a capacity of 100 KLD with oil skimmer has been installed near the washing ramp of the workshop where the discharged water is being properly treated for having a zero discharged system. The ETP sludge is being treated properly at CHWTDFS, Butibori before final disposal.





ETP (100 KLD) at Gondegaon OCM

*Photos of site proposed for
Rainwater harvesting Structure*

PHOTOS OF SITE FOR RAINWATER HARVESTING STRUCTURE



EXECUTIVE TRANSIT HOSTEL AT GONDEGAON

PHOTOS OF SITE FOR RAINWATER HARVESTING STRUCTURE



EXECUTIVE TRANSIT HOSTEL AT GONDEGAON

*Year-wise details of plantation
done at Gondegaon*

DETAILS OF YEARWISE PLANTATION DONE AT GONDEGAON BY WCL

SL NO	PLANTATION SITE	AREA PLANTED (HA)	SPECIES PLANTED	NO OF PLANTS	YEAR OF PLANTATION	AGENCY
1	On Embankment , Near CHP, substation	8.80	Neem, Teak, Sisoo, Karanj,	40,000	1996-97	Pvt. Party
2	Road to Project Office	3.50	Rain Tree, Jamun,	16,000	1997-98	FDCM Nagpur
3	Colony Road	16.30	Avanla, Cssia, Imli,	73,500	1998-99	FDCM Nagpur
4	Colony Road	4.10	Shivan, Subabul,	18,500	1999-00	FDCM Nagpur
5	Colony Road near OB dump	2.00	Gulmohar, Peltaphorou m etc	5,000	2001-02	FDCM Nagpur
6	Between OB dump and Village	27.20		68,000	2002-03	FDCM Nagpur
7	Near OB dump along CHP	20.00		50,000	2003-04	MPRVVN
8	Colony	12.00		30,000	2004-05	FDCM Nagpur
9	Near Village and WCL colony	20.00		52,000	2005-06	MPRVVN
10	Coal Transportation Road	4.00		9,805	2010-11	FDCM Nagpur
11	Rehabilitation Site			1,100	2012-13	Pvt. Party
12	OB dump	10.3		30,000	2016-17	MPRVVN
TOTAL PLANTATION		128.20 Ha		3,93,905 nos.		

***CSR Activities carried out at
Gondegaon by WCL***

CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2013-14				
			INFRASTRUCTURE	
19	2013-14	Yesamba village/ Wagholi village	Repairing of damaged Tar road from village Yesamba to Village Wagholi under Gondegaon SA.(Approx. Length 3.00 Km)	41.43
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2013-14				
20	2013-14	Parseoni Tahsil	Sponsoring of promotional activity of tribal community and culture residing in and around Parseoni Tahsil under CSR activity.	2.00
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2014-15				
21	2014-15	Warada village	Providing financial assistance to farmer of Warada village under GSA.	8.08
22	2014-15	Gondegaon & Tekadi village	Assistance to farmers of Gondegaon village and Tekadi village under CSR.	8.19
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2015-16				
23	2015-16		Jalyukta Shivar Abhiyan under CSR.	24.00
24	2015-16		Installation and commissioning of 1 no. of pressure sand water filter including making of 2 nos. ground water sump at Kanhan- Pipri	47.02
25	2015-16		Construction of body over chassis of hearse van	
26	2015-16		Skill development training to PAPs	24.00
27	2015-16		Welfare Plan tribal	2.00
28	2015-16		Community Development expn.	0.52
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2016-17				
29	2016-17		Misc. work for the safety & security of water treatment plant at Kanhan	7.44
CORPORATE SOCIAL RESPONSIBILITIES ACTIVITIES TAKEN UP IN 2017-18				
30	2016-17		Organised inter village sports like Kabaddi football etc in different villages of Area	0.35
31	2016-17		Providing Canon printer to adarsh High School, Kanhan	0.11
32	2016-17		Organised inter village sports like Kabaddi football etc in different villages of Area	0.25
33	2016-17		Supply of books for library at Dharmnagar under Nagar Parishad Kanhan-Pipri	1.06
34	2016-17		Supply of LCD Projector to Adarsh High School, Suresh Nagar Kanhan	0.24
35	2016-17		Providing sound system to Adarsh high school, Kanhan	0.17
36	2016-17		Provision for Swaccha Bharat Pankhwada	1.56

***Employment given to PAP against
Land in 2017-18***

R&R DETAILS OF MINE

Gondegaon Extension OC Coal Mine Expn.Project.

	R & R Proposed	Status as on 01.08.2018
Total Land Holding	845.74 Ha.	821.94 Ha.
Employment	---	Employment given 422 Land Losers (Balance Employment ----)
Monetary Compensation (MC)	---	MC given to 15 Land Losers (Balance Employment ---)

R & R DETAILS OF HOUSE OUSTEES

	Status as on 01.08.2018
Total House Oustees	701


Dy. Manager (Survey)
Gondegaon OC Mine


Nodal Officer (Env't.)
Gondegaon OC Mine


G.M. (Min.)/SAM
Gondegaon Sub Area

Rehabilitation activates done by WCL at Gondegaon

Sl.No	Activity	Amount (in Lakhs)
1	Construction of Bus Stop / waiting shed	1.54
2	Construction of Market Place.	4.99
3	Construction Of Play ground	6.38
4	Construction Of 01 No. Balwadi	2.07
5	Construction Of Primary & Upper Primary school.	45.14
6	Construction Of Panchayat Bhavan.	10.82
7	Construction of Open wall 4.5 m dia & 20 mtr depth.	7.57
8	Design construction & Commission of R.C.C.O.M. Tank.	32.90
9	Tube well with submersible pump.	10.66
10	Hand pump 03 Nos.	1.10
11	Providing & laying G.I. Main & distribution pipe line.	28.98
12	Construction Of community Hall.	7.81
13	Pond.	4.40
14	Construction of road, RCC culvert/RCC drain crossings and RCC drains.	449.75
15	Marking plots with cement concrete pillar & misc. civil work.	2.91
16	Repairing of damaged water supply pipe line additional road, culverts and drain.	17.70
17	Construction of Catal shed (100 No) at Rehabilitation of GSA.	7.97
18	Construction of chain link fencing and grave yard Rehabilitation site of GSA	4.91
19	Construction of Anganwadi and extension of existing old bldg at Rehabilitation under GSA.	10.54
20	Filling of earth at fowling plot area of Rehabilitation site under GSA.	38.64
21	Construction of Primary Health Centre at Rehabilitation site under GSA.	13.80
22	Repairing distempering, snowcem to school building, Gram Panchayat Community Centre at Rehabilitation site under Gondegaon Sub Area.	7.21
23	Making 02(Two) nos. 200 mm dia. Tube well with 5 Hp Submersible Pump at Gondegaon Rehabilitation site under Gondegaon Sub Area Nagpur Area	11.26
24	Construction of Black topping of road Gondegaon Rehabilitation site under GSA.	156.24
25	Construction of cremation shed and shok sabha hall at rehab. site under GSA.	16.05
26	Construction of post office building at Rehabilitation site under GSA.	6.00
27	Electrification of Internal road.	15.00
28	Construction of Bank building at Rehab site.	8.00
29	Estimate for development of garden at Rehab site.	5.00
	Total (Rs. In Lakhs)	939.95 Lakhs

Rehabilitation activates done by WCL at Gondegaon

***AIR AND WATER QUALITY
MONITORING REPORT
FOR THE JUNE'2018***

**STRICTLY RESTRICTED
FOR COMPANY USE ONLY**

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

**ENVIRONMENTAL MONITORING REPORT
GONDEGAON EXTN. OC**

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2018

Environment Laboratory
NABL Accredited vide Cert. No. T-2969

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 47⁰C in summer. In winter temperature is ranging about 22⁰C. 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.	Near Substation	- NGOA-1
2.	Near GhatRohna	- NGOA-2
3.	Gondegaon village	- NGOA-3
4.	Guest house/Filter Plant	- 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	- 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 : Day time and Night time Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102

Test Report NO : RIN/TR/JUNE-18/A-3 Date of Issue : 30/07/2018
 Name of the Customer: Env.CMPDI,Nagpur Sampling method : IS-5182
 Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19 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 : 2018
 NAME OF THE AREA : NAGPUR MONTH : JUNE.
 NAME OF THE PROJECT : GONDEGAON OC

Colony/ Guest house					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	NOx	SOX	PM-2.5
05/06/2018	152	84	5	19	45
22/06/2018	187	92	8	20	53
Permissible Limits	200	100	80	80	60
Ghatrohna village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	NOx	SOX	PM-2.5
05/06/2018	130	80	5	22	25
22/06/2018	173	89	7	15	-
Permissible Limits	200	100	80	80	60
Gondegaon village school					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	Nox	SOX	PM-2.5
06/06/2018	85	18	5	21	55
21/06/2018	70	37	6	10	-
Permissible Limits	200	100	80	80	60

Near Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	NOx	SOX	PM-2.5
05/06/2018	415	280	15	19	60
22/06/2018	292	137	12	18	59
TLV as per Env.(Protection) Amendment Rule 2000	600	300	120	120	60

- Above Std. value.

(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

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102

Test Report NO : RIN/TR/JUNE-18/W-3 Date of Issue : 30/07/2018
Name of the Customer: Env.CMPDI,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 MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2018
NAME OF THE AREA : NAGPUR MONTH JUNE..
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
05/06/2018	7.12	24	18	<2
21/06/2018	6.94	28	18	<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
05/06/2018	7.43	28	16	<2
21/06/2018	7.72	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

Test Report No. : RIN/TR/JUNE-18/W-3a Date of Issue: 30.07.2018
Name of the Customer : Env.,CMPDI,Nagpur Sampling method: By the party
Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19
Sample Description : Water sample No. of pages: 2
Test Required : IS 10500:2012

NAME OF THE COMPANY : WCL YEAR : 2018
NAME OF THE AREA : NAGPUR MONTH : JUNE
NAME OF THE PROJECT : GONDEGAON OC Sampling Date : 14/06/2018
NAME OF LOCATION : Mine water Discharge- (Main) -A

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	0.2	8.14	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	236	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	0.142	0.3	No relaxation
7	Chlorides (as Cl)- mg/l	IS-3025/32:1988, Argentometric	2.0	34	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	0.68	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	330	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	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	0.23	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	27	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/JUNE-18/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	0.006	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	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	0.03	<0.03	0.1	0.2
27	TSS- mg/l	IS 3025 (Part 17) : 1984, Gravimetric	25	46	****	
28	B.O.D.-mg/l (3 days at 27°C)	IS 3025 (Part 44) : 1993, (3 days incubation at 27°C)	2.0	4.2	****	

**** - Parameters not under IS : 10500

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	

Test Report No. : RIN/TR/JUNE-18/W-3b Date of Issue: 30.07.2018
 Name of the Customer : Env.,CMPDI,Nagpur Sampling method: By the party
 Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19
 Sample Description : Water sample No. of pages: 2
 Test Required : IS 10500:2012

NAME OF THE COMPANY : WCL YEAR : 2018
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : GONDEGAON OC Sampling Date : 14/06/2018
 NAME OF LOCATION : Mine water Discharge- (Near) B

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	4	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	4	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	7.32	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	0.215	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	0.07	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.63	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	335	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	44	75	200
12	Magnesium (as Mg) - mg/l*	IS-3025/40:1991 EDTA	3	21	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	39	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	13	45	No relaxation

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	180	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	0.03	<0.03	0.1	0.2
27	TSS- mg/l	IS 3025 (Part 17) : 1984, Gravimetric	25	60	****	
28	B.O.D.-mg/l (3 days at 27°C)	IS 3025 (Part 44) : 1993, (3 days incubation at 27°C)	2.0	6.0	****	

**** - Parameters not under IS : 10500

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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3) * - Test parameter not under NABL scope.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	

Test Report No. : RIN/TR/JUNE-18/W-3c Date of Issue: 30.07.2018
 Name of the Customer : Env.,CMPDI,Nagpur Sampling method: By the party
 Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19
 Sample Description : Water sample No. of pages: 2
 Test Required : IS 10500:2012

NAME OF THE COMPANY : WCL YEAR : 2018
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : GONDEGAON OC Sampling Date : 14/06/2018
 NAME OF LOCATION : River water u/s w.r.t Mine Discharge

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	4	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	4	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	7.10	6.5 to 8.5	No relaxation
5	Total Hardness as CaCO ₃ -mg/l	IS-3025/21:1983 EDTA	4.0	148	200	600
6	Iron (as Fe) -mg/l	IS-3025/53:2003 AAS-Flame	0.06	0.242	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	0.08	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	320	500	2000
11	Calcium (as Ca) -mg/l	IS-3025/40:1991 EDTA	1.6	36	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	0.04	0.1	0.3
15	Sulphate (as SO ₄) -mg/l	APHA, 22 nd Edition Turbidity	2.0	69	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	10	45	No relaxation

Test Report No. RIN/TR/JUNE-18/W-3c

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	144	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	0.03	<0.03	0.1	0.2
27	TSS- mg/l	IS 3025 (Part 17) : 1984, Gravimetric	25	92	****	
28	B.O.D.-mg/l (3 days at 27°C)	IS 3025 (Part 44) : 1993, (3 days incubation at 27°C)	2.0	8.4	****	

**** - Parameters not under IS : 10500

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	

Test Report No. : RIN/TR/JUNE-18/W-3d Date of Issue: 30.07.2018
 Name of the Customer : Env.,CMPDI,Nagpur Sampling method: By the party
 Customer letter Ref. No. : क्षे.स.4/प.अ./पा.का./18-19
 Sample Description : Water sample No. of pages: 2
 Test Required : IS 10500:2012

NAME OF THE COMPANY : WCL YEAR : 2018
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : GONDEGAON OC Sampling Date :14/06/2018
 NAME OF LOCATION : River water u/s w.r.t Mine Discharge

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	4	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	4	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	7.21	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	0.279	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	0.07	0.2	1
9	Fluoride (as F)- mg/l	APHA, 22 nd Edition SPADNS	0.02	0.95	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	290	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	7	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	78	200	400
16	Nitrates (as NO ₃) - mg/l	IS-3025/34:1988Nessler's	0.5	12	45	No relaxation

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	0.008	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	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	0.03	<0.03	0.1	0.2
27	TSS- mg/l	IS 3025 (Part 17) : 1984, Gravimetric	25	96	****	
28	B.O.D.-mg/l (3 days at 27°C)	IS 3025 (Part 44) : 1993, (3 days incubation at 27°C)	2.0	10.2	****	

**** - Parameters not under IS : 10500

(Scientific Assistant)

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(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2018
NAME OF THE AREA : NAGPUR MONTH : JUNE.
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	Night Time
JUNE.2018	04/06/2018	64.3	65.7
JUNE.2018	22/06/2018	65.1	63.9
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : COLONY- NGON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2018	04/06/2018	42.6	41.7
JUNE.2018	22/06/2018	44.2	41.8
Permissible Limit		55	45

Name of the Location : Ghatrohna Village- NGON-3

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2018	04/06/2018	43.7	42.6
JUNE.2018	22/06/2018	42.8	41.2
Permissible Limit		55	45

Name of the Location : Juni Kamptee Village - NGON-4

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2018	04/06/2018	44.6	43.4
JUNE.2018	22/06/2018	44.8	42.9
Permissible Limit		55	45



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Mobile : 9766616867, **E-mail** : earthcare2000@gmail.com, **Website** : www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/0858	Report Date : 18-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) -440 01	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENV/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010 Sample Inward No. : ELPL/Dec.-17/269/16/AA-58	Sampling Location : 3.3 KV Substation Gondagaon Project
Sampling Date : From 11-12-17 to 12-12-17 Sample Receipt Date : 12-12-17	Sampled by : Mr. Anil Shrikhande, ELPL Representative
Avg. Ambient Temp : 21 °C Avg. Relative Humidity : 56 %	Prominent Wind Direction : NE Average Wind Speed : 1 Km/Hr
Period of Analysis : From 13-12-17 to 18-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	8.54	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	15.9	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	64.6	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	32.1	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-I:2012
5.	Ozone (O ₃)	µg/m ³	180	<20.0	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.14	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.78	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20.0	Indophenol Method, NAAQS Guideline, CPCB Vol.-I:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.2	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

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TMDy.TM



For Earthcare Labs Pvt. Ltd.

(K.L. Jadhav)
Quality Manager



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Mobile : 9766616867, E-mail : earthcare2000@gmail.com, Website : www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/0859	Report Date : 18-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.)- 440001	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENVT/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010	Sampling Location : Ghatrohna Village near Sonwane house
Sample Inward No. :ELPL/Dec.-17/269/16/AA-59	
Sampling Date : From 11-12-17 to 12-12-17 Sample Receipt Date : 12-12-17	Sampled by : Mr. Anil Shrikhande, ELPL Representative
Avg. Ambient Temp : 21 °C Avg. Relative Humidity : 56 %	Prominent Wind Direction : NE Average Wind Speed : 2 Km/Hr
Period of Analysis : From 13-12-17 to 18-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	8.85	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	18.6	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	71.0	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	34.8	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20.0	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.18	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.85	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20.0	Indophenol Method, NAAQS Guideline, CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.20	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)- particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

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For Earthcare Labs Pvt. Ltd.

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(K.L. Jadhav)
Quality Manager



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Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/0860	Report Date : 18-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) -4400 01	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENVT/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010 Sample Inward No. : ELPL/Dec.-17/269/16/AA-60	Sampling Location : Transit Hostel Gondagaon Sub area
Sampling Date : From 11-12-17 to 12-12-17 Sample Receipt Date : 12-12-17	Sampled by : Mr. Anil Shrikhande ELPL Representative
Avg. Ambient Temp : 21 °C Avg. Relative Humidity : 56 %	Prominent Wind Direction : NE Average Wind Speed : 2 Km/Hr
Period of Analysis : From 13-12-17 to 18-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	8.14	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	15.8	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	74.9	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	36.5	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-I:2012
5.	Ozone (O ₃)	µg/m ³	180	<20.0	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.22	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	1.10	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20.0	Indophenol Method, NAAQS Guideline, CPCB Vol.-I:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.20	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)- particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

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For Earthcare Labs Pvt. Ltd.

(K.L. Jadhav)
Quality Manager



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Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/0861	Report Date : 18-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) 440001	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENV/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample	Sampling Location : Grampanchayat Gondagaon
Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010	
Sample Inward No. : ELPL/Aug.-17/25806/AA-08	
Sampling Date : From 11-12-17 to 12-12-17	Sampled by : Mr. Anil Shrikhande ELPL Representative
Avg. Ambient Temp : 21 °C	Prominent Wind Direction : NE
Avg. Relative Humidity : 56 %	Average Wind Speed : 2 Km/Hr
Period of Analysis : From 13-12-17 to 18-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	10.0	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	20.2	Modified Jacob & Hochheiser Method , IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	76.0	Gravimetric Method , IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	36.7	Gravimetric Method, NAAQS Guidelines , CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20.0	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.11	AES Method , IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.75	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20.0	Indophenol Method, NAAQS Guideline , CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.20	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full , without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

Verified By

[Signature]
TM/Dy.TM



For Earthcare Labs Pvt. Ltd.

[Signature]
(K.L. Jadhav)
Quality Manager



EARTHCARE LABS PRIVATE LIMITED

Environmental Laboratory & EIA Consultant Organization

(MOEF Recognized, NABET QCI Accredited, ISO 9001, ISO 14001 & OHSAS 18001 Certified)

Head Office : C-11, Amar Enclave Commercial Wing, Jog Layout, Prashant Nagar,
Near Ajni Square, Nagpur – 440 015 **Tel & Fax :** (0712) 2251470, **Mobile :** 9766616862

Branch Office : Shop No. 27, Shah Alpine, Plot No. 6, Sector-6, Kharghar, Navi Mumbai – 410 210
Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/08167	Report Date : 29-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) -440 01	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENV/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010 Sample Inward No. : ELPL/Dec.-17/269/41/AA-167	Sampling Location : 3.3 KV Substation Gondagaon Project
Sampling Date : From 25-12-17 to 26-12-17 Sample Receipt Date : 26-12-17	Sampled by : Mr. Anil Shrikhande, ELPL Representative
Avg. Ambient Temp : 29 °C Avg. Relative Humidity : 43 %	Prominent Wind Direction : North Average Wind Speed : 5Km/Hr
Period of Analysis : From 27-12-17 to 29-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	7.3	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	14.5	Modified Jacob & Hochheiser Method , IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	69.2	Gravimetric Method , IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	34.1	Gravimetric Method, NAAQS Guidelines , CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.15	AES Method , IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.82	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20	Indophenol Method, NAAQS Guideline , CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	3.64	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full , without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

Verified By

[Signature]

TM/Dy.TM



For Earthcare Labs Pvt. Ltd.

[Signature]
(K.L. Jadhav)
Quality Manager



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Near Ajni Square, Nagpur - 440 015 **Tel & Fax :** (0712) 2251470, **Mobile :** 9766616862

Branch Office : Shop No. 27, Shah Alpine, Plot No. 6, Sector-6, Kharghar, Navi Mumbai - 410 210
Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/08168	Report Date : 29-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.)- 440001	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project, Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENVT/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010	Sampling Location : Ghatrohna Village near Sonwane house
Sample Inward No. : ELPL/Dec.-17/269/41/AA-168	
Sampling Date : From 25-12-17 to 26-12-17 Sample Receipt Date : 26-12-17	Sampled by : Mr. Anil Shrikhande, ELPL Representative
Avg. Ambient Temp : 29 °C Avg. Relative Humidity : 43 %	Prominent Wind Direction : North Average Wind Speed : 5 Km/Hr
Period of Analysis : From 27-12-17 to 29-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	7.8	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	16.2	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	74.4	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	36.3	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.19	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.89	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20	Indophenol Method, NAAQS Guideline, CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	3.5	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

Verified By

[Signature]

TM/Dy.TM



For Earthcare Labs Pvt. Ltd.

[Signature]
(K.L. Jadhav)
Quality Manager



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Branch Office : Shop No. 27, Shah Alpine, Plot No. 6, Sector-6, Kharghar, Navi Mumbai – 410 210
Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/08169	Report Date : 29-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) -4400 01	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENV/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010 Sample Inward No. : ELPL/Dec.-17/269/41/AA-169	Sampling Location : Transit Hostel Gondagaon Sub area
Sampling Date : From 25-12-17 to 26-12-17 Sample Receipt Date : 29-12-17	Sampled by : Mr. Anil Shrikhande ELPL Representative
Avg. Ambient Temp : 29 °C Avg. Relative Humidity : 43 %	Prominent Wind Direction : North Average Wind Speed : 5 Km/Hr
Period of Analysis : From 27-12-17 to 29-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	9.6	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	18.8	Modified Jacob & Hochheiser Method, IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	76.5	Gravimetric Method, IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	38.2	Gravimetric Method, NAAQS Guidelines, CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.27	AES Method, IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	1.20	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20	Indophenol Method, NAAQS Guideline, CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	3.74	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)-particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full, without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

Verified By

[Signature]

TM/Dy.TM



For Earthcare Labs Pvt. Ltd.

[Signature]
(K.L. Jadhav)
Quality Manager



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Mobile : 9766616867, **E-mail :** earthcare2000@gmail.com, **Website :** www.earthcarenagpur.com

Test Report Ambient Air Quality

Report No. : ELPL/Dec-17/08170	Report Date : 29-12-2017
Name & Address of the Customer : M/s. Western Coalfields Limited, Nagpur, (A subsidiary of Coal India Govt. of India), Nagpur Area, Jaripatka, P.O. Jaripatka, Nagpur (M.S.) 440001	
Name & Address of Mine : M/s. Gondagaon Extension Open Cast Coal Mine Expansion Project , Gondagaon Sub-Area, WCL, PO. Gondagaon, Nagpur, Maharashtra.	
Ref. : Your Purchase Order No. WCL/AGM-NGP/ENV/2017/242 dtd. 06-12-2017	
Sample Description : Ambient Air Sample	Sampling Location : Grampanchayat Gondagaon
Sampling Ref Method : IS 5182 (Part 14) : 2000 RA 2010	
Sample Inward No. : ELPL/Dec.-17/269/41/AA-170	
Sampling Date : From 25-12-17 to 26-12-17	Sampled by : Mr. Anil Shrikhande
Sample Receipt Date : 29-12-17	ELPL Representative
Avg. Ambient Temp : 29 °C	Prominent Wind Direction : North
Avg. Relative Humidity : 43 %	Average Wind Speed : 5 Km/Hr
Period of Analysis : From 27-12-17 to 29-12-17	

Results of Analysis

Sr. No.	Test Parameters	Unit	Norms	Result	Test Method
1.	Sulphur Dioxide (SO ₂)	µg/m ³	80	7.4	Improved West and Gaeke Method, IS 5182 (Part 2) : 2001, RA 2012
2.	Nitrogen Dioxide (NO ₂)	µg/m ³	80	16.3	Modified Jacob & Hochheiser Method , IS 5182 (Part 6) : 2006 RA 2012
3.	Particulate Matter size less than 10 µm (PM ₁₀)	µg/m ³	100	69.3	Gravimetric Method , IS 5182 (Part 23) : 2006 RA 2012
4.	Particulate Matter size less than 2.5 µm (PM _{2.5})	µg/m ³	60	34.5	Gravimetric Method, NAAQS Guidelines , CPCB Vol.-1:2012
5.	Ozone (O ₃)	µg/m ³	180	<20	UV Photometric Method, IS 5182 (Part 9) : 1974 RA 2009
6.	Lead (Pb)	µg/m ³	1.0	0.12	AES Method , IS 5182 (Part 22) : 2004
7.	Carbon Monoxide (CO)	mg/m ³	4.0	0.60	GC Method, IS 5182 (Part 10) : 1999 RA 2003
8.	Ammonia (NH ₃)	µg/m ³	400	<20	Indophenol Method, NAAQS Guideline , CPCB Vol.-1:2012
9.	Benzene (C ₆ H ₆)	µg/m ³	5.0	<3.2	GC Method, IS 5182 (Part 11) : 2006 RA 2012
10.	Benzo [a] Pyrene (as BaP)- particulate phase only	ng/m ³	1.0	<1.0	GC Method, IS 5182 (Part 12) : 2004 RA 2009
11.	Arsenic (As)	ng/m ³	6.0	<2.5	AES Method, IS 5182 (Part 22) : 2004
12.	Nickel (Ni)	ng/m ³	20.0	<3.25	AES Method, IS 5182 (Part 22) : 2004

Norms : NAAQS (Govt. of India MoEF Notification No. GSR 826 CE Dtd.16-11-2009 as amended.

Note : Test results relates to tested parameters & it shall not be reproduced except in full , without prior approval of ELPL.

Remarks: Ambient air quality is meeting the norms for above parameters

Verified By

[Signature]

TM/Dy.TM



For Earthcare Labs Pvt. Ltd.

[Signature]
(K.L. Jadhav)
Quality Manager

Western Coalfields Limited

(Kasturba Nagar, Jaripatka, Nagpur - 440 014.)

(A Subsidiary of Coal India Limited)

Office of the Sub Area Manager

Gondegaon Sub Area, Nagpur Area

उप क्षेत्रीय प्रबंधक का कार्यलय

गोंडेगाव सब एरिया, नागपुर एरिया

Ref no.WCL/GM(M)/SAM/GSA/2018/138

Date 19.09.2018

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CERTIFICATE/UNDERTAKING

This is being certified that no comments has been received from stakeholders on email-id mentioned under Public notice in Business Standard/Hitavada/Navbharat dated 07/08/2018 to fulfill MOEF&CC 34th EAC deliberations held on 24/07/2018 and approved MOM issued on 31/07/2018 regarding coal mining operations of Expansion of Gondegaon Extension Open Cast Coal Mine Project of Nagpur Area of WCL for capacity of 3.50 MTPA over an area of 917 Ha.

GM (M)/Sub Area Manager,
Gondegaon Sub Area,
Nagpur Area, WCL

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one-time settlement (OTS) of ₹107 million accounts over the last three years as a part of a drive to clean up balance sheet. Banks seemed to have stepped up efforts the most in 2017-18 to get about ₹90 billion from close to one million accounts.

This assumes significance in the light of Sashakt panel's advice for banks to resort to recoveries through schemes akin to OTS to settle dues of Non-Performing Assets (NPAs) up to ₹500 million.

The information presented in the Lok Sabha covers 19 nationalised banks. It does not cover State Bank of India group and IDBI Bank.

In 2015-16, state-owned banks were able to arrive at a settlement in case of 0.69 million accounts and recovered ₹64.6 billion. In the follow-



Source: Lok Sabha Questions and Answers
OTS: One-time settlement

ing year, 2016-17, they got ₹67.8 billion from 740,000 accounts.

In 2017-18, Punjab National Bank (PNB) recovered ₹13.75 billion from 240,000 accounts, followed by ₹10.87 billion by Central Bank of India from 130,000 accounts and Union Bank of India raised ₹8.28 billion 80,000 accounts. According to RBI Instruc-

schemes are in pursuance of board-approved policies of banks, and are typically oriented towards sectors such as agriculture, Micro Small and Medium Enterprises (MSMEs), weaker sections and education loans, and typically have an upper limit on the amount of NPAs.

Sunil Mehta panel, which penned the five-pronged approach termed "Sashakt" to resolve the pool of non-performing assets, has suggested a scheme akin to OTS for SMEs.

This approach will be applicable to assets that are less than ₹500 million and contribute ₹1.2 trillion to the PSBs' stressed asset pool.

These are predominantly sole banking assets and do not need coordination between multiple banks

completely under the control of a single bank, the resolution approached should be aligned to the individual bank, albeit under broad framework.

There should be customised resolution approaches for different types of assets and a well-defined time-bound process to resolve them.

For this purpose, banks should set up focused verticals with clear targets and staff this vertical appropriately. Banks should device a template resolution approach for different types of stressed loans based on simple metrics and Standard Operating Process (SOP) for resolution. Banks should be setup up internal SME steering panel(s) for formulating and validating these schemes, including provision of additional funds.

Dena Bank's net loss widened to ₹7.21 billion for the first quarter (April-June, or Q1) of this fiscal year (2018-2019 or FY19) on a sharp rise in provisions for bad loans. The public sector bank had registered a net loss of ₹1.32 billion in Q1FY18. Under the Prompt Corrective Action (PCA) plan, the bank's total income fell 8 per cent year-on-year to ₹24.1 billion.

Dena Bank is under PCA because of high bad loans. This has put it under restrictions on growing its loan book; it has to focus on recoveries, control expenses, and conserve capital. The bank's gross non-perfo-

ago period, it was ₹2.18 per cent. In value terms, NPAs rose to ₹158.66 billion, up from ₹129.94 billion a year ago. However, sequentially, they were down from ₹163.61 billion in March 2018. The net NPAs fell to 11.04 per cent (₹57.04 billion) year-on-year, against 11.22 per cent (₹77.97 billion).

The provisioning coverage for bad assets in the June quarter also increased to ₹12.44 billion, from ₹4.34 billion set aside in same period of 2017-18.

The overall provisions and contingencies were at ₹11.15 billion for April-June, 2018-19, as against ₹5.22 billion in the same period of 2017-18.

in the quarter ended June, against net loss of ₹749 million in the year-ago quarter.

The bank's net interest income, or the interest earned minus interest expended, rose 61 per cent on a year-on-year basis to ₹2.33 billion, and the bank in a filing. Net interest margin, the difference between the yield on advances and cost of funds, stood at 11.6 per cent in June 2017, against 9.2 per cent in June 2017. Gross Loan Book grew by 20.5 per cent to ₹77.87 billion while disbursements grew by 22.9 per cent against year-ago quarter.

NIKHAT HETAVKAR

► FROM PAGE 1

them, to support them, so that we can get more highly quali-

Nooyi has also worked to appeal to modern snacks.

that target much earlier. Apart from Flipkart, the

that the proposed measure to evolve mechanisms to block

to be held by the OMCs. RIL and the OMCs are currently locked in a dispute over

firms to be registered in India. "Once you are registered, you are answerable to Sebi," he

"Bansidhar Sunderlal (Bansi) Mehta and Deepak Shantilal Parekh each serve on

Western Coalfields Limited
(A Subsidiary of Coal India Ltd.)

PUBLIC NOTICE

Expansion of Gondgaon Extension OC Coal Mine project (an operating mine) is located in Village Gondgaon, Tahasil - Parsani, Dist: Nagpur, Maharashtra for a production capacity of 3.50 MTPA over an area of 917 ha under administrative control of Nagpur Area of M/S. Western Coal Fields Limited having an Environmental Clearance accorded by MoEF & CC vide letter J-11015/106/2009-IA.II(M) dated 14/03/2018.

This public notice is being issued inviting comments from stakeholders on coal mining operations for a capacity of 3.50 MTPA over an areas of 917 ha., to fulfill MoEF & CC's 34th EAC deliberations held on 24/07/2018 and approved MoM issued on 31/07/2018.

The comments may be submitted within 30 days time from the date of publication of this notice to:

"Sub-Area Manager, Gondgaon Sub Area, Nagpur Area, WCL, P.O. Gondgaon, Dist : Nagpur-Pin 441404 (M.S.)" or can be emailed to sabyasachidey@westerncoal.gov.in or wclngpenv@gmail.com

Sub-Area Manager
Gondgaon Sub Area, Nagpur Area, WCL,
Dist : Nagpur, PIN : 441404 (M.S.)

Notice is hereby given that pursuant to Regulations 29 and 47 of SEBI (Listing Obligations and Disclosure Requirements) Regulations, 2015, a meeting of the Board of Directors of the Company will be held on Monday, 13th August, 2018 at 03.00 P.M. at Nagar-III, New Delhi-110024 to consider and approve the Unaudited Financial Results of the Company for the quarter ended June 30th, 2018;

By order of the Board

TEMPO APPLIANCES INDIA LIMITED
Formerly BRITE LEASING AND FINANCE LIMITED

Sd/-
Suresh Kumar Aggarwal
Date : 03rd August, 2018 DIN: 00093051
Place : New Delhi
(Director)

Co. Website: <http://www.tempospliances.com>
CSE: http://www.cse-india.com/new_web/index.php

For ALPHAGEO (INDIA) LIMITED
Chairman and Managing Director
DINESH ALLA

The detailed Statement of Standalone Unaudited Financial Results for the quarter ended 30th June, 2018 is available on the Stock Exchange Websites - www.nseindia.com, www.bseindia.com and also at the Company's website: www.alphageoindia.com

(2) The abstract of the Standalone Unaudited Financial Results for the Quarter ended 30th June 2018 is as given below:

Particulars	For the Quarter ended 30.06.2017	For the Quarter ended 31.03.2018	For the Year ended 30.06.2017	For the Year ended 31.03.2018
Net Profit / (Loss) for the period after tax	1547.05	5448.12	1542.88	636.48
(after Exceptional and/or Extraordinary Items)				
Total Comprehensive Income for the period (after tax)	2120.50	5304.04	636.48	636.48
Equity Share Capital (Paid Up)	-	-	22695.18	-
Reserves (excluding Revaluation Reserve)	-	-	-	-
Earnings Per Share of Rs. 10/- each (for continuing and discontinued operations):	27.27	27.27	24.43	24.43
Basic:	27.27	27.27	24.43	24.43
Diluted:	27.27	27.27	24.43	24.43
Profit / (Loss) from discontinued operations	1966.29	5623.49	1446.94	4.98
Profit after tax from continuing operations	3020.62	8669.10	2211.13	1451.92
Total Revenue from Operations	13052.96	42943.69	11418.84	11418.84
Other Comprehensive Income (Net of Tax)	1967.07	5630.65	4.98	1451.92
Total Comprehensive Income	15019.03	48574.34	11423.82	12870.76

KSAR PETROPRODUCTS LIMITED
(CIN: L23209PN1990PLC054829)

REG. Address : D-7/1, MIDC, Lote Parshuram, Taluka Khed, District - Rahatgi - 415722 Tel: 02356 272339
Website : www.ksarpetroproducts.com Email Id : info@ksarpetroproducts.com

NOTICE

Notice is hereby given pursuant to Regulation 29 read with 47 of the Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements), Regulations, 2015 that a Meeting of the Board of Directors of the Company will be held on **Tuesday, 14th day of August, 2018**, to inter alia, consider and approve the unaudited financial results for the quarter ended 30th June, 2018. The notice has been uploaded on the website of the Company www.ksarpetroproducts.com.

Further, pursuant to the provisions of Securities and Exchange Board of India (Prohibition of Insider Trading) Regulations, 2015 and as per the Code of Conduct for Prevention of Insider Trading of the Company, the trading window for trading in Company's equity shares for Directors and Designated Employees as defined in the Code shall remain closed from **Monday, 6th August, 2018 to Friday 17th August, 2018** (both days inclusive).

For KSAR Petroproducts Limited
Sd/-
Mohit Kaushik
Executive Director and CEO
DIN : 06463483
Date : 6th August, 2018
Place : MUMBAI

Public Work Division, Nagbhid

- If a candidate has good command over a subject, naturally it becomes the first preference as optional subject.
- If a candidate has already mastered a subject, he/she will prefer it as an option.
- If a subject is scoring, students tend to select it as an optional subject.

सस्ते लोन से पीछे हटे बैंक

एजेंसियां

आखिरी रूप में तैयार हैं. एयर पैसेंजर चार्टर स्टेक होल्डर्स से बात कर तैयार हुआ है. इसके तहत एयरलाइंस के हर्जाने की समय सीमा तय होगी और फ्यूल सरचार्ज अलग करने की भी छूट मिलेगी. किराए के ब्रेकअप का एक फॉर्मेट बन सकता है. एयर ट्रेफिक से देरी में एयरलाइंस जिम्मेदार नहीं होगा और मौसम के चलते देरी पर एयरलाइंस जिम्मेदार नहीं होगा.

60 प्रतिशत एबैटमेंट दिए जाने का मांग उठाया है. क्रेडाई के एक वरिष्ठ पदाधिकारी ने कहा कि इस कदम से फ्लैटों पर माल एवं सेवा कर की प्रभावी दर घटेगी और उनकी मांग बढ़ाने में मदद मिलेगी. इस समय फ्लैटों पर जमीन के लिए 33 प्रश का एबैटमेंट

कि जर्मनी के लिए वर्तमान 33 प्रश की जगह 60 एबैटमेंट दिया जाए. उन्होंने कहा कि यह छूट 12 शहरों के लिए मांगी गयी है जिनमें चार महानगरों के अलावा बेंगलूरु, हैदराबाद, पुणे, जयपुर और अहमदाबाद जैसे शहर हैं.

बैंकिंग, दूरसंचार शेयरों में तेजी

देखन का मिला.

स्तर पर बंद हुआ था.

सरकार का टेक्सटाइल वॉट्सएप खड़ी कर रहा टीम सेक्टर को तोहफा

5 करोड़ लोगों को मिलेगा रोजगार



एजेंसियां दिल्ली. चुनाव से पहले सरकार टेक्सटाइल सेक्टर को बूस्टर डोज देने की तैयारी में है. सीएनबीसी-आवाज को मिली एक्सक्लूसिव जानकारी के मुताबिक सरकार ने करीब 300 टेक्सटाइल प्रोजेक्ट पर इंपोर्ट ड्यूटी बढ़ाने का सैद्धांतिक फैसला ले लिया है. इसका नोटिफिकेशन अगले हफ्ते जारी हो सकता है. इतना ही नहीं टेक्सटाइल सेक्टर में विदेशी निवेश यानी एफडीआई नियमों में ढील भी दे सकती है. सूत्रों के मुताबिक टेक्सटाइल पर इंपोर्ट ड्यूटी 5-10 फीसदी से बढ़ाकर 20 फीसदी तक हो सकती है. वित्त मंत्री

ने प्रस्ताव को मंजूरी दे दी है. जिसके तहत फैब्रिक, गारमेंट, मैन मेड फाइबर को राहत संभव है. अगले हफ्ते इस मामले पर प्रधानमंत्री के साथ बैठक है. आगामी विधानसभा चुनाव में फायदा मिलने की उम्मीद के साथ ही सरकार को रोजगार बढ़ाने में मदद मिलने की संभावना है. टेक्सटाइल सेक्टर में 2025 तक 5 करोड़ रोजगार देने का लक्ष्य है.

जुलाई में, घरेलू विनिर्माण को बढ़ावा देने के उद्देश्य से सरकार ने जैकेट, सूट और कालीन सहित 50 से अधिक आइटम पर 20 प्रतिशत इम्पोर्ट ड्यूटी को दोगुना कर दिया था. व्यापार विशेषज्ञों के मुताबिक, भारत कपड़ा क्षेत्र को कोई प्रत्यक्ष निर्यात प्रोत्साहन नहीं दे पाएगा. इसलिए घरेलू विनिर्माण को प्रोत्साहित करने के लिए सेगमेंट शुरू करना बहुत जरूरी है. बता दें कि जून में कपड़े और धागे का इम्पोर्ट 8.58 फीसदी बढ़कर 168.64 मिलियन डॉलर हो गया.

भारत में फर्जी खबरों से निपटने की पहल

एजेंसियां दिल्ली. फर्जी खबरों को लेकर आलोचना झेल रही सोशल मीडिया कंपनी वॉट्सएप ने सरकार से कहा कि वह इस समस्या से निपटने के लिये भारत में एक स्थानीय टीम खड़ी कर रही है, जिसका प्रमुख कोई भारतीय हो सकता है. आधिकारिक सूत्रों ने यह जानकारी दी. सूत्रों ने यह भी कहा कि सोशल नेटवर्किंग कंपनी ने फर्जी संदेश की शुरुआत करने वालों की पहचान बताने की सरकार की मांग पर सहमति नहीं जताई है और उसका कहना है कि ऐसा करने से निजी संदेशों के एक मंच के रूप में वॉट्सएप का निजी स्वरूप प्रभावित होगा. सूचना प्रौद्योगिकी मंत्रालय के एक अधिकारी ने कहा कि वॉट्सएप ने सरकार के पिछले नोटिस का जवाब भेजा है.

वॉट्सएप के एक प्रवक्ता ने संपर्क करने पर कहा भारत में अपने उपयोगकर्ताओं की मदद के लिये और देश में अपना निवेश जारी रखने के लिये हमारी पहली प्राथमिकता एक स्थानीय व्यक्ति की नियुक्ति करना है जो एक स्थानीय टीम बनाने में हमारी मदद कर सके. भारत में वॉट्सएप



में इस समय दो वरिष्ठ पदे खाली हैं, जिसमें भारत में कंपनी का प्रमुख और नीति प्रमुख शामिल है. उसने कहा कि वॉट्सएप का इस्तेमाल लोग सभी प्रकार के संवेदनशील वार्तालाप के लिये करते हैं, इनमें चिकित्सक, बैंक और परिवार के साथ बातचीत भी शामिल होती है. हाल में भीड़ द्वारा लोगों को पीट-पीटकर मारे जाने की कुछ घटनाओं में वॉट्सएप संदेशों की भूमिका के बारे में कंपनी का मानना है कि भीड़ के हमलों की समस्या से निपटने के लिए सरकार, समाज और तकनीकी कंपनियों को साथ मिलकर काम करना होगा.

कानूनी इकाई भी की स्थापित

कंपनी ने कहा इसीलिये हम पहले ही अपनी सेवाओं में काफी बदलाव कर चुके हैं ताकि भ्रामक सूचनाओं के प्रसार की गति को धीमा किया जा सके. हम लोगों को यह भी समझा रहे कि फर्जी खबरों की पहचान कैसे की जा सकती है. वॉट्सएप के मुख्य परिचालन अधिकारी मैट इडेमा हाल फिलहाल में भारत आये थे और सूचना प्रौद्योगिकी मंत्रालय के अधिकारियों से मिले थे. मंत्रालय के अधिकारी ने अपनी पहचान सार्वजनिक नहीं किये जाने की शर्त पर बताया कि वॉट्सएप ने अपने जवाब में यह भी कहा कि उसने भारत में अपनी एक कानूनी इकाई स्थापित कर ली है लेकिन यह मंच संदेश के स्रोत या पहचान को बताने के लिये तैयार नहीं है. यह सरकार की प्रमुख मांगों में से एक थी. उसने कहा कि इसे देखते हुये यह कहा जा सकता है कि मंत्रालय की चिंताओं को दूर नहीं किया गया है और इस मंच के दुरुपयोग के खतरे बने हुये हैं.

वेस्टर्न कोलफील्ड्स लिमिटेड

(कोल इंडिया लिमिटेड की एक अनुषंगी कंपनी)

सार्वजनिक सूचना

मेसर्स वेस्टर्न कोलफील्ड्स लिमिटेड के नागपुर क्षेत्र के प्रशासनिक नियंत्रण के अधीन गोंडेगाँव एक्सपेंशन ओसी कोल माइन प्रोजेक्ट ग्राम-गोंडेगाँव, तहसील-पारशिवनी, जिला-नागपुर, महाराष्ट्र में स्थित है। जिसका क्षेत्रफल 917 हेक्टेयर है और जिसकी उत्पादन क्षमता प्रतिवर्ष 3.50 मिलियन टन है और यह प्रचालन खदान है। इस प्रोजेक्ट को पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय द्वारा उनके पत्र सं. J-11015/106/2009-IA-II (M), दि. 14.03.2018 के माध्यम से पर्यावरणीय मंजूरी प्रदान की गई है। पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय की विशेषज्ञ मूल्यांकन समिति की दि. 24.07.2018 को आयोजित 34 वीं बैठक में किए गए विचार-विमर्श तथा दि. 31.07.2018 को जारी अनुमोदित एमओएम के संदर्भ में आवश्यकताओं को पूरा करने के लिए 917 हेक्टेयर क्षेत्रफल में प्रतिवर्ष 3.50 मिलियन टन क्षमता की उक्त परियोजना में कोयला खनन कार्यों के संबंध में स्टेक होल्डर्स से उनकी टिप्पणियां आमंत्रित करते हुए यह सार्वजनिक सूचना जारी की जा रही है। टिप्पणियां इस सार्वजनिक सूचना के प्रकाशन की तारीख से 30 (तीस) दिनों के अंदर निम्नलिखित पते / ई-मेल पर भेजी जा सकती है:

"उप क्षेत्रीय प्रबंधक, गोंडेगाँव उपक्षेत्र, नागपुर क्षेत्र, डब्ल्यूसीएल, पोस्ट ऑफिस-गोंडेगाँव, जिला: नागपुर-पिन 441404 (महाराष्ट्र)", ई-मेल : sabyasachidey@westerncoal.gov.in या टिप्पणियां निम्नलिखित पते / ई-मेल पर भी भेजी जा सकती है:

"क्षेत्रीय नोडल अधिकारी (पर्यावरण), क्षेत्रीय महाप्रबंधक का कार्यालय, नागपुर क्षेत्र, डब्ल्यूसीएल, जरीपटका, जिला-नागपुर-पिन 440014 (महाराष्ट्र)", ई-मेल : wclngpennv@gmail.com

उप क्षेत्रीय प्रबंधक, गोंडेगाँव उपक्षेत्र, नागपुर क्षेत्र, डब्ल्यूसीएल, जिला : नागपुर, पिन - 441404 (महाराष्ट्र)

वेस्टर्न कोलफील्ड्स लिमिटेड

(कोल इंडिया लिमिटेड की एक अनुषंगी कंपनी)

सार्वजनिक सूचना

मेसर्स वेस्टर्न कोलफील्ड्स लिमिटेड के उमरेड क्षेत्र के प्रशासनिक नियंत्रण के अधीन उमरेड ओसी एक्सपेंशन प्रोजेक्ट, ग्राम-केनवा, तहसील-उमरेड, जिला-नागपुर, महाराष्ट्र में स्थित है। जिसका क्षेत्रफल 944.65 हेक्टेयर है और जिसकी उत्पादन क्षमता प्रतिवर्ष 3.50 मिलियन टन है और यह प्रचालन खदान है। इस प्रोजेक्ट को पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय द्वारा उनके पत्र सं. J-11015/86/2005-IA-II (M), दि. 20.05.2005 के माध्यम से पर्यावरणीय मंजूरी प्रदान की गई है। पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय की विशेषज्ञ मूल्यांकन समिति की दि. 24.07.2018 को आयोजित 34 वीं बैठक में किए गए विचार-विमर्श तथा दि. 31.07.2018 को जारी अनुमोदित एमओएम के संदर्भ में आवश्यकताओं को पूरा करने के लिए 944.65 हेक्टेयर क्षेत्रफल में प्रतिवर्ष 3.50 मिलियन टन क्षमता की उक्त परियोजना में कोयला खनन कार्यों के संबंध में स्टेक होल्डर्स से उनकी टिप्पणियां आमंत्रित करते हुए यह सार्वजनिक सूचना जारी की जा रही है। टिप्पणियां इस सार्वजनिक सूचना के प्रकाशन की तारीख से 30 (तीस) दिनों के अंदर निम्नलिखित पते / ई-मेल पर भेजी जा सकती है:

"उप क्षेत्रीय प्रबंधक, उमरेड उपक्षेत्र, डब्ल्यूसीएल, पोस्ट ऑफिस-उमरेड, जिला: नागपुर- पिन: 441204 (महाराष्ट्र), ई-मेल : rajiv.s8661@coalindia.in या टिप्पणियां निम्नलिखित पते / ई-मेल पर भी भेजी जा सकती है:

"क्षेत्रीय नोडल अधिकारी (पर्यावरण), क्षेत्रीय महाप्रबंधक का कार्यालय, उमरेड क्षेत्र, डब्ल्यूसीएल, तहसील: उमरेड, जिला-नागपुर-पिन 441204 (महाराष्ट्र) ई-मेल : rkshelke@westerncoal.gov.in

उप क्षेत्रीय प्रबंधक, उमरेड उपक्षेत्र, उमरेड क्षेत्र, डब्ल्यूसीएल, जिला : नागपुर, पिन - 441204 (महाराष्ट्र)



भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FORESTS
& CLIMATE CHANGE

Regional Office (WCZ)
Ground Floor, East Wing
New Secretariat Building
Civil Lines, Nagpur - 440001
E-mail: apccfcentral-ngp-mef@gov.in

F.No:EC-766/2018-NGP/4810

Date: 21.01.2019

To,

Scientist 'E'
IA Division (Coal Mining)
Ministry of Environment, Forest & Climate Change
Indira Paryavaran Bhawan,
Aliganj, Jorbagh Road,
New Delhi-110003

Sub: Environmental clearance granted for Gondegaon Extension Opencast Coal Mine Project from 2.5 MTPA to 3.5 MTPA by M/s. Western Coalfields Limited in an area of 917 ha. in village Gondegaon, Tehsil Parseoni, District Nagpur

Ref:

1. Ministry of Environment, Forests & Climate Change letter no. J-11015/106/2009-IA.II(M) dated 14.03.2018

Sir,

I am directed to invite your kind attention on the above subject and letter under reference. Monitoring report of compliance to conditions stipulated in Environment Clearance accorded to Gondegaon Extension Opencast Coal Mine Project from 2.5 MTPA to 3.5 MTPA by M/s. Western Coalfields Limited in an area of 917 ha. in village Gondegaon, Tehsil Parseoni, District Nagpur is enclosed herewith. Site inspection has been carried out on 03.01.2019.

Ministry granted environmental clearance vide letter dated 14.03.2018 for the project for expansion of coal mine from 2.5 MTPA to 3.5 MTPA for a period of one year. Maximum production achieved till date is 3.16 million tonnes during 2017-18. As per the details provided, construction works at rehabilitation site of the Gondegaon village completed and 400 families already shifted to the rehabilitation site. Backfilling of mine out area is in progress. An area of 9.950 ha has been backfilled up to ground level and about 31 ha. area is under backfilling. Plantation has been carried out over an area of 128.2 ha. Embankment of 5.7 km provided for the Kanhan River. Water sprinkling system has been provided for the coal handling plant, haul roads, coal stock yards. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondegaon has been started by

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MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.

This issues with the approval of APCCF (Central), Regional Office, Nagpur.

A. Suresh Kumar
21/01/19
Suresh Kumar Adapa
Scientist 'D'

Encl: as above

Copy to:

1. Director RO HQ, Ministry of Environment, Forest & Climate Change, Government of India, 1st Floor Agni Wing, Indira Paryavaran Bhawan, Jorbagh Road, New Delhi-110 003
2. Director (Monitoring Cell), Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, Aliganj, Jorbagh Road, New Delhi-110003
3. General Manager(Environment), Western Coalfields Limited, Coal Estate, Civil Lines Nagpur-440001
4. Guard file

A. Suresh Kumar
21/01/19
Suresh Kumar Adapa
Scientist 'D'

**MONITORING THE IMPLEMENTATION OF ENVIRONMENTAL
SAFEGUARDS
MINISTRY OF ENVIRONMENT & FORESTS
REGIONAL OFFICE (W), BHOPAL MONITORING REPORT
DATA SHEET**

SUBMITTED BY PA

1	Project types River-valley/ Mining/ Industry/ Thermal/ Nuclear/ other (specify)	Opencast Coal Mining Project
2	Name of the Project	Expansion of Gondegaon Extension Opencast coal mine project
3	Clearance letter(s)/ OM no. & date	J-11015/106/2009-IA-II(M) dtd.14.03.2018
4	Location :	
	a) District(s)	NAGPUR
	b) State (s)	MAHARASHTRA
	c) Latitude	22° 16' N - 22° 16' N.
	d) Longitude	79° 11' E - 79° 12' E.
5	Address for correspondence :	
	a) Address of concerned Project Chief Engineer (with pin code & telephone/fax).	Project Officer, Gondegaon OC, Gondegaon Sub-Area, WCL, PO. Gondegaon, Nagpur, Maharashtra.
	b) Address of Executive Project Engineer/ Manager (with pin code/fax nos.)	Area General Manager, WCL, Nagpur Area, P.O. Jaripatka, Nagpur - 440 014, Maharashtra, Ph. (0712) 2643655, FAX (0712) 2643352.
6	Salient features :	
(A)	Of the project :	
1.	Production Capacity	EC Capacity: Normative 2.50 MTPA to Peak 3.50 MTPA.
2.	Lease hold Area	
3.	Balance Mineable coal reserve	22.19 Mt
4.	Total OB including access trench	
5.	Average S/R (m ³ /t)	4.43
6.	Life of the Project	7 Years as on 01.04.2018
7.	Quarry area on floor	182.78 Ha
8.	Quarry Area on Surface	277.13 Ha
9.	Average strike length on floor	3000 m
10.	Average thickness of seam	27.72 m
11.	GCV of coal (0.10m dilution at each contact period)	G-10 (Seam -V & IV) G-8 (Seam-III & II)
12.	Target production (Mty)	3.50
13.	Total OB (Mn3)	98.20
14.	Manpower requirement (nos.)	921
15.	Overall MOS (t)	14.395
(B)	Of the Environment management plan	
1.	Public Hearing	Done on 26.04.2005 for 2.5 MTPA (For 3.5 MTPA public consultation is exempted)
2.	Environment clearance	Normative 2.50 MTPA to Peak 3.50 MTPA

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		vide ref no.J-11015/106/2009-IA.II(M) Dated 14.03.2018
3.	Consent to Establish	Issued vide ref no.BO/CAC CELL/UAN NO.0000041397/R/CAC-1804000354 Dated 07.04.2018 for 1 MTPA i.e 2.5 MTPA TO 3.5 MTPA
7	Breakup of the project area	
	Submergence Area : Forest & non-forest area	No Forest area involved
1.	Non Forest Area	845.74 Ha
2.	Quarry Area	277.13 Ha
3.	Embankment Area	13.05 Ha
4.	External OB Dump Area	323.98 Ha
5.	Infrastructure	50.00 Ha
6.	Project township	13.00 Ha
7.	Area needed for rationalization and blasting zone	146.92 Ha
	Total Land	845.74 Ha

8	Break-up of the project affected population with enumeration of those losing houses/ dwelling units only/agricultural land only, both dwelling units and agricultural land, landless labourers/artisans: a) SC / ST Adivasis : (Please indicate whether these figures are based on any scientific/systematic survey carried out or only provisional; if a survey is carried out give details with year of survey)	Presently land has been purchased and compensation and/ or employment given to land losers. Some villagers have already shifted to new Gondegaon Rehab site (19.24 HA), near Kandri village and construction of their new houses is under progress. Also hospital and other amenities are under construction. In addition to compensation for land ousters, total 422 entitled persons have been given employment as per norms. (provisional figures)				
9.	Financial details :					
	a) Project Cost as originally planned and subsequent revised estimates and the year of price reference.	Capital Cost of Extension Project Rs. 325.1802 Crores (as per RPR March 2018)				
	b) Allocation made for environmental management plans with item wise and year wise break-up.	A. Pollution Control : (Amount in Rs.'000)				
		<table><tr><td>i) Sedimentation pond for treatment of mine waste water</td><td>3500</td></tr><tr><td>ii) ETP for</td><td>2000</td></tr></table>	i) Sedimentation pond for treatment of mine waste water	3500	ii) ETP for	2000
i) Sedimentation pond for treatment of mine waste water	3500					
ii) ETP for	2000					

		treatment of workshop waste water.	
		iii) Base line environmental data generation & scientific studies related to environment	1500
		iv) Dust suppression arrangement at haul road, stockyard, permanent road etc.	2500
		Plantation during first three years.	2000
		DETP for Qtrs.	5000
		v) Land reclamation measures including land use mapping through Remote Sensing.	1200
		Air Monitoring (CAAQMS)	6000
		Total	23700
c)	Benefit cost ratio/Internal rate of Return and the year of assessment.	Financial rate of return IRR = 82.45 % (100%) & 42.09 (85%) Production.	
d)	Whether (c) includes the cost of Environmental management as shown above	Yes.	
e)	Actual expenditure incurred on the project so far (Capital)	339.87 Crores expenditure incurred on project so far (Upto March'18)	
f)	Actual expenditure incurred on the environmental management so far (Capital & revenue)	Capital -- 191.73 Lakhs. Revenue--304.00 Lakhs	
10	Forest land requirement: a. the status of approval for diversion of forestland for non-forestry use. b. The status of clearing felling. c. The status of compensatory afforestation programme in the light of actual field experience.	Not applicable as non-forest land is not involved	
11	The Status of clear felling in non-forest areas (such as submergence area of reservoir, approach roads) if any quantitative information	Not Applicable.	

SUBMITTED

BY PA

12	Status of construction: a. Date of commencement (Actual and /or planned). b. Date of completion (actual and /or planned)	As per approved project report
13	Reasons for delay if project is yet to start	Not Applicable
14	Dates of site visits :	
	a) The dates on which the project was monitored by the Regional Office on previous occasions, if any.	A copy of the certificate issued vide letter F.No:3-11/2014(Env.)/3035 Dated 13.12.2017 (Copy attached-Annexure 4)
	b) Date of site visit for this monitoring report	Date of site visit 29.11.2017
15	Details of correspondence with project authorities for obtaining action plans/ inf. on status of compliance to safeguards (other than the routine support for site visits) (The first mon. report letters for logistic may contain the details of all the letters issued so far, but the later reports may cover only the letters issued subsequently)	-----

As made  Sub Area Manager,
Gondegaon OCM, Nagpur Area, WCL

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Compliance status of conditions stipulated in environmental clearance granted for Gondegaon Extension Opencast Coal Mine Project from 2.5 MTPA to 3.5 MTPA by M/s. Western Coalfields Limited in an area of 917 ha. in village Gondegaon, Tehsil Parseoni, District Nagpur granted by MoEF&CC vide letter no. J-11015/106/2009-IA.II(M) dated 14.03.2018

S.No.	Condition	Compliance Status
i.	Mitigative measures to be undertaken to control dust and other fugitive emissions all along the roads by providing sufficient number of water sprinklers. Mist type mobile sprayers/ sprinklers shall be deployed for the project.	Complying with. Sprinkling arrangement has been made for weigh bridge, CHP, haul roads, coal stock yards, coal transportation road. Following are the details of sprinklers provided at the project: • 10 nos. of fixed sprinklers are in operation near Weigh Bridge, along coal transportation road and portable sprinklers around coal stock yards. • 3 Nos. of mobile tankers of capacity 28 KL with mist arrangement, and 2 Nos. of tankers of capacity 12 KL & 8KL for dust suppression on haul roads, coal transportation roads. In addition to the above following arrangements have been made for controlling the fugitive emissions: • Coal transportation road of 8.6 km is black topped with avenue plantation • 1 no. of mechanical sweeper is in operation. • Plantation of 3, 93,905 no.s of saplings has been carried out over an area of 128.20 ha. • All the trucks carrying coal outside the project are covered by tarpaulin. • Coal handling plant (CHP) in the mine is provided with enclosures, side claddings and sprinklers. PA submitted that Installation of Comprehensive mist sprinkler system is proposed for dust suppression and control of air pollution in crushers, along conveyors belt, transfer points, bunkers of CHP and the same is expected to commissioned by March' 2019.
ii.	Regular monitoring of the occupational and other health hazards of all employees including outsourced workers and the corrective action shall be ensured. Report in this regard is submitted to Regional Office of the Ministry.	Complying with. Medical checkup of the employees is being carried out as per the following schedule: 1. Once in 5 years for the people under 45 years of age 2. Once in 3 years for the people over 45 years of age

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		PA submitted that initial (IME) and periodical medical examination (PME) is being carried out for permanent and outsourced employees. As per the information provided 56 IME and 133 PME has been carried out till date. Details of the medical examination are being submitted to Regional Office along with six monthly compliance report.
iii.	Control blasting techniques should be adopted to control ground vibration and fly rocks.	Complying with. Controlled blasting is being carried out as per the DGMS guidelines. Delay detonators are being used to arrest the fly rocks and boulders.
iv.	Persons of nearby villages shall be given training for their livelihood and skill development.	PA agreed to comply with. PA submitted that skill development training is being provided for nearby villagers, project affected persons for data entry, machine operations, nursing assistant, para medical assistant, plastic processing machine operator etc., under project UDAN and AROGYAA on regular basis.
v.	To ensure the health and welfare of nearby villages, regular medical camps shall be organized and report shall be submitted to the Regional Office of the Ministry.	PA agreed to comply with. PA submitted that medical camps for detection of diabetes, Eye checkup, blood donation, Spirometry are being conducted regularly. As per the information provided previous medical camp was held during April 2018 to August 2018 for blood donation, HBA1C, Spirometry, cancer screening, anaemia detection, etc.
vi.	Wind barrier wall / screen and vertical greenery system, green belt, dust suppression arrangement at railway siding to be installed.	Complying with. One truck mounted mist spray system has been provided at the railway siding. As per the information provided, 5000 no.s of saplings of native species have been planted at the railway siding. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondegaon has been started by MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.
vii.	Three tier multi-species green belt of not less than 7.5 m width should be developed all along the project to mitigate / check the dust pollution. Only native species to be used for plantation / greenbelt development.	Complying with. Green belt has been developed over an area of 128.2 ha. with the plantation of 3,93,905 trees of different species. Avenue plantation has been carried out along the coal transportation road. PA submitted that an area of 255 ha. will be reclaimed biologically till the end of mine life.
viii.	In the view of the mining potential of the area and the prevailing environmental concerns, carrying capacity of riverine eco-system shall be studied through some expert agencies to assess impacts	PA agreed to comply with. PA submitted that a report has been prepared and presented before EAC during its 34 th meeting held on 24 th July, 2018 with a submission that the detailed

	on the environmental components.	study of Kanhan river will require 18-24 months for completion of which include 12 months for 4 seasons data generation and remaining months for validation & interpretation and preparation of final report.
ix.	A mitigation plan based on the study to be submitted to the MoEF & CC Regional Office / SPCB and displayed on company's website.	
4.1 (a) MINING		
i.	Mining shall be carried out under strict adherence to the provisions of mines act 1952 and subordinate legislations made there-under as applicable.	PA agreed to comply with.
ii.	No change in the mining method i.e. OC to UG, calendar programme and scope of work shall be made without obtaining prior approval of Ministry of Environment, Forest and Climate Change (MOEF&CC).	PA agreed to comply with.
iii.	Mining shall be carried out as per the provisions outlined in approved Mining Plan(including Mine Closure Plan) abiding by Mining laws related to the coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).	PA agreed to comply with.
iv.	No mining shall be carried out in the forest land without obtaining forestry clearance as per Forest (Conservation) Act, 1980 and also adhering to The Schedule Tribes and other Traditional Forest Dwellers (Recognitions of Forest Rights) Act, 2006 read with provisions of Indian Forest Act, 1927.	PA agreed to comply with. No forest land involved in the project
(b) Land Reclamation and Water Conservation		
i.	Digital survey of the entire lease hold area/core zone using Satellite Remote Sensing Survey shall be carried out regularly in three years for monitoring land use pattern and report in 1:50000 scale shall be submitted to Ministry of Environment, Forest and Climate Change/Regional Office (RO).	Complying with. As per the information provided, land use pattern of the mine lease area is being monitored through time series land use maps based on satellite imagery (IRS R2 L4FX). The latest report has been prepared in year 2017. As per the report, 136.03 ha. of area was under plantation, 32.88 ha. under backfilling, 101.71 ha. under active mining. Copy of the report has been submitted to Regional Office along with six monthly compliance report and also the same has been uploaded to company website.

ii.	The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of river /rivulet/pond/lake etc., shall be prepared and implemented by project proponent. The surface drainage plan and/or diversion of natural water courses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/GOI Authority. The construction of embankment to prevent any danger against in rush of surface water into the mine should be as per approved Mining Plan and permission of DGMS.	There are no surface water bodies like river/pond/lake in the mine lease area. The mining activities are being carried out by maintaining safe distance of more than 400 meters from the River Kanhan. As per the details provided embankment of length 5700 meters (width 30 meters and height of 6 meters) has already been constructed along the mine boundary towards the river side.
iii.	Final mine void depth should be preferably as per the approved Mine Closure Plan, and in case it exceeds 40 m adequate engineering intervention shall be provided for sustenance of aquatic life therein. The remaining area should be back filled and covered with thick and alive top soil. Post Mining land be rendered usable for agricultural /forestry purposes and shall be handed over to the respective State Government as specifies in the guidelines for Preparations of Mine Closure Plan issued by the Ministry of Coal dated 27-08-2009 and subsequent amendments.	PA agreed to comply with. As per the information provided, total quarry area will be 277.13 ha. 40 ha. will be backfilled and reclaimed. Another 30 ha. area will be back filled upto ground level. Remaining area will be converted into water body (with depth of 176 m.). PA submitted that 9.950 ha has been backfilled up to ground level and remaining area of about 31 ha is under backfilling.
iv.	The entire excavated area, backfilling, external OB dumping(including top soil) and afforestation plan shall be in conformity with the "during mining"/"post mining" land use pattern, which is an integral part of the approved Mining plan and the EIA/EMP submitted to this Ministry. Progressive compliance status vis-à-vis the post mining land use pattern shall be submitted to the Ministry of Environment, Forest & Climate Change/ Regional Office on six monthly basis.	PA agreed to comply with. PA submitted that mining activities are being carried out as per the approved mining plan. Till date, 9.95 ha of area is backfilled up to ground level. Plantation of 3, 93,905 no.s of saplings has been carried out over an area of 128.20 ha.
v.	The top soil shall temporarily be stored at earmarked site(s) only and it shall not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation purpose. Active OB dumps shall be stabilized with native grass species to prevent erosion and surface runoff. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforestrated in line with	PA agreed to comply with. Top soil has been dumped at designated place. As per the information provided it is being utilized for plantation. As per the information provided, total quarry area will be 277.13 ha. 40 ha. will be backfilled and reclaimed. Another 30 ha. area will be back filled upto ground level.

	the approved Mine Closure Plan. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change on six monthly basis.	
(c) Emissions, effluent and waste disposal		
i.	Transportation of coal, to the extent permitted by road shall be carried out by covered truck/conveyer. Effective control measures such as regular water/mist sprinkling/rain gun shall be carried out in critical areas prone to air pollution (with higher value of PM10/PM2.5) such as haul road, loading/unloading and transfer points. Fugitive dust emissions from all the sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/State Pollution Control Board.	Complying with. Coal transportation trucks are being covered with tarpaulin. Water sprinkling arrangement has been made on haul roads, CHP and coal transportation road. Black topped road has been provided for coal transportation. Avenue plantation has been provided. Mechanical sweeper has been provided for sweeping the coal transportation road periodically. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondagaon has been started by MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.
ii.	Green belt consisting of 3 tier plantation of width not less than 7.5 m shall be developed all along the mine lease area in a phased manner. The green belt comprising a mix of native species shall be developed all along the major approach/coal transportation roads.	Complying with. As per the information provided, plantation of 3,93,905 no.s of saplings has been carried out over an area of 128.20 ha. PA submitted that an area of 255 ha will be reclaimed biologically end of the mine life. Avenue plantation has been provided coal transportation road.
iii.	The transportation of the coal shall be carried out as per the provisions and route proposed in the approved Mining Plan. Transportation of coal through the existing road passing through the any village shall be avoided. In case, it is proposed to construct a "bypass" road, it should be constructed so the impact of sound, dust and accidents are appropriately mitigated	Complying with. Coal transportation road is not passing through any village. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondagaon has been started by MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.

iv.	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.	Complying with. Vehicles used for transporting the mineral are covered with tarpaulin. PA submitted that vehicles engaged in the mining activities are having valid PUC certificate. Also regular inspection is being done and the vehicles are being monitored continuously through CCTV camera.
v.	Coal stock pile/ crusher /feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors should be fully covered to avoid air borne dust. Side cladding all along the conveyer gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.	PA agreed to comply with. 10 nos. of fixed sprinklers are in operation near Weigh Bridge, along coal transportation road and portable sprinklers around coal stock yards. CHP has been provided with enclosures, side claddings and sprinklers. PA submitted that Installation of Comprehensive mist sprinkler system is proposed for dust suppression and control of air pollution in crushers, along conveyors belt, transfer points, bunkers of CHP and the same is expected to commissioned by March' 2019.
vi.	Coal handing plant shall be operated with effective control measures viz. bag filters /water or mist sprinkling system etc. to check fugitive dust emission from crushing operations, conveyer system, transfer points etc.	
vii.	Ground water, excluding mine water shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.	PA agreed to comply with. Mine pit water is being used for mining operations. PA submitted application vide dated 13.06.2016 to Central Ground Water Authority (CGWA) for obtaining NOC (for dewatering of ground water for mining operations) as the mine workings intersected ground water table. Application is pending with CGWA. PA submitted that mine discharge water after internal usage is being supplied to nearby Thermal Power Plants for industrial purpose and local populace for irrigation & domestic purposes. As per the information provided, roof top harvesting system will be provided for transit hostel and dispensary. Also a pond of Additionally, a pond of 382.50 m³ has been provided for the collection of rain water near Yeshamba village.
viii.	Catch/garland drains and siltation ponds of appropriate size shall be constructed around the mine working, coal heaps and OB dumps to prevent run off of water and flow of sediments directly into the river and water bodies. Further, dump material shall be properly	Complying with. As per the details provided two catch drains have been provided at the toe of the waste dumps. The dimensions are: 1. 1100 mtrs (L) x 3.5 mtrs (W) x 1.8 mtrs (D) 2. 400 mtrs (L) x 3.3 mtrs (W) x 2.00

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	consolidated /compacted and accumulation of water over dumps shall be avoided by adequate channels for flow of silt into the drains. The drains/ponds so constructed shall be regularly desilted particularly before on set of monsoon and maintained properly. Sump capacity should also provide adequate retention period to allow proper settling of silt material. The water so collected in the sump shall be utilized for dust suppression measures and green belt development. Dimension of the retaining wall constructed if any at the toe of the OB dumps within the mine to check run-off and siltation should be based on the rainfall data. The plantation of the native species to be made between toe of the dump and adjacent field/habitation/water bodies.	mtrs (D) PA submitted that the catch drains are desilted prior to monsoon. Garland drains have been provided around the quarry area with following dimensions: 1. 3100 mtrs (L) x 4.75 mtrs (B) x 2.25 mtrs. (D) 2. 450 mtrs (L) x 5 (B) mtrs x 1.6 mtrs (D). As per the details provided embankment of length 5700 meters (width 30 meters and height of 6 meters) has already been constructed along the mine boundary towards the river side. PA submitted the present embankment will be extended by 1500 meters for protection for future working area.
ix.	Industrial waste water generated from CHP, workshop and other waste water shall be properly collected and treated so as to conform to the standards prescribed under Environment Protection Act 1986 and the rules made there under and as amended from time to time. Oil and grease trap shall be installed and maintained fully functional with effluents discharged adhering to the norms. Sewage treatment plant of adequate capacity shall be installed for treatment of domestic waste.	Complying with. ETP of 100 KLD has been provided for the treatment of wastewater generated from the workshop. As per the monitoring data, the treated water quality found to be within the prescribed limits. Treated water is being reused in vehicle washing. Septic tanks and soak pits have been provided in the colony. PA submitted that STP based on MBBR technology will be installed for the colony.
x.	Adequate ground water recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby villages in case the village wells go dry due to dewatering of mine.	PA agreed to comply with. As per the information provided, roof top harvesting system will be provided for transit hostel and dispensary. Also a pond of Additionally, a pond of 382.50 m³ has been provided for the collection of rain water near Yeshamba village. PA submitted that mine discharge water after internal usage is being supplied to nearby Thermal Power Plants for industrial purpose and local populace for irrigation & domestic purposes.

(d) Illumination, noise & vibration

i.	Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. Report on the same shall be submitted to this ministry and its RO on six monthly	PA agreed to comply with. As per the information provided illumination is being maintained as per the DGMS notification no. DGMS(Legis.)

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	basis.	Circular no. 02 of 2017 Dhanbad dated 06.11.2017.
ii.	Adequate measures shall be taken for control of noise levels below 85 dBA (A) in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc. shall be provided with personal protective equipment (PPE) like ear plugs/muffs in conformity with prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.	Complying with. Earplugs and muffs have been provided for the workers engaged in drilling, blasting and HEMM operations. Noise levels are being monitored at 4 locations. As per the monitoring data, the noise levels found to be within prescribed standards.
iii.	Controlled blasting techniques should be practiced in order to mitigate ground vibrations and fly rocks as per the guidelines prescribed by DGMS.	Complying with. Controlled blasting is being carried out as per the DGMS guidelines. Delay detonators are being used to arrest the fly rocks and boulders.
iv.	The noise level survey shall be carried out and per the prescribed guidelines to assess noise exposure of the workman at vulnerable points in the mine premises and report in this regards shall be submitted to the ministry of /RO on six monthly basis.	PA agreed to comply with. PA submitted that noise level survey will be carried out to assess the noise exposure at vulnerable points through National Institute of Miners' Health (NIMH), Nagpur.

(e) Occupational health and safety

i.	The Project Proponent shall undertake an Occupational Health Survey for initial and Regular Periodical medical examination of the workers engaged in the Project and maintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS Circulars. Besides being regular periodic checkup, 20% of the workers identified from workforce engaged in active mining operations shall be subjected to health checkup for occupation disease and hearing impairment, if any.	Complying with. Medical checkup of the employees is being carried out as per the following schedule: 1. Once in 5 years for the people under 45 years of age 2. Once in 3 years for the people over 45 years of age PA submitted that initial (IME) and periodical medical examination (PME) is being carried out for permanent and outsourced employees. As per the information provided 56 IME and 133 PME has been carried out till date. Details of the medical examination are being submitted to Regional Office along with six monthly compliance report.

		PA submitted that medical examination of 20% work force will be carried out through external agency.
ii.	Personnel (including outsourcing employee) working in dusty areas should wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects	Complying with. Regular training is being provided for the workers at the vocational training centre on health and safety (as per DGMS norms) aspects. Personnel (including outsourced personnel) engaged in core zone operations are being provided with PPE like dust masks.
iii.	Skill training as per safety norms specified by DGMS shall be provided to all workman including the outsourcing employee to ensure high safety standards in mine.	
(f) Ecosystem and biodiversity conservation		
i.	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered flora/fauna, if any, spotted in the study area. Action plan in this regard if any shall be prepared and implemented in consultation with the State Forest and Wildlife Department.	PA submitted that as per EIA/EMP Studies no endangered flora & fauna species are reported and till date in the project area.
(g) Public hearing, R&R and CSR		
i.	Implementation of Action Plan on the issues raised during the Public Hearing shall be ensured. The Project Proponent shall undertake all the tasks and measures as per the Action Plan submitted with budgetary provisions during the Public Hearing. Land oustees should be compensated as per the norms laid out in the R&R Policy of the Company/ State Government/Central Government as applicable.	PA agreed to comply with. Project is carrying out CSR activities in nearby villages for the development of the infrastructure, water supply facilities, social empowerment, education, tarring of roads. As per the details provided an amount of Rs. 280.72 Lakhs has been spent on CSR activities from 2010-11 to till date. R&R Details: • Project Affected Families to be rehabilitated: 841 • Cost of land for rehabilitation: Rs.182.80 Crores • Land allotted: 21.66 ha. • Total no. of house holders: 721 • Already shifted to new rehab site: 400 • Employment provided: 13
ii.	The project proponent shall ensure the expenditure towards socio economic development in and around the mine, in every financial year in pursuance of the Corporate Social Responsibility Policy as per provisions of under Section 135 of the Companies Act, 2013.	

		• Monetary compensation: 14 Following amenities have been provided: 1. Primary School, Primary Health Center and Gram Panchayat Office 2. WBM road 3. Overhead tank of 2 lakhs liters 4. 2 no.s of Bore wells have been provided for drinking water 5. Plantation of 1100 trees completed 6. 2 no.s of cattle shed have been provided 7. Bank and Post Office
iii.	The project proponent shall follow the mitigation measures provided in this Ministries Office Memorandum No.Z-11013/57/2014-IA.11 (M), dated 29th October, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area".	There is no village/habitation within the lease area. Nearest village Gondegaon is under rehabilitation. PA submitted that necessary mitigation measures are being taken to avoid impacts of mining on nearby villages.
iv.	The Project Proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State Government to provide alternate areas for livestock grazing, if any. In this context, Project Proponent shall implement the directions of the Hon'ble Supreme Court with regard to acquiring grazing land.	As per the information provided, no grazing land is involved in the project area.

(h) Corporate Environment responsibility

i.	The Company should have a well laid down Environment Policy approved by the Board of Directors. The Environment Policy should prescribe for standard operating process/procedures to bring into focus any infringements /deviation/violation of the environmental or forest norms/conditions also, the company shall have a defined system of reporting non-compliances/violations of environmental norms to the Board of Directors and/or shareholders /stakeholders.	Copy of the environmental policy is enclosed as Annexure-1 .
ii.	The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions should be displayed on website of the	

	Company	
iii.	A separate environmental management cell both at project and company head quarter level, with suitable qualified personnel shall be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.	Complying with. Environmental management cell has been established at corporate level as well as project level.
iv.	Action plan for implementing EMP conditions shall be prepared and duly approved by competent authority. The year wise funds earmarked for environmental protection measures should be kept in separate account and not be diverted for other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with six monthly compliance report.	Complying with. As per the details provided, PA earmarked amounts of Rs. 147.09 Lakhs and Rs. 6/tonne of coal produced for capital and revenue expenditure for environmental protection measures. PA submitted that an amount of Rs.431.09 Lakhs has been spent over environmental protection measures till date under revenue expenditure. Also Rs.131.37 Lakhs have been spent under capital expenditure.
v.	Self-environment audit shall be conducted annually. Even three years third party environment audit shall be carried out.	PA agreed to comply with.
(i) Statutory Obligations		
i.	The environmental clearance shall be subject to orders of Hon'ble Supreme Court of India, Hon'ble High Court, NGT and any other Court of Law from time to time, and as applicable to the project.	PA agreed upon.
ii.	This environmental clearance shall be subject to obtaining wide life clearance, if applicable, from the standing committee of National Board for wild life.	No forest land is involved. There are no eco-sensitive areas within 10kms of the project.
iii.	The project Proponent shall obtain Consent to Establish/Operate under the Air Act, 1981 and the Water Act, 1974 from the concerned State Pollution Control Board.	MPCB granted consent to establish for expansion of coal mining activity from 2.5 MTPA to 3.5 MTPA vide letter no. BO/CAC Cell/UAN no. 0000041397/ R/ CAC-1804000354 dated 07/04/2018. Application regarding Consent to Operate for capacity upto 3.5 MTPA was submitted to MPCB on 30.01.2018 and the same is pending with MPCB.
iv.	The Project Proponent shall obtain the necessary prior permission from the Central Ground Water Authority.	PA agreed to comply with. Application for grant of NOC for dewatering of Groundwater has been applied vide WCL/ENV/HQ / 27J & 17 E / 263 dated 13.06.2016. Application is

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		pending with CGWA.
(j) Monitoring of Project		
i.	Adequate ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring of the pollutants, namely PM10, PM2.5, SO2 and NOx. Location of the station shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Online ambient air quality monitoring stations may also be installed in addition to the regular monitoring stations as per the requirement and/ or in consultation with the SPCB. Monitoring of the heavy metals such as Hg, As, Ni, Cd, Cr, etc. carried out at least once in six months.	Complying with. Ambient air quality is being monitored at 5 locations through Central Mine Planning & Design Institute (CMPDI) Limited, Regional Institute, Nagpur. As per the monitoring data, the air quality levels found to be within prescribed standards. Also the heavy metal levels in ambient air quality were monitoring during April 2018. Monitoring reports are being submitted to Regional Office along with six monthly compliance report.
ii.	The ambient air quality monitoring in the core zone shall be carried out to ensure the Coal Industry Standard notified vide under GSR 742 (E) dated 25.09.2000 and amended from time to time by Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr, etc. and other monitoring data shall be regularly reported to the Ministry/ Regional Office and to the CPCB/SPCB.	
iii.	The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Coal Industry Standards of GSR 742 (E) dated 25.09.2000 and as amended from time to time by Central Pollution Control Board.	Complying with. ETP of 100 KLD has been provided for the treatment of wastewater generated from the workshop. A sedimentation pond has been provided for the treatment of mine pit water. As per the monitoring data, the treated water quality found to be within the prescribed limits.
iv.	The monitoring data shall be uploaded on the company website and displayed at the project site at a suitable location. The circular no.J-20012/1/2006/1A.11(M) dated 25.09.2000 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this	Complying with. Environmental monitoring reports are being uploaded onto company's website regularly.

	regard for its compliance.	
v.	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring of ground water level shall be carried four times in a year pre- monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year and the data thus collected shall be sent regularly to Ministry of Environment, Forest and Climate Change /Regional Office.	Complying with. Ground water level and quality are being monitored through Central Mine Planning & Design Institute (CMPDI) Limited, Regional Institute, Nagpur at 13 locations four times in a year. Monitoring data is being submitted to Regional Office as per the stipulation.
vi.	Monitoring of water quality upstream and downstream of water bodies shall be carried out once in 6 months and record of monitoring data shall be maintained and submitted to Ministry of Environment, Forest and Climate Change /Regional Office.	Complying with. Monitoring is being carried out at three locations of Kanhan River comprising of 1 upstream location (near sangham) and 2 downstream (mine discharge point, and near Juni Kamptee) locations. Last monitoring was carried out in June 2018. Monitoring reports have been submitted to Regional Office along with six monthly compliance report.
vii.	Project proponent shall submit six monthly reports on the status of the implementation of the stipulated environment conditions to the Ministry of Environment, Forest and Climate Change and its Regional Office. For half yearly monitoring reports data should be monitored for the period April to September and October to March of the financial years.	Complying with. PA submitted the six monthly compliance reports regularly since the grant of EC.
viii.	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data/information / monitoring reports.	PA agreed upon.
(k) Miscellaneous		
i.	Efforts should be made to reduce energy consumption by conservation, efficiency, improvements and use of renewable energy.	PA agreed to comply with. As per the information provided rooftop solar system has been installed for office and residential buildings which resulted in

		reduction in power consumption by 1108290 KWH.
ii.	The project authorities shall inform to the Regional Office regarding commencement of the mining operations.	This is an existing mine.
iii.	A copy of Environment clearance letter shall be marked to concern Panchayat. A copy of the same shall be sent to the concerned State Pollution Control Board, Regional Office, District Industry Sector and Collector's Office/ Tehsildar Office for information in public domain within 30 days.	Complied. Copy of the environmental clearance has been submitted to Gondegaon Gram Panchayat vide letter dated 10.04.2018.
iv.	The EC shall be uploaded on the company's website. The, compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in public domain.	Complying with. PA uploaded the copies of environmental clearance as well as the six monthly compliance report to company website.
v.	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment, Forest and Climate Change at www.environmentclearance.nic.in and a copy of the same should be forwarded to the Regional Office.	Complied. Advertisement has been made as per the stipulation.
vi.	The Environmental Statement for each financial year ending 31 March in Form-V is mandated to be submitted by the Project Proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the Company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF & CC by e-mail. Concerns raised during public hearing.	Complying with. Environment statement has been submitted to MPCB on 20.09.2018. Copy of the same has been uploaded to company website. Also the same has been submitted to Regional Office along with six monthly compliance report.

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vii.	The above conditions will be enforced inter alia under the provision of the Water Act, 1974 and Air Act, 1981, Environment Protection Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and their Rules and any other order passed by Hon'ble Supreme Court of India /High courts and any other court of law to the subject matter.	PA agreed to comply with.
5.	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during presentation to the EAC. All the commitments made on the issue raised during public hearing shall also be implemented in letter and spirit.	PA agreed to comply with.
6.	The proponent shall obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection.	PA agreed to comply with.
7.	Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	PA agreed to comply with.
8.	Any appeal against this environmental clearance shall lie with the National green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National green Tribunal Act, 2010.	PA agreed to comply with.
9.	The coal company/project proponent shall be liable to pay the compensation against the illegal mining, if any, and as raised by the respective State Governments at any point of time, in terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP (Civil) No. 114/2014 in the matter of 'Common Cause Vs Union of India & others'.	PA agreed to comply with.
10.	The project proponent, without prejudice to this EC, shall be bound to comply with any other interpretation of the orders of Hon'ble Supreme Court also, in due course of time.	PA agreed to comply with.

11.	This EC supersedes the earlier EC granted vide Letter No. J-11015/106/2009-IA.II(M) dated 15TH July, 2009 for 2.5 MTPA capacity to Gondagaon OCP in a Total area of 917 ha.	PA agreed to comply with.

A. Suresh Kumar
 21/01/19
 Scientist 'D'
 SURESH KUMAR ADAPA
 वैज्ञानिक 'डी'
 SCIENTIST 'D'
 पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
 Ministry of Environment, Forest & Climate Change
 क्षेत्रीय कार्यालय (परिवहन राज्य क्षेत्र)
 Regional Office (WCZ)
 नागपुर / Nagpur - 440001

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Summary Note

1. Implementation of Conditions:

Site inspection has been carried out on 03.01.2019. Ministry granted environmental clearance vide letter dated 14.03.2018 for the project for expansion of coal mine from 2.5 MTPA to 3.5 MTPA for a period of one year. Maximum production achieved till date is 3.16 million tonnes during 2017-18. As per the details provided, construction works at rehabilitation site of the Gondagaon village completed and 400 families already shifted to the rehabilitation site. Backfilling of mine out area is in progress. An area of 9.950 ha has been backfilled up to ground level and about 31 ha. area is under backfilling. Plantation has been carried out over an area of 128.2 ha. Embankment of 5.7 km provided for the Kanhan River. Water sprinkling system has been provided for the coal handling plant, haul roads, coal stock yards. PA submitted that the installation of Pipe Conveyor system for transport of Coal from five OC mines of WCL including Gondagaon has been started by MAHAGENCO. After commissioning of the same, the transport of coal by railway siding will be completely eliminated.

2. Review w.r.t to MOEFs letter dated 30.5.2012:

The above mentioned report is prepared after site visit on 03.01.2019 for the extension of validity of environmental clearance issued for expansion of Gondagaon OCP (from 2.5 MTPA to 3.5 MTPA) of Western Coalfields Limited, Dist. Yavatmal, Maharashtra. Compliance status is based on the observations made during the site visit.

3. Court Cases and show cause/closure notices:

PA submitted undertaking that

- i. There are no court cases pending against the project
- ii. There are no show cause notices issued by MPCB are pending against the project.

MPCB granted consent to establish for expansion of coal mining activity from 2.5 MTPA to 3.5 MTPA vide letter no. BO/CAC Cell/UAN no. 0000041397/ R/ CAC-1804000354 dated 07/04/2018.

Application regarding Consent to Operate for capacity upto 3.5 MTPA was submitted to MPCB on 30.01.2018 and the same is pending with MPCB.

4. Uploading of compliance on web site: With regard to uploading of EC and compliance of conditions along with analytical reports on the web site of the company, PA uploaded the copies of EC, compliance and analytical reports to the website.

A. Surash Kumar
21/01/19
सुरेश कुमार अदपा
SURESH KUMAR ADAPA
वैज्ञानिक 'डी'
SCIENTIST 'D'
पर्यावरण, वन एवं जलवायु परिवर्तन विभाग
Ministry of Environment, Forest & Climate Change
औद्योगिक क्षेत्र (पश्चिमी चम्पा) क्षेत्र
Regional Office (WCL) 23/5



COAL INDIA LIMITED

CORPORATE

ENVIRONMENTAL

POLICY

2012





Environmental Policy Statement:

Coal India Limited (CIL) is committed to protect the environment through prevention, mitigation of pollution, proper disposal and recycling of wastes, conservation of bio-diversity and bringing awareness among all its stakeholders for continual improvement in environmental performances following the best practices.

OBJECTIVES:

Coal India Limited shall endeavour to:

- 1. Conduct mining and associated operations in an environmentally responsible manner to comply with applicable laws and other requirements related to environmental aspects and Design Projects with due consideration of Sustainable Development.**
- 2. Prevent pollution of surrounding habitation by continuous monitoring and adopting suitable measures for environment protection.**
- 3. Ensure compliance of Environment Clearance (EC) and Forestry Clearance (FC) conditions and other statutory conditions issued by regulatory agencies.**
- 4. Implement Environment Management Plans (EMP) in all mines effectively to mitigate pollutions of air, water, noise and land caused by mining operations.**
- 5. Strive to conserve bio-diversity.**
- 6. Conserve natural resources through the principle of REDUCE, REUSE, RECYCLE, REDEFINE and REPLACE. Put special thrust on efficient energy utilization as a measure to reduce carbon foot-print.**
- 7. Strive for continual improvement in our environmental performances by setting targets, measuring progress and taking corrective actions.**
- 8. Create awareness about environment among the employees and the local communities through pro-active communication and training.**

Strategies for Implementation of Environmental Policy:

Back Ground:

CIL subscribes to the view of Sustainable Development. Unless the environment can sustain the developmental activities, any pursuit of development in isolation can cause irreparable damage to the ecosystem and associated environmental attributes. Keeping this view in mind, CIL attaches top priority towards eco-friendly sustainable development and approved its 'Corporate Environmental Policy' in December 1995. However, the present policy is the amendment of 1995 Policy and is complimentary to the National Environmental Policy.

The modification in the present policy is the outcome of the experiences gained since 1995 and incorporating the modifications / amendments made time to time in environmental policies and additional requirements notified by Ministry of Environment & Forest (MOEF) and other statutory organisations concerning mine closure, reclamation of degraded land, environmental & forestry clearance etc. and also with the objective of revisiting the corporate policy.

This Policy has a vision of Green Mining and mission of 100% compliance of environmental statutes applicable to coal mining industry.

Strategies: CIL adopts the strategies appended below for effective implementation:

1. Mine Planning on Sustainable Development:

- a) Coal, being a non-renewal energy source, extraction shall be planned prudently to meet national requirement. The projects shall be designed on the principle of Sustainable Development with due consideration to environment, safety and aspirations of the stakeholders at the planning stage itself.
- b) While preparing the Project Reports, the efforts shall be to incorporate latest mining equipments with higher capacity and mining technologies those are more environments friendly.

2. Environmental Impact Assessment (EIA) & Environment Mitigation Plan (EMP)

- a) Mining shall be carried out to facilitate the maintenance of stipulated environmental standards of quality of various pollutants within the limits under the relevant acts, statutes and National Environmental Policy 2006.
- b) EIA and EMP for all new and existing mines, washeries, central and regional workshops and other industrial units shall be formulated as per MoEF guide lines for obtaining Environmental Clearance (EC). Similarly, in the existing projects for enhancement of production capacities with or without increase in land, change of technology and renewal of lease etc. fresh EC is required to be sought as per norms. Further, the operations in these units shall be guided by the consent letters for air and water issued by the respective State Pollution Control Boards (SPCB).
- c) Detailed Mine Closure Plans shall be prepared for all existing and new mines as per the MoC (Ministry of Coal) guidelines.

3. Compliance of the statutory requirements:

The implementation of EMP and fulfillment of all other statutory requirements like conditions of EC, FC and consents to establish & operate, including timely submission of returns to statutory bodies and various agencies, are to be ensured at all levels.

4. Measures to mitigate pollution:

a) Air Pollution:

- i) Generation of dust is to be controlled at the source to the possible extent with necessary measures during drilling, loading, unloading, CHP transfer points etc.
- ii) Dust generation is to be minimized along coal / waste transportation roads.
- iii) Green belt is to be created around the source of dust.

b) Water Pollution

i) The mine water and other effluent shall be treated effectively to ensure the discharge norms as per statute. The treated effluent shall be utilized to the extent possible with a view to achieve maximum water conservation.

ii) Oil & grease from the effluent shall be removed by Oil & Grease Traps.

c) Noise / ground vibration:

i) All measures to minimise noise pollution will be taken including provision of ear muffs / plugs etc. and rotation of place of deployment.

ii) Controlled blasting techniques shall be followed to reduce ground vibration as well as noise pollution.

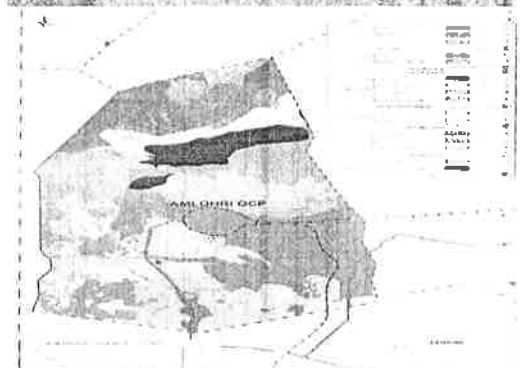
d) Land Reclamation:

i) Progressive and concurrent reclamation of mined out areas will be carried out as per approved EMP and Mine Closure Plan (MCP).

ii) Slopes of external dumps are the important area to be suitably graded / terraced for effective reclamation and plantation.

iii) Preservation of top soil is required for future use. Old as well as existing non-active dumps are to be technically and biologically reclaimed through scientific studies.

iv) Monitoring of reclamation work of all coalfields and opencast mines will be done through Satellite Surveillance. The outcome shall be put in the websites.



e) Mine Closure Plans:

Detailed MCP shall be prepared for each mine. MCP are being delineated in two phases viz. progressive and final mine closure. Appropriate funds are set aside and deposited under a special Escrow fund every year as per MoC guidelines to be utilized for proper and final mine closure.

f) Mine Fire:

CIL shall endeavour to reduce occurrence of mine fire and subsidence in built-up areas. Action Plan for mine fire control shall be implemented. Monthly report shall be submitted to top management of the subsidiary and CIL and Quarterly to company board. Monitoring will be done through Satellite Surveillance.

g) Monitoring:

- i) All receptors in and around the mining projects will be monitored regularly to assess the efficacy of the pollution control / mitigation measures to ensure air & water quality and noise level within standards.
- ii) Effect of mining on the hydrology of the area will be monitored through measurement of water level and its quality of nearby wells and bore holes provided for this purpose. Conservation of water through rain water harvesting shall be taken up.
- iii) Area and unit environmental cells shall have regular interaction with the people in and around the coal mines and other allied units on matters related to environment to take necessary and timely corrective actions.
- iv) Environmental initiatives and monitoring through Internal Environmental Audit will be conducted for generating useful data for taking corrective actions and mitigation measures.
- v) The annual budget (revenue & capital) shall be prepared based on the action plan including monitoring of various bench marks and the budget utilisation.

h) Other measures:

- i) Special emphasis shall be given to undertake R&D related to various facets of coal mine environmental management in collaboration with Central Mine Planning and Design Institute (CMPDI) and other competent institutions.
- ii) Besides ensuring statutory compliance, the CIL desires to set high standards and continual improvement.
- iii) A number of mines and establishments of CIL are ISO 14001 certified and balance mines and establishments shall be ISO 14001 certified in phased manner.

5. Preservation of bio-diversity:

- a) This will start from mine planning including technically and biologically reclamation of mined out areas in collaboration with State Forest Departments, Wild Life Divisions, NGOs etc. working in the fields of bio-diversity conservation.
- b) The selection of species for plantation shall be done in consultation with the local community to include the local species and their preferences, if any.

6. Coal Beneficiation / Coal washeries:

- a) For beneficiation of Run off Mines (ROM) coal, washeries are being set up in a phased manner as per requirement.
- b) Slurry Management System (SMS) in all washeries shall be organised to ensure collection of fines, gainful utilization of rejects viz. power generation in Fluidized Bed Combustion (FBC) plants, selling to brick manufacturers or adopting other environmental friendly disposal options.
- c) The reject dumps and tailings shall be suitably treated to avoid any contamination.
- d) The effluent from washeries including tailings pond shall be suitably treated and reused to minimize water consumption with zero discharge concept.

7. Conservation and Clean Technology:

- a) R&D projects shall be taken up to promote clean coal technology and improve the existing technologies.
- b) Energy saved is energy produced. A system may be evolved to conduct regularly energy audit voluntarily to take corrective actions to reduce carbon foot print.
- c) Clean Development Mechanisms will be explored for reducing emission of Green House Gases by exploration, identification, preparation of projects reports for extraction of methane from Coal Bed, Coal Mine, Abandoned Mine, Ventilation Air, UG Coal Gasification, generation and utilisation of renewable energy etc.



8. Awareness Programmed:

- a) Publicity and propaganda to generate awareness through exchange & communication of information, news letters and periodicals on environment, seminars, work-shops, celebration of World Environment Day etc. at CIL / Subsidiary HQs, Areas & units shall be undertaken. Regular training programmes will be organised at various levels to inculcate awareness among employees.
- b) Courses on environmental and forestry laws and Environmental Protection Measures and the corporate Policy shall be organised for project executives for improving knowledge.
- c) CIL shall give annual awards for achieving excellence in environment related issues and activities. These awards will be in recognition for implementation

of EMP, land reclamation and compliance of statutes, proper maintenance of air & water quality and noise level.

Implementation of Policy:

i) **Manpower:** CIL shall have environmental divisions at decision making & operational levels in its structure. The environment department shall be set up and strengthened at:

- i) CIL Corporate HQ at Kolkata
- ii) Subsidiary HQs
- iii) Areas / Units / Collieries / Workshops / Washeries
- iv) CMPDI (HQ) & CMPDI Regional Institutes

ii) **Roles and Responsibilities:** The environmental department, set up at company HQs, Areas and Unit levels with appropriate manpower and resources, shall be responsible for implementation of policy, obtaining EC, FC, consent to establish & operate, statutory requirements and undertaking mitigation measures besides preparation of action plan every year and also to intimate the status of implementation to the management regularly.

Possibilities of entering into joint Venture with the agencies having expertise on the Mine reclamation activities are to be explored.

iii) **Funding the environmental activities:** For projects having approved EMPs, the capital and revenue fund provision for environmental activities has been provided in its project report. For other units, suitable provision shall be kept in the revenue budget as per the requirements. The fund earmarked shall be spent exclusively on environmental purposes and measures only.

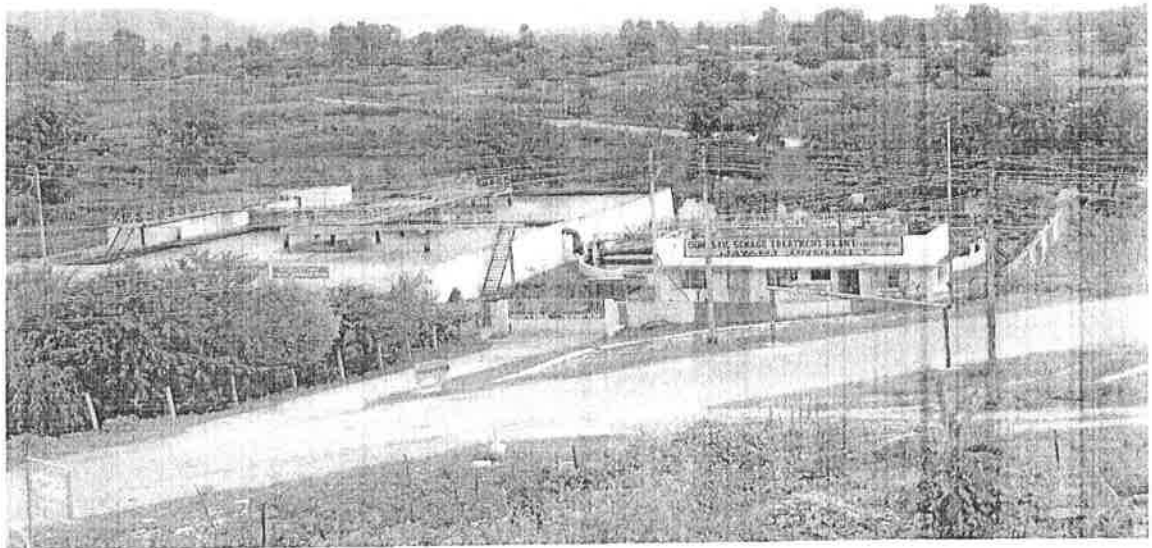
As per the guidelines of MoC, the cost of mine closure shall be provided in the mine closure plan and deposited as ESCROW fund which shall be utilized for mine closure activities.

iv) **Environmental Cost Code:** As a policy, the cost code for environment related activities has been put in place, for generation of data on expenses incurred for environmental safeguards. This will help to monitor cost effectiveness of

environmental control measures undertaken and help frame future budget provisions.

Review of Environmental Policy:

In view of the present fast changing social, economic and environmental scenario, this Policy shall be reviewed every 5 years to incorporate the changes in the legal, technical, environmental, economic and social inputs prevailing at that time. Whenever, there is change in National Environmental Policy or other National / State relevant policies, Acts etc, this Corporate Environmental Policy would be reviewed and suitably revised.



Western Coalfields Limited

(Kasturba Nagar, Jaripatka, Nagpur - 440 014.)
(A Subsidiary of Coal India Limited)

Office of the Sub Area Manager
Gondegaon Sub Area, Nagpur Area

उप क्षेत्रीय प्रबंधक का कार्यालय
गोंडेगाव सब एरिया, नागपुर एरिया

Ref no.WCL/GM(M)/SAM/GSA/2018/

Date 10.09.2018

CERTIFICATE/UNDERTAKING

This is being certified that no court cases/show cause notice case is pending related to the Environment Activities of the Expansion of Gondegaon Extension Open Cast Coal Mine Project of Nagpur Area of WCL.


GM (M)/Sub Area Manager,
Gondegaon Sub Area,
Nagpur Area, WCL

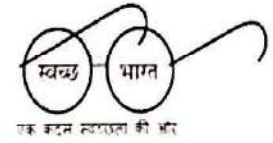
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Western Coalfields Limited
 (A Govt. of India Undertaking)
 (A Mini Ratna Company)
 (Subsidiary of Coal India Limited)

Website- www.westerncoal.gov.in

O/O. Sub Area Manager
 Gondegaon Sub Area
 Nagpur Area
 Post: Gondegaon, Tah: Parseoni
 Dist- Nagpur - 441404
 Maharashtra



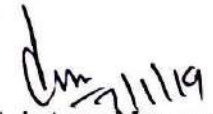
Regd Office- Coal Estate, Civil Lines Nagpur - 440001

Ref no.WCL/GM(M)/SAM/GSA/2018-19/23

Date 07.01.2019

CERTIFICATE/UNDERTAKING

This is being certified that no court case is pending related to the Environment Activities of the Gondegaon Extension Open Cast Coal Mine Expansion Project of Nagpur Area of WCL.


 GM (M)/Sub Area Manager,
 Gondegaon Sub Area,
 Nagpur Area, WCL