EXECUTIVE SUMMARY

ENVIRONMENTAL IMPACT ASSESSMENT

&

ENVIRONMENTAL MANAGEMENT PLAN

FOR

Conducting Public Hearing as per EIA Notification, 2006

BHATADI EXPANSION OCP(2.0MTPA)

(Chandrapur Area, WCL)

For

Enhancement in production capacity from 1.465 MTPA to 2.00 MTPA and increase in project area from 847.37 Ha to 1423.75 Ha

(PREPARED AS PER TOR J-11015/151/2014-IA.II(M) dated 02.06.2021)

October - 2023

Prepared by

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

(Accredited vide letter no. NABET/EIA/2124/RA 0258 valid till 22.08.2024)

CMPDI/EIA/PH/01/WCL/2023-24/OCT/136/00

Contents

EXECUTIVE SUMMARY OF EIA/EMP FOR BHATADI EXPANION OCP (2.0 MTPA)

1 INTRODUCTION

The proposed Bhatadi Expansion OCP (2.0 MTPA) is a brown field project. Considering the potential of Bhatadi Expansion OC mine for further expansion for enhanced production and to meet the coal supply demands of M/s MAHAGENCO, project proponent Western Coalfields Limited (WCL) has planned for further expansion of the mine from the current capacity of 1.465 MTPA to 2.0 MTPA in Bhatadi OC geological block and adjacent Bhatadi NW geological block as per approved Revised Project Report with increased land area from 847.37 ha to 1423.75 ha.

2 DESCRIPTION OF PROJECT

The Bhatadi project area can be approached from Nagpur-Chandrapur road upto Tirwanja village. The distance by this road is about 10 km upto Tirwanja village. At present this is an all-weather approach to Bhatadi OC. The project site can also be approached from Chandrapur town via Chandrapur-Tadoba road for part of the way. The nearest rail head is Tadali and Chandrapur Station is about 15 km from the project area. The proposed area is drained by Erai river and its tributaries. The general elevation of the area varies between 184m and 212m from mean sea level with slope towards South-East. The climate of the area is tropical with maximum temperature of 49^0C recorded during summer and minimum temperature of 8^0C during winter. The average rainfall is 1350 mm. The project falls in Seismic Zone-IV. The grade of considered for the project is G9 (4657 kCal/Kg).

The project is mainly linked to Chandrapur Super Thermal Power Station, Chandrapur owned by Maharashtra State Power Generation Company (M/s MAHAGENCO). It is envisaged to dispatch coal from the proposed project by means of existing fully operational pipe conveyor system (6.25 km length) installed by M/s MAHAGENCO from Bhatadi OC mine to Padmapur Wagon loading station of CSTPS, Chandrapur.

Sl. No	Description	Units	Details
A.	**GENERAL**		
1.	Name of Project	-	Bhatadi Expansion OC (2.0 MTPA)
2.	Name of Company	-	Western Coalfields Limited
3.	Registered address	-	Western Coalfields Limited, Coal Estate, Civil Lines, Nagpur – 440001
4.	Location	-	About 15 km NNW of Chandrapur, Maharashtra
5.	Plot/Survey/Khasra No.	-	Latitudes : N 20°02'24" to 20°05'08" Longitudes : E 79°15'05" to 79°17'49" It is covered by Survey of India Topo Sheet No. 55 P/4 (IAC Series) F44T8 (OSM Series). Project is bounded by above latitude and longitudes.
6.	Village	-	Bhatadi Village, Paili Village
7.	Tehsil	-	Chandrapur
8.	District	-	Chandrapur
9.	State	-	Maharashtra
10.	Maximum Elevation above MSL	-	212m
11.	Highest Flood level from the Project Boundary	-	The general elevation of the area varies between 184m and 212m from mean sea level with slope towards South-East. The HFL of Erai river, which flows from North to South at the Eastern end of the Bhatadi block is 189m (1994)..
12.	Seismic Zone	-	Zone 4
13	Nearest Railway Station		Tadali Railway Station about 9 kms from mine
14	Nearest Airport		Nagpur Airport -155km (Approx..ariea)
15.	Nearest Town		Chandrapur City- 15 km (Approx..)
16.	National/State Highway		National Highway-NH 930 State Highway- SH 6

17.	Village Panchayats, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given).	-	Village Panchyat – Bhatadi Village Tehsil –Chandrapur Dt. Chandrapur, Maharashtra State
18.	Ecological sensitivity of the project or activity -Wild life sanctuary	-	The ESZ of the Tadoba Andheri Tiger Reserve is located 3pprox.. 0.75 kms from the project in the North East. Core Zone of the TATR is situated at 11.50 Km in North East Direction
19.	Brief description of project, Size, category of the project	-	Capacity of Mine- 2.0 MTPA, Land Area- 1423.75 ha, Category – A
20	Type of the proposal	-	Expansion Project
B.	GEOLOGICAL		
1.	Name of geological blocks considered	Name	Bhatadi OC geological block and adjacent Bhatadi NW geological block
2.	Geological Reserve:		
	i. Total geological reserve	Mt	58.87 Mt
	ii. Mineable reserve	Mt	55.93 Mt
	iii. Extractable reserve	Mt	45.53 Mt
	iv. Per cent (%) of extraction		77.3% (Extractable Reserves/Total Geological Reserves)
	v. Range of ground water level	m	Core Zone: Pre monsoon: 3.20m to 8.90m Post monsoon: 1.95m to 6.05m Buffer Zone: Pre monsoon: 3.00m to 13.70m Post monsoon: 0.55m to 12.55m

<table>
<tr><td></td><td>vi. No. of Seams & Generalized thickness range</td><td></td><td>One composite seam with multiple sub sections. Generalized thickness range 14.00 to 19.00 m.</td></tr>
<tr><td></td><td>vii. Grade of Coal</td><td></td><td>G9 (4657 kCal/Kg)</td></tr>
<tr><td>C</td><td colspan="3">TECHNICAL</td></tr>
<tr><td>i</td><td>Area of the proposed mine boundary</td><td>ha</td><td>The total land involved in proposed Bhatadi Exp. OC mine is 1423.75 ha, out of which 837.94 ha land is already acquired. Additional land to be acquired is 585.81 ha including 0.20 Ha of forest land.
<table>
<tr><th>Sl. No.</th><th>Land Type</th><th>Land already acquired in Bhatadi Exp. OC mine (1.465 MTPA)</th><th>Additional Land acquisition proposed in BhatadiExpn. OC mine (2.00 MTPA)</th><th>Total Land (ha)</th></tr>
<tr><td>1</td><td>Tenancy Land</td><td>785.69</td><td>560.59</td><td>1346.28</td></tr>
<tr><td>2</td><td>Govt. Land</td><td>52.25</td><td>5.02</td><td>57.27</td></tr>
<tr><td>3</td><td>Forest Land</td><td>-</td><td>0.20</td><td>0.20</td></tr>
<tr><td></td><td>Sub-Total</td><td>837.94</td><td>565.81</td><td>1403.75</td></tr>
<tr><td></td><td>Outside Mine Boundary (For village rehabilitation)</td><td>-</td><td>20.00</td><td>20.00</td></tr>
<tr><td></td><td>Total</td><td>837.94</td><td>585.81</td><td>1423.75</td></tr>
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ii Post Mining Land Use

Post-Mining Land-use Plan

Sr. No.	Land use during mining	Land use (ha)				
		Plantation	Water Body	Public Use	Undist-urbed	Total
1	External OB dump	271.64	0.00	0.00	0.00	271.64
2	Excavation	298	212.63	0.00	0.00	510.63
3	Embankment & Road	10.00	0.00	20.00	0.00	30.00
4	Colony, Infrastructure etc.	10.00	0.00	60.00	0.00	70.00
5	Miscellaneous (300m blasting zone, river diversion, power line diversion & rationalization	393.86	0.00	0.00	127.62	521.48
6	Land for Village Rehabilitation	0.00	0.00	20.00	0.00	20.00
Total		983.50	212.63	100.00	127.62	1423.75

iii Method of Mining: Opencast with Shovel – Dumper Combination

iv Life of Mine: 25 years

v Manpower: 563 Nos.

vi Details of External Dumps

No. of Dumps	Four
Area	271.64 ha
Height	90 m
Quantity	External Dump – 181.58 Mm3 (Excluding Dump D)
Year of Backfilling	10th Year from the start of mining.

vii	Details of Internal Dumps		No. of Internal Dumps	Two
			Area	298.00 Ha
			Height	Upto ground level
			Quantity	217.74 Mm^3
viii	Details of Final Mine Void		Area	212.63 Ha
			Depth	220 m(Maximum)

3 DESCRIPTION OF THE ENVIRONMENT

To assess the impact of mining operation on different components of environment of proposed Bhatadi Expansion Project (2.0MTPA), baseline data generated including Meteorological data, Air quality, Water quality, Noise quality, Soil quality, Flora & Fauna survey & Socio-economic study was carried out during 16.03.2023 to 15.06.2023 for the proposed mine. As per specific ToR condition one-month additional baseline data has been generated in October'2021 for the proposed mine. The present environmental status of the different monitored parameters is discussed briefly.

Micro-Meteorological Scenario

Sl. No.	Parameter	Details
1.	Wind Direction	North West
2.	Wind Speed (kmph)	Min – 0.0 Max – 20.0 Average – 1.42
3.	Rainfall (mm)	Min – 0.0 Max – 0.8 Total – 31.25
4.	Air Temperature **(°C)**	Min – 20.9 Max – 49.4 Average – 35.8
5.	Relative Humidity	Min – 0.0 Max – 76.2 Average – 28.2

3.1 Air Environment

Air pollution parameters like Particulate Matter (PM_{10}), Particulate Matter ($PM_{2.5}$), Sulphur Dioxide (SO_2), and Nitrogen Dioxide (NO_2) and heavy metals representing the basic air quality in the region was identified as related to the project activities for representing baseline status of ambient air quality within the study area. Baseline air environment was studied by monitoring air quality at 10 stations (2 core and 8 buffer) within 10km of project area during pre-monsoon season (From 16.03.2023 to 15.06.2023). The 98 percentile values monitored are given below: -

Sl. No.	Location Name	PM_{10}		$PM_{2.5}$		NOx		SO_2	
		98 %le	Stds.	98 %le	Stds.	98 %le	Stds.	98 %le	Stds.
1	Vadoli village	73.5	100	35	60	12	80	<10	80

2	Kitadi village	85	100	40	60	12.5	80	<10	80
3	Chak Tirwanja village	85	100	40	60	12.5	80	<10	80
4	Durgapur Colony	90	100	43.5	60	12	80	<10	80
5	Chinchala village	80	100	40	60	13	80	<10	80
6	Moksa Tirwanja village	80	100	40	60	12	80	<10	80
7	Urjagram	75	100	35	60	12	80	<10	80
8	Chandrapur city	95	100	50	60	14.5	80	<10	80
9	Bhatadi village	90	100	43.5	60	12	80	<10	80
10	Bhatadi Manager office	259	300	55.5	-	18	120	15	120

The baseline ambient air quality data monitored during the above mentioned studies for the Core & Buffer zone for all parameters of pollutants including heavy metals are found to be well within the acceptance limit.

3.2 Water Environment

The baseline data for water quality assessment of samples was taken during 16.03.2023 to 15.06.2023 assessing various characteristics of water during the baseline data generation of proposed project. A total of 7 nos samples were taken i.e. 2 nos. for Drinking water, 1 nos. for Mine water and 1 nos. for ETP Effluent (Treated Water) of Bhatadi Expn. OC and 2 nos. for surface water from Erai River and 1 no. from Erai Dam. Baseline study has been carried out during Oct'21. All the water samples were analysed as per standard method prescribed in APHA (23rd Edition) and compared with CPCB Standard and drinking water quality standard (IS: 10500, 2012).

It is observed that all the analysed parameters are well within the prescribed limits.

3.3 Hydrogeology

To monitor the impact of mining on ground water levels in the study area, WCL has established a monitoring network with 26 hydrograph stations spread over the buffer zone. Water level monitoring in these hydrograph stations has been done as per MoEF & CC guidelines (four times in a year).

The range of water levels (2018), measured from the core and buffer zone of Bhatadi Expn. OC are given below:

Core Zone:

Pre monsoon: 3.20m to 8.90m

Post monsoon: 1.95m to 6.05m

Buffer Zone:

Pre monsoon: 3.00m to 13.70m

Post monsoon: 0.55m to 12.55m.

3.4 Noise Environment

The monitoring of noise levels were done at ten locations, considering the population and traffic in the area during 16.03.2023 to 15.06.2023.

Analysis of noise levels has revealed that there is no noticeable impact of noise in the surrounding environment. The Leq noise level during both day time and night time were well within the corresponding threshold limit value, as prescribed by CPCB, at all the sampling locations.

3.5 Soil Environment

Present soil quality of the area has been evaluated with respect to its physico-chemical properties viz. texture, bulk density, moisture content, water holding capacity, pH, EC, Organic Carbon and Nutrients, which are important for plant growth and agricultural productivity.

3.6 Ecological Resources

3.6.1 Floral Diversity

The study area comes under Tropical Dry Deciduous forests. Villagers grow staple food crops, commercial crops and vegetable crops.

Buffer zone has predominant Gardenia gummifera L.f., Lagerstroemia parviflora Roxb., Holarrhena antidysenterica (L.) Wall. ex A. DC., Butea monosperma (Lam.) Taub., Diospyros melanoxylon Roxb., Ehretia laevis (Rottler ex G. Don) Roxb. , Madhuca longifolia var. latifolia (Roxb.) A.Chev., Pongamia pinnata (L.) Pierre with vegetables and commercial crops.

Also, geological formations, dunes, beaches, coral reefs, and mangroves are not present within the study area. No prominent grass land ecosystem was found in the study area. The aquatic flora of the survey area is of common type and there are no rare and endangered species found in the core and buffer zone.

The biodiversity assessment of core and buffer zone is carried out through quadrate method. The biodiversity in core zone is 0.88. Biodiversity in buffer zone is 0.93.

3.6.2 Fauna diversity

Faunal diversity is very negligible in the core zone as the habitat conditions are not suitable for the distribution of wildlife fauna. It is further observed that endangered species are not present in the Core Zone of study area. Buffer zone has good faunal diversity due to the presence of Tadoba – Andhari national reserve forest. The aquatic habitats consist of River, Nala, Ponds; Ditches and water-logged areas represented by fin-fish (fishes) of seasonal varieties.

3.7 Socio-economic Environment

The study area falls under Chandrapur Tahsil of Chandrapur district. The villages present within 10 Km. area around the periphery of the proposed Bhatadi Expansion OC Project (2.0 MTPA) were surveyed during June - 2023 .

Socio-economic study reveals that most of the families in this zone are getting benefits directly or indirectly from the mining industry. Overall the quality of life is average. No significant changes have been visualized in the traditional way of life and occupation of the local people in coal mining areas. The local people are rather benefited due to the provision of more infrastructure facilities provided by the project.

The project will have on the whole a positive impact on socio-economic profile of the area due to increase in employment opportunities, trade and business, community development, improved communication link etc.

4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential impacts of proposed Bhatadi Expansion OC (2.00 MTPA) and its mitigation measures have been summarily discussed below.

4.1 Air Quality:

As per the ToR issued by MoEF&CC, AQIP study of Bhatadi Expansion OC (2.0 MTPA) has been considered in the 10KM radius. The increase in concentration of PM_{10}, $PM_{2.5}$, NOx & SO_2 due to proposed expansion of coal mining project have been worked out by using AERMOD (Version 9.4) software. The Ground Level Concentration (GLC) values have been found to be within prescribed standard limit at all baseline stations for increased production.

4.1.1 Impact due to Air Pollution and its Management

In order to mitigate the adverse impacts on ambient air, following main control measures are currently in practices for the existing project and the same measures shall be continued for the proposed expansion project: -

- Water spraying on haul road is being carried out by 04 no of mobile water sprinklers of 28 KL capacity and 01 nos. trolley mounted Mist Fogger.
- One number mechanical road sweeping machine is provided for the project.
- 50 Nos. of fixed sprinklers have been installed along the CHP, Coal Stock yard, Weighbridge. Also, 30 no. rain guns are provided along Coal Stock Yard & 3 no high efficiency rain guns provided in CHP area.
- Enclosures on coal transfer points and clearing off coal dust heaps on surface have been provided.
- Green belt will be developed around the mine premises and also along the roadside to arrest airborne dust movement.
- Vehicular emission of particulates, SO_2, NOx, hydrocarbons shall be minimized by proper training and maintenance of vehicles and other oil - operated equipment.
- Controlled Drilling and Blasting will be adopted for the project.
- Transportation of Coal from the proposed project to end user will be done by means of existing fully functional 6.25 km long Pipe Conveyor System for transportation of Coal from Bhatadi Expansion Mine to Padmapur MGR (Merry Go Round) of CSSTPP, Chandrapur. Coal transportation for the proposed project will be done by pipe conveyor system and no road transportation is envisaged.

Plantation to Check Air Pollution:

Plantation will be under taken in the mine area as control 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. As on date, 2,42,175 nos. plant saplings have been planted in a total area of 80.27 ha. Out of the 1423.75 ha proposed project area, 983.50 ha area (69.09% of total area) will be reclaimed biologically (including plantation in other areas) during the mine life of the proposed project.

4.2 Water Quality:

4.2.1 Impact due to Water Pollution and its Management

Effect of existing coal mining project is found to be within acceptable limit.

4.2.2 Mitigation measures for impact on water

- Surface runoff from quarry area, overburden dump will be collected in garland drains at the toe of dumps. After sedimentation in a settling pond, runoff will be discharged. The input of eroded material in surface water sources will be controlled by construction of walls, silt traps, raising plantations, covering with grasses, etc.
- Garland drains will be provided around the periphery of the quarry, and will be connected to the local water body after treatment.
- Workshop effluents which may contain coal dust, oil & grease, needs proper treatment. For treatment of workshop effluent respectively a fully functional 75 KLD Effluent Treatment plant has been commissioned at Bhatadi Expansion OCP. Provision has been made for upgradation of ETP plant for the proposed expansion project. The sedimentation pond of 19.20m X 4.50m (2 Nos.) is provided along the CHP for treatment of discharge from CHP. For mine discharge water, 2 Nos of Settling tanks of dimension 25.0 m x 9.0 m x 2.5 m and 25.0 m x 12.0 m x 2.5 m are in operation. Further, 2 Nos additional sedimentation pond of 9.0m X 6.0m X 3.0m are proposed to meet the increased production requirements.
- De-siltation of the constructed surface drains shall be done regularly to maintain its retaining capacity.
- The treated mine water is reused for water sprinkling on OB dump and haul roads for the existing project and the same will be continued for the proposed project.
- Domestic waste water generated from the colony is treated in existing 50 KLD STP plant. Additional STP facilities for 125 KLD has been provisioned. Also STP facility for industrial sewage for a capacity of 15 KLD shall be made for proposed project.
- Regular monitoring of the water quality and mining effluent will be done to meet the standards as prescribed by Ministry of Environment & Forests.

4.2.3 Hydrogeology

The present stage of ground water extraction in the buffer zone of the project is **30.73%** which can be categorized as safe area **(i.e. <70%).** As per Block Wise Ground Water Resource Assessment (2020) by Central Ground Water Board Chandrapur Telsil of Chandrapur district falls in safe category in which the said mine is located.

4.2.4 Augmentation of Groundwater Recharge Potential

To minimize the impact of mining on ground water system, the project/mine authority has been adopting rain water harvesting facilities.

4.3 Noise Level

4.3.1 Impact due to Noise and Vibration and its Management

The main sources of noise at the proposed project are:

- Drilling and blasting
- Coal and OB handling arrangements
- Vehicular movement

- Heavy machinery

The background noise levels would increase due to the above noise generating sources. The following noise control measures are currently in practice for the existing mine and the same shall be continued for the proposed project:

- Regular noise level monitoring would be done periodically for taking corrective action, wherever required.
- PPE shall be distributed to the manpower working near the HEMMs in the mining area.
- Vegetation along the roads shall be raised to create a barrier between the source and human settlements. This barrier will be helpful in minimizing noise levels.
- Provision of earplug for heavy earth moving machinery operator.
- Noise absorbent padding shall be provided in the crushers.
- Regular maintenance and prompt replacement of worn out parts will reduce noise to great extent.

It is therefore expected that with these measures the noise exposure level will be within the permissible limits.

4.4 Land Environment

4.4.1 Impact on Land and its Management

As the mining operations will be advanced the land use pattern of Bhatadi opencast will change due to internal backfilled dumps as well as formation of external dumps.

External OB dump & internal backfilling details:

The major part of Over Burden (OB) (83.53%) is proposed to be dumped in the internal dump and 16.47% OB will be dumped externally including embankment. Thus, external dump quantities will be minimized and placing maximum possible waste in the internal dumps shall be achieved.

Maximum height of both internal & external dump will be 90m (above ground level)
Height of individual bench - 30 m
Width of berm - 30 m

The OB dump will be reclaimed through technical reclamation and then biological reclamation. Biological reclamation shall be done by plantation of native species. This plantation will be done in phased manner.

4.5 Socio-Economic Scenario

4.5.1 Impact and management of Socio-economic impacts

- The proposed project is expected to yield a positive impact on the socio-economic environment. It helps to sustain the development of this area including further development of infrastructural facilities.
- Mining activities always improve the socio-economic condition of the area by generating the direct and indirect employment.

Rehabilitation of PAFs will be done by following state R&R provisions and CIL R&R policy. The involved homesteads will be suitably shifted to the rehabilitation site. Necessary medical and social welfare activities shall be carried out in near villagers by project proponent (PP) through CSR initiatives of project. Training on skill development and awareness programme related to health & hygiene shall also organized by PP. PP shall also adopt measures to prevent occupational diseases and health hazards.

5 ENVIRONMENTAL MONITORING PROGRAM

Environmental Monitoring Programme has been prepared for the proposed Bhatadi Opencast Expn. Project (2.0 MTPA) for assessing the efficacy of implementation of Environment Management Plan and to take corrective measures in case of any degradation in the surrounding environment. Different activities involved in the proposed expansion coal-mining project, and their impact on various environmental attributes have been taken in to account while designing a detailed environmental monitoring programme for the project.

5.1 Methodology of Monitoring Mechanism

In order to effectively implement the environmental safeguards during day to day operations of the mine coupled with due compliance to the norms, an internal monitoring mechanism has been set up by Project Proponent. The mechanism set-up starts from area (in this case Chandrapur) wherein Area Level Committee every month will review the status of compliance through a standard checklist. The report thus prepared will be submitted to WCL (HQ). The report will then be examined & reviewed by corporate level apex committee at WCL (HQ).

Project level environmental protection measures like, dust suppression, treatment and recycling of waste water, plantation, and noise control in mine premises, implementation of EMP and Environmental Clearance conditions will be monitored by the project authorities.

5.2 Project monitoring plan

5.2.1.1 Air Quality Monitoring

Air quality monitoring is essential for evaluation of the effectiveness of abatement programmes and develops appropriate control measures. A preliminary field survey will be conducted to collect information on sources of air pollution, topography, population distribution, meteorological conditions etc., for establishing a network of stations in core and buffer zone of the project for ambient air quality monitoring with reference to proposed expansion project. Ministry of Environment Forests and Climatic Change (MoEFCC) has stipulated environmental standards for coalmines vide GSR-742 (E). As per standards, the concentration of Suspended Particulate Matter (SPM), PM_{10}, $PM_{2.5}$, Sulphur dioxide (SO_2) and Oxides of Nitrogen (NO_x) will be monitored.

5.2.1.2 Water quality monitoring

Water quality monitoring involves periodical assessment of quality of mine discharge water, treated workshop effluents, treated colony effluents, ground water and surface water as per as per the Environmental Standards for coalmines, GSR-742 (E), dt. 25.09.2000.

All the parameters as given in Part-A of General Standards for Discharge of Environmental Pollutants, GSR 801 (E) EPA 1986 prescribed by CPCB must be analyzed for all the effluents, in addition to the above parameters, once in a year for assessing the overall quality of effluents.

5.2.1.3 Noise level monitoring

Noise level monitoring will be done at the noise generating sources like coal handling plant, workshop maintenance, operation of HEMMs and vehicles, nearby villages to assess the noise levels and their propagation. This will be helpful in taking necessary control measures at the source.

5.2.1.4 Monitoring of phreatic surface levels

A network of observation wells are identified for monitoring of phreatic surface levels. The trend of ground water level fluctuations will be monitored by recording of phreatic surface levels during pre-monsoon, monsoon, post-monsoon seasons and summer seasons.

5.2.1.5 Monitoring of Emergency Procedures

The Mine Manager monitors the emergencies that may occur in opencast mining operations and prepares an emergency plan to deal with fire, accidents, inundation etc. The emergency plan provisions for mock rehearsal at regular interval.

5.2.1.6 Monitoring of Mine closure plan

The monitoring of the mine closure plan is an essential requirement for review of the efficacy of the mine closure plan and to take corrective actions. The monitoring consists of measuring the air quality, water quality, preservation of landscape, aesthetic and other land use values as prescribed in the mine closure plan. Area Level Environment Management Committee will monitor the implementation of mine closure plan.

6 ADDITIONAL STUDIES

6.1 Disaster Management and Risk Assessment

A worker in a mine shall be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions shall be such as not to impair his working efficiency. This is possible only when there is adequate safety in opencast mines. Hence mine safety is one of the most essential aspects of any working mine. Safety of the mine and the employees are taken care of by the Mines Act. 1952.

Following three basic principles i.e. prevention, preparedness and mitigation of effect through rescue, recovery, relief and rehabilitation, a comprehensive disaster management plan has been made for the proposed Bhatadi Expansion OCP (2.0 MTPA) incorporating OB slope failure, explosion, fire, road accident etc.

6.2 Option/Alternative Mining Methods to Avoid Diversion of Erai River/Streams

In compliance of the Clause (ii) of additional condition of the ToR, WCL has awarded the work for “Comprehensive Study to find out the option/alternative mining methods to avoid diversion of Erai River/streams pertaining to Expansion of Bhatadi Opencast Coal Mine of WCL, Chandrapur Area” to M/s Visvesvaraya National Institute of Technology (VNIT), Nagpur, Maharashtra.

M/s Visvesvaraya National Institute of Technology (VNIT) in their study conclusion have suggested that Opencast Mining with shovel dumper in combination with the diversion of Erai River/stream is the best of the alternatives available for the Bhatadi Expansion project.

6.3 Cumulative Impact Assessment Study of Area w.r.t Tadoba Tiger Reserve

In compliance of additional conditions vide Clause (iv) of additional condition of ToR, WCL has awarded the work for a detailed comprehensive study for Environmental Impact assessment of Coalmines of WCL & Chandrapur Super Thermal Power Station on the wildlife of TATR & preparation of a conservation plan through WII & CSIR-NEERI incorporating remedial measures is respect of adverse impact of the same is already underway. The interim report submitted by WII & CSIR-NEERI is enclosed as Annexure-XI of EIA/EMP report.

6.4 Social Impact Assessment Study

As per the additional conditions vide Clause (ix & xi) of additional condition, ToR no. J11015/151/2014-IA.II(M) dated 02.06.2021 issued for the project , Social Impact Assessment and R & R in respect of SCs/STs and other weaker sections of the society in the study area needs to be carried out.

The Social Impact Assessment Study in villages for Rehabilitation and Resettlement for the proposed Bhatadi Expansion OCP (2.0 MTPA) in compliance of ToR additional condition Clause (ix) has been carried out by M/s Vikalpa. As per the recommendations of the study, WCL has adopted the best practices in the sector of Land acquisition, Rehabilitation & Resettlement. Good practices incorporated in R&R Policy of CIL-2012 such as alternate site development with all civil amenities, job allotment to affected family eligible persons, skill development for livelihood improvement, tree plantation, health check-up camps etc are being carried out in affected villages and buffer zone. The proposed project, appears to be offering the cultivators and people in the area array of hope for the betterment of the socio-economic conditions, which usher in an era of better physical quality of life.

The study of R & R in respect of SCs/STs and other weaker sections of the society in the study area has been completed by M/s Vikalpa.

7 PROJECT BENEFITS

The project is a part of overall set-up of WCL which is already completing its responsibilities committed in the area. The company has proposed this project to meet its commitment to bridge the gap of demand and supply of power grade coal. This project will yield a positive impact in terms of improvements in Physical Infrastructure & Community Development of the area, Improvements in Social Infrastructure of the local communities, Increase in Employment Potential and Contribution to the Exchequer. It will help to sustain the development of the area including further development of infrastructural facilities. Maharastra Govt. will be benefited through financial revenues by way of royalty etc. from direct and indirect operations, it has been proposed to partially outsource the overburden and coal production to an external agency with hiring/leasing of HEMM. So there will be direct employment of skilled / semi-skilled in this project as well as indirect employment generation. Also, 563 nos. direct employment is provisioned in the approved RPR of project.

8 ENVIRONMENTAL MANAGEMENT PLAN

To mitigate the adverse impacts caused due to mining operation at Proposed Bhatadi Expansion Opencast (2.0 MTPA) Project and for overall scientific development of local habitat, the Environmental Management Plan (EMP) has been formulated. The EMP is based on the base line environmental status, mining methodology and environmental impact assessment. The EMP has prescribed environmental monitoring and implementation of environmental protection measures during and after mining operations.

In addition to Environmental Management Setup at each level, WCL, HQ. will periodically inspect the project for monitoring the implementation of EMP and environmental status of the project surroundings and necessary guidelines will be given to the project authorities.

8.1 Budget Provisions

Sl. No.	Particulars	Crores per annum)
1.	Total Capital provision	Rs 729.86 Crores (including WDV of Rs 149.25 Crores)
2.	Cost of Production	Rs 2162.64 per tonne
	Sale Price	Rs. 1436.90 (for Power Sector)
1.	Environment Management Cost	₹1.95 Crore (Capital Cost) ₹ 6/ tonne of coal production ₹1.2 Crore/ Annum at production rate of 2.00 MTPA
2.	Corporate Environmental Responsibility (CER)	Rs. 2.8886 Crores
3.	Mine Closure Plan Activities	Rs.210.2248 Crores
4.	Rehabilitation & Resettlement Cost	Rs. 157.6295 crores
	No. of PAFs	1385 Nos
5.	Corporate Social Responsibility Cost	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.

9 CONCLUSION

The industrial and economic growth of India depends to a large extent on coal, which is the prime source of energy. The major requirement will come from the power sector. The balance coal is required for other industries like cement, Sponge iron etc. The industrial development and consequent economic development should lead to improvement of environment through better living and greater social awareness.

From the detailed analysis of the environmental impacts and the remedial measures proposed/recommended for the proposed expansion in capacity by 36.51% i.e., from 1.465 MTPA to 2.0 MTPA, it can be concluded that there is no significant impact so as to adversely affect the ambient air quality, water quality, ambient noise level and deterioration in the eco-system is likely to occur due to the proposed project. On the other hand, expansion of the project is likely to have several benefits like improvement in employment generation and economic growth of the area, by way of improved infrastructure facilities and better socio-economic condition.