

**EXECUTIVE SUMMARY**  
**of**  
**ENVIRONMENTAL IMPACT ASSESSMENT**  
**&**  
**ENVIRONMENTAL MANAGEMENT PLAN**  
**FOR**  
**PUBLIC HEARING**

**As per EIA Notification, 2006**  
**OF**

**GADEGAON OPEN CAST MINE**

**Village - Gadegaon , Tehsil - Korpana , Dist - Chandrapur ,**  
**State - Maharashtra**

**Wani Area,**

**Western Coalfields Limited**

**for**

**Production Capacity of 3.00 MTPA and ML Area of 615.56 Ha**  
**(PREPARED AS PER TOR Identification No.**  
**TO25A0101MH5958827N dated 08.07.2025 )**



**May-2026**

**Prepared by**  
**CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED**

(Accredited vide Certificate No. NABET/EIA/25-28/RA 0412 Valid till 08.04.2028)

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# **Executive Summary**

## **1.0 INTRODUCTION**

The Ministry of Coal (Government of India) intends to increase the coal production from the coal mines of Coal India Limited in the wake of increasing demand of power grade coal by thermal power plants in the country. Hence, Western Coalfields Limited (WCL) has envisaged to commence coal production from its Gadegaon Opencast Project for capacity of 3.00 MTPA

The project is listed under activities 1(a) Mining of Minerals Coal (>500Ha) under the Schedule of EIA Notification, 2006 and categorized as Category-A which means it is to be appraised at the Central level. As per the notification, the projects require prior Environmental Clearance (EC) from Ministry of Environment, Forest & Climate Change ( MoEF&CC ), Government of India. Hence, WCL has followed due course of procedure for obtaining Environmental Clearance. As a part of the procedure, application to MoEF&CC for obtaining Terms of References ( ToR ) for conducting the EIA study was submitted online vide proposal no. IA/MH/CMIN/532813/2025 dated 28/04/2025. The proposal was considered in the 27th EAC (Coal Mining) meeting held on 18-19th June 2025, wherein the ToR for the project was recommended.

Terms of Reference ( ToR ) for Gadegaon project was granted by MoEF&CC vide File No. J-11015/46/2009- IA.II (M), ToR Identification no. TO25A0101MH5958827N dated 08.07.2025 for production capacity of 3 MTPA and total lease area of 615.56 Ha. (Refer Annexure No.-1).

Draft EIA/EMP Report has been prepared in line with the EIA Notification, 2006 and covering the scope of work as defined in the Specific Conditions and Standard Conditions prescribed in the ToR letter dated 08.07.2025.

### **1.1 Location**

GADEGAON Opencast Mine is located on the Korpana Tahsil of Chandrapur District of Maharashtra. The project area is bounded by latitudes 19°47' 30" (N) and 19°52' 30" (N) and longitudes 79°05'00" (E) and 79°15'00" (E). The National grid coordinates are Northing N-1060000 & 1067000 and Easting E-3009000 & 3018000. The area is covered by Survey of India Toposheet No. 56M/1.

### **1.2 Communication**

The proposed Gadegaon OC is a Greenfield project located in Gadegaon Village of Korpana Tehsil, Chandrapur District of Maharashtra State. The Chandrapur district township is located at a distance of about 40 km from the block via Ghughus . Ballarshah town is located in the eastern part of the block at a distance of about 35 km. Delhi Chennai Grand Chord Railway line passes through Ballarpur Township, which is nearest railway station.

The block is well connected by road via Rajura , Gadchandur and Awarpur . The project can also be accessible from Ghughus OC / Mungoli OC side by crossing the bridge over Penganga River. An approach road to the project is proposed from the bridge on Penganga River over the dip side existing embankment of Penganga OC Mine.

The project is also connected with Nagpur by all-weather road. The nearest airport is Nagpur. Gadegaon village is located in the central part of the area situated on both sides of PWD road from Chandrapur to Antargaon . This village is proposed for shifting and rehabilitation.

### **1.3 Topography & Drainage**

The entire area of the mine is covered by agriculture land and exhibits a gently undulating topography.

The main drainage of the area is controlled by Easterly flowing Wardha River in the North and North-Easterly flowing Penganga River in the central part of the study area. The Penganga River joins Wardha River near Jugad village. The part of proposed mine area is under the HFL of Wardha river & Penganga River, (recorded HFL is 185.165 m in the year 1959). In the project report it is proposed to make a flood protection embankment 6.0 m above HFL around the proposed mine. It is also proposed in the project report that pitching of embankment on river side may be done upto HFL level to further strengthen the proposed embankment.

### **1.4 Climate & Rainfall**

The area is characterized by subtropical climate. The highest day time temperature recorded is 48 °C, and during winter season it goes down to 10 °C. The monsoon is normally active during the period from 15<sup>th</sup> June to 15<sup>th</sup> September.

The annual rainfall data record at Korpana tehsil, Chandrapur district is minimum 670 mm and maximum of 1800 mm. The area is covered with very good fertile cultivable land. The area is on the eastern bank of perennial Penganga river and is the main

source of drainage. The crops grown are Jowar , Cotton, Pulses and wheat etc. The wind direction varies from north easterly in November to westerly in June.

## 2.0 GEO-MINING PARAMETERS

The geo-mining characteristics of the proposed quarry are as follows:-

### Geo-Mining Parameters

Sr.No.	Particulars	Quarry
1	Area of the Quarry	
(a)	On floor (ha)	241.00
(b)	On surface (ha)	400.00
2	Average length (m) on floor	1250
3	Average width (m)	
(a)	At surface	1700
(b)	At floor	1200
4	Depth (m)	
(a)	Initial	25
(b)	Final	220
5	Gradient of seam	1 in 4.5 to 1 in 12
6	Average thickness of seam (m)	17.39
7	Mineable reserves (Mt)	53.75
8	Total OB (Mm <sup>3</sup> )	351.36
9	Average SR (m <sup>3</sup> /t)	6.54
10	Grade/GCV ( k.Cal ./kg.)	G10 /4344

### Type and Method of Mining Operations

Surface Miner technology has been successfully introduced in some mines of WCL and in many mines of CIL for coal extraction. This technology avoids drilling, blasting, crushing of coal and related environmental hazards. There is scope for improvement in quality of ROM coal by removing thin bands during extraction of coal by surface miner. Ideally, coal exposure of about 400m length and 50m is required for optimum performance of surface miner. The angle of operating batter is comparatively flatter in surface miner system generating more OB compared to shovel dumper mining if the seams are thin. Moreover, deployment of surface miner helps in selective mining and resulting in improvement of Coal Quality. Hence, deployment of surface miner is

proposed in Gadegaon OC considering flat gradient in larger part of the quarry area of coal seam / sections and in view of improving coal quality. However in some areas of quarry where gradient is comparatively steeper, coal mining can also be considered by shovel/dumper system at the time of execution.

Considering all the factors detailed above, it is proposed to adopt Shovel Dumper System of mining for removal of Top OB in proposed mine. Surface Miner with Front End loader and Dumper system has been proposed in this report for extraction of coal. With Shovel-Dumper system, two stripping methods are possible:

1. Inclined Slicing method
2. Horizontal Slicing method

For gradient of seams steeper than 1 in 4, positioning of HEMM is difficult in inclined slicing method where benches in coal are made parallel to the seam, hence horizontal slicing method is proposed. However, in the proposed Gadegaon OC mine, since the gradient of seam is flat (1 in 4.5 to 1 in 12.40), therefore inclined slicing method has been proposed.

The points in favor of shovel-dumper and surface miner mining system are:

General dip of the seam is 1 in 4.5 to 1 in 12.

Mining of multiple seams ie Upper band, Section A+B+C combined, Local section and Section D seams.

Large scope of work including 3.00 Mt of coal and 24.00 Mm<sup>3</sup> of OB per annum (peak).

### **3.0 DESCRIPTION OF ENVIRONMENT AND ANTICIPATED IMPACT**

The present scenario has been assessed by the baseline data generated from January 2024 to March 2024. Summarized baseline data is provided below:

#### **3.1 Micrometeorology**

Meteorological data of one season (Jan'24 to Mar'24) collected at a meteorological station located within the core zone of the project has been considered and it 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  $\leq 0.5$  m/sec to 7.3 m/sec. The seasonal average wind speed was observed to be 2 m/sec.

The analysis of wind pattern during the season showed that the predominant wind directions were from North East.

### **Temperature**

Temperature values ranged between 13.1 ° C to 42.5 ° C. The seasonal average temperature value during this period was found to be 27.5 ° C.

### **Relative Humidity**

The daily average relative humidity values were in the range of 9.6 to 96.9%. The seasonal average humidity value was found to be 39.4%.

### **Cloud Cover**

Mostly clear sky was predominant during the study period.

### **Rainfall**

Total 20.7 mm rainfall was recorded during the study period. The average rainfall during the season was found to be 1334.40 mm for Vidharba Region.

## **3.2 Executive Summary of AAQM**

Baseline ambient air quality has been generated at twelve locations from Jan'24 to Mar'24. The summary of ambient air quality baseline status is given below:

<b>Particulate Matter (PM<sub>10</sub>) (Buffer Zone), µg/m<sup>3</sup></b>					
<b>Location Name</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>	<b>98 Percentile</b>	<b>GSR 826 E</b>
Wadgaon	70	85	80	85	100
Bhakardi	68	75	72	75	100
Sakhra Village	48	70	60	70	100
Bhoyegaon Village	48	70	60	70	100
Shiwani Old	66	75	71	75	100
Awarpur	66	75	71	75	100
Wanoja Village	67	75	71	75	100
Kadoli Khurd	59	81	74	81	100
Antargaon	60	76	71	76	100
Sonurli	74	82	77	81	100
Pimpri	66	76	71	76	100

<b>Particulate Matter (PM<sub>10</sub>) (Core Zone), µg/m<sup>3</sup></b>					
<b>Location name</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>	<b>98 Percentile</b>	<b>SR 742 (E)</b>

Gadegaon Village	71	97	85	97	100
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<b>Particulate Matter (PM<sub>2.5</sub>) (Buffer Zone), µg/m<sup>3</sup></b>					
<b>Location Name</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>	<b>98 Percentile</b>	<b>GSR 826 E</b>
Wadgaon	23	41	31	41	60
Bhakardi	28	44	35	44	60
Sakhra Village	15	33	23	33	60
Bhoyegaon Village	15	33	23	33	60
Shiwani Old	21	36	30	36	60
Awarpur	25	39	32	39	60
Wanoja Village	18	34	26	34	60
Kadoli Khurd	22	38	29	38	60
Antargaon	22	38	29	38	60
Sonurli	27	43	32	42	60
Pimpri	22	39	30	39	60

<b>Particulate Matter (PM<sub>2.5</sub>) (Core Zone), µg/m<sup>3</sup></b>					
<b>Location Name</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>	<b>98 Percentile</b>	<b>GSR 742 (E)</b>
Gadegaon Village	23	46	31	46	60

<b>Particulate Matter (SO<sub>2</sub>) (Buffer Zone), µg/m<sup>3</sup></b>					
<b>Location Name</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>	<b>98 Percentile</b>	<b>GSR 826 E</b>
Wadgaon	<10	<10	<10	<10	80
Bhakardi	<10	<10	<10	<10	80
Sakhra Village	<10	<10	<10	<10	80
Bhoyegaon Village	<10	<10	<10	<10	80
Shiwani Old	<10	<10	<10	<10	80
Awarpur	<10	<10	<10	<10	80
Wanoja Village	<10	<10	<10	<10	80
Kadoli Khurd	<10	<10	<10	<10	80
Antargaon	<10	<10	<10	<10	80
Sonurli	10	13	11	13	80

Pimpri	<10	<10	<10	<10	80
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Particulate Matter ( SO <sub>2</sub> ) (Core Zone), µg/m <sup>3</sup>					
Location Name	Minimum	Maximum	Average	98 Percentile	GSR 742 (E)
Gadegaon Village	10	11	11	11	80

Particulate Matter (NO <sub>x</sub> ) (Buffer Zone), µg/m <sup>3</sup>					
Location Name	Minimum	Maximum	Average	98 Percentile	GSR 826 E
Wadgaon	9	16	12	16	80
Bhakardi	10	17	14	17	80
Sakhra Village	8	15	11	15	80
Bhoyegaon Village	8	15	11	15	80
Shiwani Old	8	16	13	16	80
Awarpur	8	15	11	15	80
Wanoja Village	7	17	13	17	80
Kadoli Khurd	10	19	15	19	80
Antargaon	10	19	14	19	80
Sonurli	8	19	13	19	80
Pimpri	8	15	12	15	80

Particulate Matter (NO <sub>x</sub> ) (Core Zone), µg/m <sup>3</sup>					
Location Name	Minimum	Maximum	Average	98 Percentile	GSR 742 (E)
Gadegaon Village	10	19	13	19	80

### **Observation**

- 1 The air quality impact prediction study has been carried out for the worst case scenario arising in the 10<sup>th</sup> year of mine life. Since this is a green field project, the Gadegaon Village (480 houses with 1700 population) is proposed to be rehabilitated and resettled. Hence, air quality standards of GSR 742 (E), 2000 are considered for core zone and buffer zone.
- 2 There is 1 location within core zone and 11 locations within buffer zone.
- 3 In core zone, the incremental PM10 concentration is 85.62 µg/m<sup>3</sup> without control measures and 47.30 µg/m<sup>3</sup> with control measures.

- 4 In buffer zone, the incremental PM10 concentration is ranging from 0.28  $\mu\text{g}/\text{m}^3$  to 59.35  $\mu\text{g}/\text{m}^3$  without control measures and from 0.07  $\mu\text{g}/\text{m}^3$  to 15.29  $\mu\text{g}/\text{m}^3$  with control measures.
- 5 The cumulative values of Baseline and predictive incremental values with control measures for PM2.5, NOx and SOx are found to be within permissible limit at all locations. The cumulative values of Baseline and predictive incremental values with control measures for PM10 are found to be within permissible limit at all locations except at Sonurli Village.
- 6 During prediction exercise, highest incremental PM10 concentration in buffer zone was observed at Sonurli Village ie 138.81  $\mu\text{g}/\text{m}^3$  without control and 96.29  $\mu\text{g}/\text{m}^3$  with control measures. This is attributed to the location of the village in crosswind (West) direction at 0.5 km distance from the proposed Gadegaon OC project.
- 7 During modeling it was found that most of the pollution load is due to the OB transportation by Road. Thus, air pollution mitigation measures for OB transportation will significantly reduce pollution load.

### 3.3 Water Quality

Four nos. of samples for Ground water, Two nos. of samples for drinking water every month (Thrice a season), Three nos. of surface water every month (Thrice a season), One nos. of STP discharge (Thrice a season) and One nos. of Mine water samples (Thrice a season) (Total – 36 samples) were collected as representative samples to assess water quality of the area during the study period.

These samples were analyzed as per IS:3025 and “Standard Method for the Examination of Water & Waste Water” published by American Public Health Association (APHA: 24<sup>th</sup> Edition, 2023).

Details of sampling location are given below:

#### Sampling Locations for Industrial Effluent

To assess the quality of waste water discharge, water samples were collected from the following locations:

Sr. No.	Name of Sampling Locations	Frequency	Location Code
1	Penganga Mine Discharge	Once in a season	BGMD1

### Sampling Locations for Surface Water

To assess the quality of surface water, water samples were collected from the following locations:

Sr. No.	Name of Sampling Locations	Frequency	Location Code
1.	Upstream Of Penganga River	Once in a season	BGSW1
2.	Downstream Of Penganga River	Once in a season	BGSW2
3.	Upstream Of Wardha River	Once in a season	BGSW3
4.	Downstream Of Wardha River	Once in a season	BGSW4
5.	Surface Water Of Nandgaon Village Pond	Once in a season	BGSW5

### Ground water sampling locations

To assess the quality of drinking water/ground water around the project area, the water samples were collected from the following locations around the project area:

Sr. No.	Name of Sampling Locations	Frequency	Location Code
1.	Chanakha Village	Once in a season	BGGW1
2.	Pimpri Village	Once in a season	BGGW2
3.	Antargaon Village	Once in a season	BGGW3
4.	Talodhi Village	Once in a season	BGGW4
5.	Hirapur Village	Once in a season	BGGW5
6.	Gadegaon Village	Once in a season	BGGW6

### Drinking water sampling locations

To assess the quality of drinking water around the project area, the water samples were collected from the following locations around the project area.

Sr. No.	Name of Sampling Locations	Frequency	Location Code
1.	Kailash Nagar Colony WCL	Once in a season	BGDW1
2.	Khairgaon Village	Once in a season	BGDW2

### 3.4 Hydrogeological Quality

The average water levels fluctuations measured from the area in and around in year 2024 for Gadegaon OC are given below.

#### Ground Water Levels

Pre monsoon (May 2024)	Core Zone	5.10 m bgl to 6.70 m bgl
	Buffer zone (area between 2 to 10 km radius)	4.20 m bgl to 11.00 m bgl
Post monsoon (Nov 24)	Core Zone	3.00 m bgl to 3.80 m bgl
	Buffer zone	2.30 m bgl to 5.70 m bgl

### 3.5 Noise Levels

Baseline noise levels at day time and night time are being generated at twelve locations. All noise levels values are found to be within the prescribed limits.

### 3.6 Land Use

Present Land use of the land required for Gadegaon OC mine is given below:

#### Present Land Use of the Land Required for Gadegaon OC

Sr. No.	Type Of Land	Total Land Proposed In This Mining Plan(Ha)
1)	Tenancy Land	574.71
2)	Govt. Land	40.85
3)	Forest Land	0.00
	<b>TOTAL</b>	<b>615.56</b>

Note: No forest land is involved in the project

The land use of the project during mining is as follows:

**Land Use Pattern**

S. No.	Land use category	(1 <sup>st</sup> year)	(5th year)	(10th year)	(15th year)	End of Mine (21 <sup>st</sup> year)	Post Mining
1	Backfilled Area upto GL	0.00	0.00	0.00	35.00	72.00	215.00
	(Reclaimed with plantation)	0	0	0.00	0	20.00	215.00
2	Excavated Area (Not reclaimed)/void	0.00	82.00	190.00	260.00	328.00	185.00
3	External OB dump	0.00	0	0	0	0	0
	(Reclaimed with plantation)	0.00	0	0	0	0	0
4	Top Soil Dump	0.00	31.00	68.00	0	0	0
	(Reclaimed with plantation)	0.00	0	0	0	0	0
5	Infrastructure & Roads	0.00	30.00	30.00	30.00	30.00	30.00
	(Brought under plantation)	0.00	0	5.00	5.00	5.00	5.00
6	Embankment	0.00	64.00	64.00	64.00	64.00	64.00
	(avenue plantation)	0.00	0	0	0	0	0
7	Nala Diversion	0.00	5.00	5.00	5.00	5.00	5.00
8	Blasting Zone/Rationalization Area)	615.56	403.56	258.56	221.56	116.56	116.56
	(Plantation)	0.00	15.00	40.00	60.00	65.00	116.56
	<b>Total</b>	<b>615.56</b>	<b>615.56</b>	<b>615.56</b>	<b>615.56</b>	<b>615.56</b>	<b>615.56</b>
	<b>Total (Plantation)</b>	<b>0.00</b>	<b>15.00</b>	<b>45.00</b>	<b>65.00</b>	<b>90.00</b>	<b>336.56</b>

The land use at the end of the mine would be as follows:-

**Land Use at the End of the Mine**

S.No.	Land use Pattern	Land use (ha)				
		Plantation	Water Body	Public use /Company use	Undisturbed	Total
1	External OB Dump	0	0	0	0	0
3	Excavation	215.00	185.00	0	0	400.00
4	Embankment	0	0	64.000	0	64.00
5	Infrastructure & Roads	5.000	0.00	20.000	5.00	30.00

6	Nala Diversion	0.000	5.00	0.000	0	5.00
7	Blasting Zone/Rationalization Area)	116.56	0	0	0	116.56
	Total	336.56	190.00	84.000	5.000	615.56

### 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. The social infrastructure will be developed under the CSR and CER. Total Rs . 662.85 lakhs will be spent on the Corporate Environment Responsibility.

### 4.0 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.

#### 4.1 Air Quality

Prediction of fugitive dust level in the surrounding is carried out (for 24 hours average) with the help of by using AERMOD version 11.2.0 Air Quality Model.

#### **Air Pollution Control Measures**

In order to mitigate the adverse impacts on ambient air, the following main control measures are being taken and will also be taken during expansion of 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, SO<sub>2</sub>, NO<sub>x</sub>, 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.

i ) Coal face will be blanketed by overburden material to prevent fire in exposed coal galleries.

Capital and revenue provision for control measures

Sr. No.	Particular	Proposed Mitigation measure	Capital cost (approx. in lakhs)	Recurring cost/annum (approx. in lakhs)
1	Trolley mounted Mist Cannon 100m radial throw	10 Nos. will be installed at Coal & OB transport route	100	10
2	Truck mounted mist cannon	1 nos. will be deployed at Coal and OB transport route on hiring basis.	-	40
3	Road sweeping machine	Deployment of road sweeping machine	58.01	0
4	Rainguns	15 Nos. rainguns to be installed at haul road, CHP, weighnridge and coal stockyard with radial throw 30 m	75	10
5	Mobile water sprinklers along haul road, CHP and other dust generating source	2 Nos. 28 KL water tanker with mist spray arrangement to be deployed at haul road and coal transportation route of mine. 2 Nos. 12 KL water tanker will be deployed on hiring basis at coal transportation route. Additionally 4 nos. of 12 KL water taker will be deployed on contractual basis.	587.72	40
6	Construction of CC and Bitumen road	For transportation of coal 3.00 Km concrete road is proposed	-	-
7	Drill machine with dust extraction method	Drill machine with dust extraction method is proposed on hiring basis	-	-
8	Wind barrier	Wind barrier system will be installed OB transport route	200	-

9	Plantation	Total plantation will be done in 336.56 ha area comprising of green belt along the mine boundary in avg 7.5 m width	100	100
10	CAAQMS	One number CAAQMS is proposed at downwind side of mine. Location will be confirmed in consultation with Maharashtra Pollution Control Board.	100	-
11	Sedimentation tank	Sedimentation tank will be constructed for treatment of mine water	100	10
12	Effluent treatment plant	Effluent treatment plant of capacity 100 KLD will be constructed at Workshop for treatment of wastewater generated from washing of HEMM	75	10
13	Sewage treatment plant	Modular STP will be installed once office building will be constructed	100	10
14	Tyre washing system	Installation of automatic Tyre washing system at mine exit point	90	-
<b>TOTAL</b>			<b>1585.73</b>	<b>230</b>

### **Plantation to Check Air Pollution**

Plantation will be under taken in the mine area as mitigating 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. A total of 2500 plants/ha are proposed as plantation density.

It can be observed that out of 615.56 ha land, 336.56 Ha is proposed as plantation in post mining scenario and 53 ha of grassing, which is 63.28 % of the total project area.

Experimentally, it has been observed that some plant species have good efficiency in removing particulate matter. Central Pollution Control Board has recommended few plant species, which are very efficient for dust control.

## **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 on 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.

Major impact on water quality associated with coal mines is acid mine discharge. However, no acid mine discharge has been observed in the nearby mine Penganga OC mine (6.3 MTPA) which has been operating since June 2015. Gadegaon OC is a greenfield opencast mine, where regular monitoring of water quality shall be carried out as per conditions laid down in the Environment Clearance. Regular monitoring of mine discharge ensures that only treated clean water from the sedimentation tank, meeting prescribed standards, is released.

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

### **Industrial Effluent**

The waste-water from workshop, which normally remains laden with oil and grease, suspended and dissolved solids etc. will be treated in the Effluent Treatment Plant (ETP). The wastewater will be generated due to washing of HEMM. A 100 KLD Effluent Treatment plant is proposed to be installed at Gadegaon OC mine. Clear water coming out from the treatment plant will be taken into the closed water circuit and recycled for its reuse. The ETP will be equipped with Oil skimmer, Sedimentation tank, Rapid mixer and Clarifloculator. ETP sludge will be sent to Waste Collection, Treatment, Storage & Disposal Facilities (CHWTSDF) at Butibori and no effluent will be discharged in the local water streams.

All parameters of ETP waste discharge shall be monitored regularly as per Environment (Protection) Amendment Rule, 2000. The proposed ETP of 100 KLD will be sufficient for treatment of effluent generated from workshop. Capital budget of Rs . 75.00 Lakhs is provided for the same.

### **Mine Water**

Most of the suspended particles will be settled in the sump located in the quarry and the supernatant water will be pumped out to the sedimentation tank. This water will be treated through sedimentation pond on surface, before being reused or discharged in to river. A sedimentation tank of appropriate dimensions based on quantum of mine water discharge will be provided in Gadegaon OC mine. Capital budget of Rs . 100.00 Lakhs is provided for the same.

### **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. The vegetation reduces surface run-off, which helps avert siltation of natural water courses. Garland drains and catch drains will be constructed and maintained to arrest silt and sediment flows from the soil, OB and mineral dumps.

Adequate protective measures will be taken at the toe of the dump for checking run-off and siltation through construction of garland drains around the periphery of the existing dump. These drains will be cleaned and desilted before the onset of every monsoon. Further, drains will be constructed as per requirement as the mine advances.

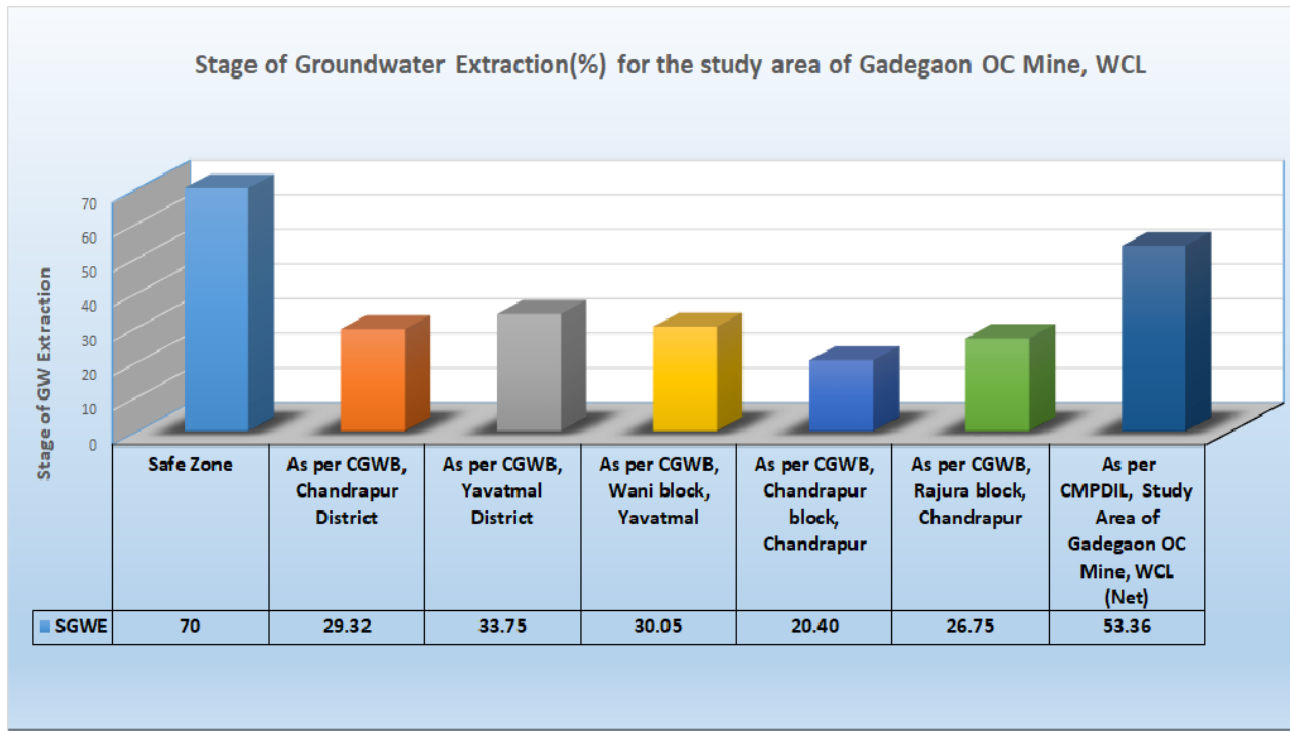
### **Sewage Water**

The treatment of sewage generated from the households is necessary to keep the nearby water bodies clean. The manpower of Gadegaon Project will be accommodated in Kailash nagar colony of located within mining lease area of Mungoli. Nirguda Extension Deep OC where STP already exists. At the township, 400 KLD sewage treatment plant has been provided which will be sufficient to cater the requirements of this mine. However, capital budget of Rs. 100.00 Lakhs is provided for this.

### **Impact on Hydro-Geological Regime**

Coal mining is the major industrial development activity in the area. The Central Ground Water Board has reported in the 'INDIA- Groundwater Resource Estimation System (IN-GRES) ' web portal for the Assessment year 2024-25, that the stage of Groundwater extraction in the Rajura Block, Chandrapur district (where the Gadegaon OC is located) is 26.75% and hence the region lies within the "Safe" category. The overall stage of groundwater extraction in Chandrapur district was reported as 29.32% and falls under the "Safe" category. Stage of groundwater extraction for the study area of the project area has also been determined as about

53.36 %, which is also under the 'safe' category. These have been represented in Figure below:



Stage of Ground Water Extraction in the study area.

### **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 recover and attain normalcy. Thus, the impact of mining on groundwater system may be considered as a temporary phenomenon. The old mine workings also work 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 control measures will be adopted by the project authorities.

### 4.3 Noise Quality

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.

### 4.4 Impact on Land and Land Reclamation

The total land required for the mining & infrastructures etc. of proposed Gadegaon OC Project is 615.56 Ha. The major land degradation may be as a result of quarry excavation, overburden dumping, civil construction, approach roads etc. Land use pattern of Gadegaon OCP will be changed during mining operations. Internal back-filled dumps and external dumps formed temporarily during coal extraction. Depth of quarry will go up to 220 m, which may also affect the adjoining land and water courses due to erosion of loose strata in dumps.

The land degradation in the Gadegaon OC Project has been kept at a minimum. The mine has been planned in such a way that it ensures not only the conservation of coal but also conservation of precious land resource. No land has been envisaged for external dumping in this mine. The de-coaled void of existing Penganga OCM will be utilized for part of OB dumping from proposed Gadegaon OC mine. Also, the part of OB generated will be backfilled in the de-coaled area as internal dump and reclaimed technically and biologically. The land required for this mine is only for quarry and safety zone. The land requirement details of Gadegaon OC project is as shown below:

**Land Use Table**

Details of additional Land	As per Revised Mining Plan December, 2024 (Ha)
Tenancy land	574.71
Govt. land	40.85
Forest land	0.00
<b>Total Land</b>	<b>615.56</b>

The land use in core zone is mainly agricultural land. So the major impact on land will be degradation of agriculture land in the mining area.

The following activities have been proposed for reclamation of land.

1. Creation of garland drains in order to arrest the silt load, due to erosion, to enter into natural watercourses during surface run-off.
2. 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.
3. 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.

#### **4.5 Rehabilitation & Resettlement**

Gadegaon village located within ML area is proposed to be rehabilitated. The project involves 480 projects displaced households and 1700 project affected population. These families will be shifted/rehabilitated as per Rehabilitation and Resettlement Policy of Coal India Limited, 2012.

Rehabilitation complex of WCL, is so planned that it constitutes part of the existing village environment, so that while enjoying all the civic facilities provided in the rehabilitation complex developed by WCL, the families continue to be in a rural matrix. Other amenities that will be provided in the rehabilitation complex are Shopping Centre, Hand Pumps, Open Dug Wells, Primary School, Dispensary, Panchayat Bhawan, Flour Mill, etc.

In addition to above piped water supply system, WBM road, Murom road, children's park, playground, street lighting, plantation along road side and open space will be provided .

As regards their means of earning livelihood, the families who have lost their homestead, land holdings only they will continue to do their existing vocation from the rehabilitation site. In their case the company has only asked them to shift from the present place of living to the new place which will not be far away from the existing residential locations. In fact, in rehabilitation complex, they will be provided with civic amenities which they may not have in their original village.

#### **4.6 Progressive Mine Closure Plan**

For the Mine Closure activities, a corpus fund will be created by opening an escrow account with the coal controller organization in nationalized bank. For opencast mine, an amount @ Rs 9.00 lakhs per Ha of the project area will be required to be deposited in this escrow account for final mine closure after adjustment for WPI on the date of

computation. This amount will be deposited in the escrow account every year after escalating @ 5% per annum.

Mining operation will affect the families and land owners in the mine taking area directly. The project affected persons and families will be shifted to the rehabilitation sites during pre-mining stage and active mining stage. These sites have lots of provisions with respect to infrastructural facilities like roads, schools, parks, community hall, Panchayat Bhavan, water supply arrangements. These provisions will benefit the other villages after rehabilitation and resettlements.

The final mine closure plan will be prepared before three years of final closure and its approval will be obtained from WCL board. The final mine closure plan will include all the measures to minimize the impact of post closure of the mine in the study area.

## **5.0 ENVIRONMENTAL MONITORING PROGRAMME**

The Environmental Monitoring Program will be carried out as per statutory requirements and detailed in the chapter – 6 of the EIA report.

### **Additional Studies**

**Public Consultation:** Public consultation will be arranged by Maharashtra Pollution Control Board after submission of this Draft EIA-EMP Report along with EIA Summary of the Project (Public Hearing document) based on the ToR issued by MoEF&CC .

**Risk Assessment and Management:** The disaster management is essential to Guard against and mitigate the consequences of major accidents. Keeping in view the three basic principles ie prevention, preparedness (both proactive and reactive) and mitigation of effect through rescue, recovery, relief and rehabilitation; a comprehensive blue print of disaster management plan as Mine Emergency Response Plan (MERP) has been prepared for Gadegaon OC incorporating the Identification and assessment of risks and recommendation of measures to prevent damage to life and property against such risks.

**Traffic study:** The coal from in-pit to surface is proposed to be transported through dumpers, from surface to railway siding through conveyor belt and by railway to the final consumers. The conveyor belt along with the Silo loading system is proposed to be completed by March'2029. Till the time conveyor is commissioned, the coal from mine to railway siding will be transported through tarpaulin covered trucks. The

transportation of coal will be entirely within the lease area of WCL mines. This is a green field project and hence the number of trucks could not be counted. However, the following precautions will be followed for the transport of coal.

- Vehicles carrying coal will be covered with tarpaulin to prevent spillage.
- Sufficient free over board should be left in the trucks carrying coal to rule out the spill over.
- Vehicles carrying coal will be meeting all air pollution control norms and at regular interval checks for the implementation of pollution under control (PUC) certificates.
- Additional road safety precaution like traffic police outpost, traffic signals, illumination, traffic signs will be provided at the intersection of roads.

### **Action plan towards Sustainable Development Goals (SDG).**

WCL and Gadegaon project are committed towards aligning its activities towards following Sustainable Development Goals SDGs:

**Goal No. 8 :**        **Promote sustained, inclusive and *sustainable economic growth* , full and productive employment and *decent work* for all**

WCL Gadegaon mine is achieving this aim through its following activities:-

- a) Encouraging participation from micro-, small- and medium sized enterprises in procurement and service-related tenders through Government e-marketplace ( GeM ).
- b) Generation of indirect employment as well as entrepreneurship through ancillary support.

**Goal No. 9 :**        **Build resilient *infrastructure* , promote inclusive and sustainable *industrialization* and foster *innovation***

WCL Gadegaon mine is aiming to achieve this aim by adoption of technological capabilities such as:-

- a) Use of Surface Miner Technology for coal extraction which eliminates drilling & blasting in coal face.
- b) Use of Silo and belt conveyor loading thereby eliminating road transport

In addition to the above, WCL, the parent company of Gadegaon Mine, as a corporate entity endeavors to play its role in achieving other SDG Goals details of which are given in Annexure-18.

### **Carbon Absorption Plan:**

Green house emission gases from mine operation & other allied activities were evaluated. The total GHG emissions estimated to be generated over the life of the project is 4.76 million tonnes of CO<sub>2e</sub>. To offset the emissions reclamation plantation in an area of 336.56 ha, is proposed to be done over the mine life period. Also a 20 KW solar power plant is proposed to be installed. The total offset emissions are estimated to be 0.54 million tonnes of CO<sub>2e</sub>.

Hence the net emission of GHG from the project would be 4.23 million tonnes of CO<sub>2e</sub>.

The carbon emission intensity due to the project can be further reduced by undertaking the following measures:

- Supplementary installation of higher capacity solar power generation plant will help to further reduce the emission intensity of the project – the annual CO<sub>2</sub> offset potential is estimated @ 1351.14 tonnes CO<sub>2e</sub> per MW solar power capacity installed. Same may also be planned as a part of post mining repurposing phase subject to site feasibility and techno-economic viability.
- Initiatives undertaking plantation / social forestry outside project boundary.

### **Plan for reduction of specific diesel consumption:**

A study for estimating the specific diesel consumption was carried out by CMPDI (attached as Annexure-9).

As per the study report the Specific Diesel Consumption (SDC) for the year of commencement of the mine will be 0.40 L/t.

Steps to reduce the SDC have been suggested in the report and it has been projected that the SDC will gradually reduce to 0.34 L/t during the mine life.

### **Project Benefits**

The expansion of Gadegaon OC will further enhance the socio-economic activities in the adjoining areas. This will result in improvements in Physical Infrastructure, improvements in Social Infrastructure, increase in Employment Potential, contribution to the Exchequer, Post-mining Enhancement of Green Cover

Overall, there will be positive impact in socio-economic area due to increased economic activities, creation of new employment opportunities, infra-structural development, better educational and health facilities.

There will be creation of additional direct and indirect employment opportunities due to expansion of this mine. Also, WCL undertakes skill development & capacity building

program like vocational training, income generation and entrepreneurship development. Same will be continued for expansion Project.

Other Tangible Benefits: Western Coalfields Limited is facing increasing demand of power grade coal. Continuing and augmentation of coal production from the mines of WCL will help to bridge the gap of demand and supply of power grade coal in India.

### **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 ie the Project level. Nodal Officer (Environment) of the area monitors all aspects of environment on behalf of the Area General Manager. He takes suitable steps for generation of environmental data along with CMPDI team for its analysis and interpretations.

### **6.0 ENVIRONMENTAL COST PROJECTION**

A capital provision of Rs. 1585.73 lakhs has been made against environment protection and Rs . 6.00/t of coal has been provided to absorb environmental related cost in the project.

### **7.0 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 immediately preceding financial years or Rs 2.00 per Tonne of Coal Production of the previous year whichever is higher.

### **Environment Management Plan**

The success of environmental management in an organization not only depends on Deep involvement of its personnel at all levels but also on the creation of an effective implementing organizational structure.

**Implementing Organization:** Western Coalfields Limited, the owner of this project has a well-established organization at Corporate as well as Project level.

**Corporate Level:** Western Coalfields Limited, the owner of this project has an Environmental Department headed by a General Manager at its HQ. The department provides necessary support that is required for Environmental Management of various projects and mines under the jurisdiction of the company. Furthermore, to carry out

Rehabilitation & Resettlement measures, a Land & Revenue Department has been working at W CL HQs which is also headed by a General Manager.

**Project Level:** The environmental activities of the Project are carried out by Environmental Cell at Project level headed by a Sub Area Manager, under the overall control of the Area General Manager of the project.

**Environmental Monitoring and Control:** For effective implementation and mid-term corrective measures (if required) monitoring and control of program implementation is essential. For this purpose, a time bound action program for environmental management has been prepared.

The scope of environmental management includes plantation, surface drainage, industrial complex, water treatment plant, ambient air, water including ground water and noise pollution monitoring and implementation of control measures etc.

## **8.0 CONCLUSION**

The mining sequence has been planned in a way to maximize 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 minimize the impact on environment.

Gadegaon OC may be granted environmental clearance so that the project can bridge the gap between demand and supply of coal in the country and help in achieving the self-reliance on coal production within the nation.