

**EXECUTIVE SUMMARY OF
ENVIRONMENTAL IMPACT ASSESSMENT
&
ENVIRONMENTAL MANAGEMENT PLAN
FOR
Conducting Public Consultation
AS PER EIA NOTIFICATION, 2006
OF
BHATADI EXPANSION OC MINE
(2.0MTPA)**

(CHANDRAPUR AREA, WCL)

For

Expansion in Production Capacity from 1.465 MTPA to 2.0 MTPA

With increase in Mine Lease 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, 2022

Prepared by

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

(Certificate of Accreditation vide No. NABET/EIA/2124/RA 0258 valid till 22.08.2024)

CMPDI/HQ/EIA/WCL/2022-23/OCT/003/00

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EXECUTIVE SUMMARY OF EIA/EMP FOR BHATADI EXPANION OCP (2.0 MTPA)**1.1 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.

1.2 DESCRIPTION OF PROJECT

The Bhatadi project area can be approached from Nagpur-Chandrapur road partly by metalled road and partly by unmetalled 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 block. 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 48°C recorded during summer and minimum temperature of 8°C during winter. The average rainfall is 1350 mm. The project falls in Seismic Zone-IV. The prevalent grade of the composite seam is G9-G10. 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 mine to Padmapur Wagon loading station of CSTPS , Chandrapur.

Salient features of the project

Sl. No	Description	Details
A.	GENERAL	
1.	Name of Project	Bhatadi Expansion OC (2.0 MTPA)
2.	Name of Company with registered address	Western Coalfields Limited Coal Estate, Civil Lines, Nagpur – 440001
3.	Location	About 15 km NNW of Chandrapur, Maharashtra

4.	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.
5.	Village	Bhatadi Village
6.	Tehsil	Chandrapur
7.	District	Chandrapur
8.	State	Maharashtra
9.	Maximum Elevation above MSL	212m
10.	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).
11.	Seismic Zone	Zone 4
12.	Nearest Railway Station	Tadali Railway Station about 9 kms from mine
13.	Nearest Airport	Nagpur Airport -155km (Approx..ariera)
14.	Nearest Town	Chandrapur City- 15 km (Approx..)
15.	National/State Highway	National Highway-NH 930 State Highway- SH 6
16.	Ecological sensitivity of the project or activity -Wild life sanctuary	The ESZ of the Tadoba Andheri Tiger Reserve is located approx. 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
17.	Brief description of project, Size, category of the project	Capacity of Mine- 2.0 MTPA, Land Area- 1423.75 ha, Category – A
18.	Type of the proposal	Expansion Project
B.	GEOLOGICAL	
1.	Name of geological blocks considered	Bhatadi OC geological block and adjacent Bhatadi NW geological block
2.	<u>Geological Reserve:</u>	
	i. Total geological reserve	58.87 Mt
	ii. Mineable reserve	55.93 Mt
	iii. Extractable reserve	45.53 Mt
	iv. Per cent (%) of extraction	77.3% (Extractable Reserves/Total Geological Reserves)

	v. Range of ground water level	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																																						
	vi. No. of Seams & Generalized thickness range	One composite seam with multiple sub sections. Generalized thickness range 14.00 to 19.00 m.																																						
	vii. Grade of Coal	G9 (4657 kCal/Kg)																																						
C TECHNICAL																																								
i	Area of the proposed mine boundary	The total land involved in proposed Bhatadi Exp. OC mine is 1423.75 ha. <table border="1" data-bbox="564 784 1436 1299"> <thead> <tr> <th>Sl. No.</th> <th>Land Type</th> <th>Land already acquired (ha)</th> <th>Additional Land acquisition proposed (ha)</th> <th>Total Land (ha)</th> </tr> </thead> <tbody> <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 colspan="2">Sub-Total</td> <td>837.94</td> <td>565.81</td> <td>1403.75</td> </tr> <tr> <td colspan="2">Outside Mine Boundary (For village rehabilitation)</td> <td>-</td> <td>20.00</td> <td>20.00</td> </tr> <tr> <td colspan="2">Total</td> <td>837.94</td> <td>585.81</td> <td>1423.75</td> </tr> </tbody> </table>				Sl. No.	Land Type	Land already acquired (ha)	Additional Land acquisition proposed (ha)	Total Land (ha)	1	Tenancy Land	785.69	560.59	1346.28	2	Govt. Land	52.25	5.02	57.27	3	Forest Land	-	0.20	0.20	Sub-Total		837.94	565.81	1403.75	Outside Mine Boundary (For village rehabilitation)		-	20.00	20.00	Total		837.94	585.81	1423.75
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iii	Post mining land use	Sr. No.	Land use during mining	Land use (ha)				Total
				Plan tation	Wat er Bod y	Public Use	Undist-urbed	
		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
iv	Method of Mining	Opencast with Shovel – Dumper Combination						
v	Life of Mine	25 years						
vi	Manpower	563 nos.						
vii	Details of External Dumps	i) No. of Dumps	Four					
		ii) Area	271.64 ha					
		iii) Height	90 m					
		iv) Quantity	External Dump – 181.58 Mm3 (Excluding Dump D)					
		v) Year of Backfilling	10th Year from the start of mining.					
viii	Details of Internal Dumps	i) No. of Internal Dumps	Two					
		ii) Area	298.00 Ha					
		iii) Height	Upto ground level					
		iv) Quantity	217.74					
ix	Details of Final Mine Void	i) Area	212.63 Ha					
		ii) Depth	220 m(Maximum)					

Costs of the Project

Total Capital Cost	Rs 729.86 Crores (including WDV of Rs 149.25 Crores)
Cost of Production	Rs 2162.64 per tonne

Sale Price	Rs. 1436.90 (for Power Sector)
i) R&R Cost	Rs. 157.6295 crores
ii) No. of PAFs	1385 Nos
iii) Environmental Management Cost	Capital - Rs 195 Lakhs Revenue - @ Rs 6.00 per tonne

1.3 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 November'2019 to January'2020 for the proposed mine. Further 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

Baseline data of Bhatadi Expansion OCP (2.0 MTPA) was collected from November 2019 to January 2020. Further as per the directives of EAC and ToR given, the baseline data has been augmented with the additional one-month data generated in October'2021. The meteorological data of Oct'21 is given below:-

Month	Temperature °C		Relative Humidity %		Wind Speed (m/s)		Rainfall (mm)	
	Max	Min	Max	Min	Max	Min	Max	Min
October 2021	33.41	20.88	97.9	31.5	3.0	0.0	1.5	0.0

Air Environment

Air pollution parameters like Particulate Matter (PM₁₀), Particulate Matter (PM_{2.5}), Sulphur Dioxide (SO₂), and Nitrogen Dioxide (NO₂) 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 06 stations (2 core and 4 buffer) within 10km of project area during post-monsoon season (From November'2019 to January'2020). Further, as per the ToR, one month additional baseline air environment was studied by monitoring air quality at 10 stations (2 core and 8 buffer) within 10km of project area in the month of Oct'2021. The 98 percentile values monitored during baseline study of Oct'21 is given below:-

Name of Monitoring Station	98 th Percentile Value				Standard Limit			
	PM ₁₀	PM _{2.5}	NO _x	SO ₂	PM ₁₀	PM _{2.5}	NO _x	SO ₂
Vadholi Village (A1)	72	29	17	< 10	100	60	80	80
Bhatadi Village (A2)	82	38	28	12	100	60	80	80
Bhatadi Manager Office (A3)	138	52	27	22	300	-	120	120

Name of Monitoring Station	98 th Percentile Value				Standard Limit			
	PM ₁₀	PM _{2.5}	NO _x	SO ₂	PM ₁₀	PM _{2.5}	NO _x	SO ₂
Kitadi village (A4)	71	35	15	< 10	100	60	80	80
Chak Tirawanja Village (A5)	74	27	18	16	100	60	80	80
Durgapur village (A6)	82	29	18	< 10	100	60	80	80
Chinchala Village (A7)	70	31	17	< 10	100	60	80	80
Tirwanja Mokasa (A8)	76	29	17	10	100	60	80	80
Urjagram Village (A9)	77	35	17	< 10	100	60	80	80
Chandrapur Tukum (A10)	81	40	17	< 10	100	60	80	80

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.

Water Environment

The baseline data for water quality assessment of samples was taken during Nov'20 to Jan'20 for assessing various characteristics of water during the baseline data generation of proposed project. A total of 6 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. Further, baseline study has been carried out during Oct'21 for the same locations with further augmentation of two more sampling locations i.e. 1 nos. for Drinking water (Payali Village) and 1 nos. for surface water (Erai Dam). All the water samples were analyzed 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 drinking water standards (IS: 10500, 2012). The drinking water sources as such can be used for domestic purposes in the absence of better alternate source after treatment. Also, as such they are found suitable for other purposes like construction, irrigation, bathing and recreation works etc. Further, in case of surface water, the values of physico-chemical parameters were found to be well within the prescribed limits. In general, the surface water quality within the study area is suitable for use in agriculture and other domestic requirements as well as also for sustainability of aquatic life. It is also observed that all the analysed parameters of industrial effluent of existing project are well within the general standard for discharge Part A, Schedule VI.

Hydrogeology

To monitor the impact of mining on ground water levels in the study area WCL through CMPDI, RI-IV, Nagpur 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) from May'04 to Jan'19 by CMPDI,

RI-IV, Nagpur, from 2019 January onwards ground water level and quality monitoring is being carried out by Ecomen Laboratories Pvt. Ltd, Lucknow.

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

Pre monsoon period (May-June'18)	Core Zone (within 3 km radius Area)	3.65 mg/l to 5.07 mg/l
	Buffer zone (Area between 3 km and 10 km)	3.75 mg/l to 14.65 mg/l
Post monsoon (Oct-Nov' 18)	Core Zone	0.25 mg/l to 2.98 mg/l
	Buffer zone	1.02 mg/l to 11.77 mg/l
Post-monsoon (Sept'20-Oct'20)	Core Zone	5.70 mg/l to 6.30 mg/l
	Buffer zone	2.80 mg/l to 10.94 mg/l

Both Pre and Post-monsoon water level trend of well No (CB-17) situated in core zone of Bhatadi Expn. OC (village Chak Tirwanja) indicate a slightly increasing trend of water level. A rising trend in pre-monsoon and declining trend in post-monsoon water levels has been observed at the village Khergaon (CB-18) situated in buffer zone of Bhatadi Expn OC Mine.

Noise Environment

The monitoring of noise levels were done at six locations, considering the population and traffic in the area during baseline study of Nov'19-Jan'20. Four more monitoring stations were included in addition to the existing six locations for baseline monitoring done during Oct'21.

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.

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.

Ecological Resources

Floral Diversity

The study area comes under Tropical Dry Deciduous forests. Core zone is existing mine dump has floral species like *Acacia mangium* Willd, *Prosopis juliflora* (SW.) DC. , *Ailanthus excelsa* Roxb, *Pongamia pinnata* (L.) Pierre, *Tectona grandis* L. 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 quadrat method. The biodiversity in core zone is 0.88. Biodiversity in buffer zone is 0.93.

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.

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 baseline study of Nov'19 – Jan'20.

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.

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The section summarizes the pollution potential of the proposed Bhatadi Expansion project (2.0MTPA), its possible impact on the surrounding environment during operational and capacity expansion phases and the necessary management actions proposed for control and abatement of pollution.

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 PM10, PM2.5, NOx & SO2 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 incremental production of 0.535 MTPA (i.e., from 1.465 MTPA to 2.0 MTPA).

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 sprinkling on roads by mobile tankers. 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.
- Regular cleaning of paved surfaces, using mobile vacuum sweeper or a water flushing system. One number mechanical road sweeping machine is provided for the project.
- Water sprinkling arrangement at CHP, Weighbridge & Stock yard : 50 Nos. of fixed sprinklers have been installed along the CHP, Coal Stock yard, Weighbridge. Also, 30 no. ranguns are provided along Coal Stock Yard & 3 no high efficiency ranguns provided in CHP area.
- Enclosures on coal transfer points and clearing off coal dust heaps on surface.
- Wherever possible, green belt will be developed around the mine premises and also along the roadside to arrest airborne dust movement.
- Vehicular emission of particulates, SO₂, NO_x, 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 Conveyour 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 conveyour system and no road transportation is envisaged.

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. 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.

Impact due to Water Pollution and its Management

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

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 connected to the local water body.
- Heavy duty pumps will be deployed in rainy season to through the accumulated water from the working face into the garland drains.
- Mine water & 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 comprising of oil & grease trap, flash mixing and settling tank arrangement. 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 water is reused for water sprinkling to wet the top surface of 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 shall be provided for the proposed quarters. 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.

Hydrogeology

Except for coal mining, no major industrial development activity is in the area. 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.

Augmentation of Groundwater Recharge Potential

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

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.
- Extensive plantation of green belt and vegetation along the roads and around the offices to create a barrier or screen between the source and the receiver so that the noise is absorbed and the exposure level is minimized.
- Provision of earplug for heavy earth moving machinery operator, if required.
- 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 exposure level will be within the permissible limits.

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. About 333.55 Mm³ of OB out of the total 399.32 Mm³ is proposed to be backfilled in the void of Bhatadi Exn. OC and Padmapur Extn Deep OC. An additional External Dump C of height 90 m and capacity 122.19 Mm³ has been proposed along with existing external OB dumps- A and B with the balance capacity 56.07(49.69+6.38) Mm³. The major part of 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)

Slope of waste bench of internal dump - 37 degrees

Height of individual bench - 30 m

Width of berm - 30 m

Reclamation

The reclamation plan will be designed within the natural constraints of the site and particular species selection will reflect the flora known to be resistant to local condition.

Plants will be grown in backfilled area, OB dump along the road sides, mine premises and mine take area. Green belt will be developed in phased manner as per calendar program.

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.

1.5 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.

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, housekeeping, implementation of EMP and Environmental Clearance conditions will be monitored by the project authorities.

Project monitoring plan

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), dt. 25.09.2000. As per MoEFCC guidelines, the concentration of Suspended Particulate Matter (SPM), Respirable Particulate Matter (RPM), Sulphur dioxide (SO₂) and Oxides of Nitrogen (NO_x) will be monitored in downwind direction, at 500 m from the dust generating sources in core zone and monitoring of buffer zone shall be carried out as per NAAQS,2009.

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.

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 for taking necessary control measures at the source.

Monitoring of phreatic surface levels

Phreatic surface levels will be monitored throughout the life of the project by a Hydro-geologist to study the impact of opencast mining operations on ground water regime. 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.

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.

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.

1.6 ADDITIONAL STUDIES

Disaster Management and Risk Assessment

Mining and allied activities are associated with several potential hazards to both the employees and the public at large. 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. Indeed, 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.

AQIP Study

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 impact of additional production from Bhatadi OCP have been considered in the study. The increase in concentration of PM -10 due to expansion of coal mining projects have been worked out by using AERMOD (Version 9.4) software of USEPA. The Ground Level Concentration (GLC) values for particulate matter (PM10) as carried out in the prediction made by AERMOD for maximum production have been found to be within limits.

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

In compliance of the Clause (ii) of additional condition of the above 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.

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 in 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.

Social Impact Assessment Study

As per the additional conditions vide Clause (ix & xi) of additional condition, ToR no. J-11015/151/2014-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 is under process by M/s Vikalpa.

1.7 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. Maharashtra 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.

1.8 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.

Budget Provisions

SI No.	Description	Fund Allocated (in Rs. Crores)
1.	Environment Cost (Capital Provision)	Rs.1.95 Crores
	Environment Cost (Revenue Provision)	Rs. 6.0 per tonne (Approx. Rs.1.2

		Crores per annum)
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
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.

1.9 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.