EXECUTIVE SUMMARY

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PLAN

FOR

PUBLIC HEARING AS PER EIA NOTIFICATION, 2006

MAKARDHOKRA-I EXPN. OC

(UMRER AREA, WCL)

(Production Capacity From 2.0 MTPA To 3.5 MTPA)

with 614.69 ha area as phase-I

(PREPARED AS PER TOR J-11015/54/2006-IA-II(M) DATED 07.11.2019)

NOVEMBER- 2019

Prepared by

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

(Certificate of Accreditation vide No. NABET/EIA/1720/RA 0092 valid till 01.10.2020)

CMPDI/EIA/WCL/2019-20/SEPT/102/00

EXECUTIVE SUMMARY

1.0 INTRODUCTION

The existing Makardhokra-I OC mine (2.00 MTPA) is an on-going project of WCL located about 3 km west of Umrer OC mine and 10 km N-W of Umrer town of Nagpur district, Maharashtra. The Umrer township is located about 45 km south-east of Nagpur. The nearest operating mine is Dinesh (Makardhokra-III) OC in the north western side of the project. Makardhokra-II OC mine located east of Makardhokra-I OC mine has exhausted. Umrer OC mine is located to the further east of Makardhokra-II OC and Amb River separates the two mines. The Umrer Butibori railway line passes through the northern boundary of Makardhokra – I OC and exhausted Makardhokra – II OC mine as well as through the southern boundary of Dinesh (Makardhokra-III) OC.

The Ministry of Environment, Forest & Climate Change has granted Environmental Clearance for Expansion of Makardhokra-I Opencast Coal Mine Project from 1.0 MTPA to 2.0 MTPA in a lease area of 660.70 ha by letter no.J-11015/54/2006-IA-II (M) dated 26.11.2015. This Expansion in Environmental Clearance was granted under 7(ii) of EIA notification, 2006. The project of 1.0 MTPA was earlier accorded EC vide letter no. J-11015/54/2005-IA.II (M) dated 02.08.2006.

Recently, WCL has decided to liquidate the mineable reserves of operating / on-going opencast projects at a faster pace with the available infrastructure and land even with reduced life of the mine. Hence, the Mining Plan of Makardhora -I Expansion OC for enhanced 3.50 Mty capacity is justified and Mine will help in reducing the gap between demand and supply of non-coking coal for power sector.

The proposed Mining Plan has been prepared in two phases i.e. Phase-I (without acquisition of forest land and without rehabilitation of Shirpur village) and Phase-II (with acquisition of 5.61 ha forest land and rehabilitation of Shirpur village).

The Board of Directors of WCL in it's 313th meeting held on 01st August 2019 has approved Feasibility Report/ Mining Plan of Makardokra-I Expansion OC for the enhanced 3.50 Mty capacity in land area of 660.02 Ha.

Based on the approved Mining Plan, the Form – 1 document was submitted to MoEF& CC on 10.08.2019. The proposal was discussed in 48th EAC (Thermal & Coal Mining) meeting of MoEFCC and terms of References (TORs) was granted vide MoEF&CC vide letter no–J-11015/54/2006-IA-II(M) dated 07 November 2019. Subsequently on the

basis above TOR, draft EIA&EMP has been prepared for submission to Maharashtra Pollution Control Board for conducting Public Hearing and completion of public consultation process.

1.1 Location

Makardhokra Mine-I Block extends over an area of 3.743 sq.km. and is located about 3km West of Umrer colliery and about 10km NW of Umrer town of Nagpur district in Maharashtra. The Umrer township is located about 45 km south-east of Nagpur.

This Project falls in the Survey of India Topo sheet No. 55 P/1 and 55 P/5. The Geodetic co-ordinates of proposed Makardhokra - I Expn. OC are

Latitudes : N 20^{o} 50' 33" to N 20^{o} 52' 14"

Longitudes : E 79^{o} 14 7.8" to E 79^{o} 16' 24"

1.2 Communication

Makardhokra - I block is approachable from Umrer Colliery by an all weather metalled road and Umrer Colliery is connected to Umrer township by an all weather metalled road. The Umrer town is well connected by road and rail.Umrer Railway station on Nagpur-Chandrapur-Nagbhir narrow gauge railway line of the South Eastern Railway is located around 6 km east of the Makardhokra Mine-I Block. The nearest major city Nagpur is 53 km away by rail. A broad gauge railway line has been constructed from Umrer Colliery to Butibori station (about 25 km in the west from Umrer town) on Nagpur-Bombay-Madras line, for transportation of coal to western and southern parts of the country.

1.3 Topography & Drainage

The area of the block exhibits gently undulating topography and general altitude of the area ranges between 274m to 295m. The area of the block is drained by Shirpur nala flowing in the eastern direction. Small nalas and tributaries feed their water in Shirpur nala. This nala is a seasonal one and ultimately discharges into the Amb river further east near Kanwa village, which flows to the east of the block. The Amb river meets the Wainganga river near its confluence with Kanhan river about 40 km ENE of the coalfield. The highest flood level of Amb river is 274.85m.

1.4 Climate & Rainfall

The climate of the area is subtropical monsoon type characterized by hot summer and mild winter. The bulk of the precipitation is received from South-West monsoon. The monsoon breaks out in the first week of June and gradually withdraws towards the end

of September. Autumn season starts in the first week of October and lasts till the end of December. Winter is experienced in the month of January-February followed by dry and scorching summer from March to May.

The maximum and minimum temperatures are 47.3^{o} in the month of May and 5.7^{o} in the month of December. The winds are generally light to gentle breeze and wind speed ranges from 1 km to 19 km per hour. The general prevailing wind direction is from north, north-east and west. The relative humidity varies greatly during the year recording as low as 7% during summer and as high as 100% during monsoon and winter.

The average annual rainfall is 1100mm and the range is 816 mm to 1582mm. Almost 75% of the total rainfall is recorded during monsoon (July to Sept.) period.

2.0 GEO-MINING PARAMETERS

The geo-mining parameters of theMakardhokra-I Expansion OC are tabulated below:

Table 1 Geo-Mining Parameters Makardhokra-I Expansion OC

S.No	Particular	Qty.
1.	Area of the Quarry	
a)	On floor (ha)	167.95
b)	On surface (ha)	252.47
2.	Depth (m)	
a)	Initial	30
b)	Final	150
3.	Gradient of Seam	1 in 9
4.	Average thickness range of seams (m)	1.18-4.69
5.	Average Strike length (m)	2110
6.	Width on surface (m) [dip rise]	1545
7.	Width on floor (m) [dip rise]	1400
8.	Grade and GCV (kCal/kg) (0.05m dilution at each contact point)	'G-8' (GCV-4997)
9.	Mineable Reserves (Mt) as on 01.04.2018	16.30
10.	Total OB (Mm^3) as on 01.04.2019	119.85
11.	Average stripping ratio (m^3/t)	7.35

2.1 Type and Method of Mining Operations:

The proposed area of Makardhokra-I Expansion OC mine is traversed by 10 faults. Considering the production from multiple seams having average seam thickness ranging from 1.18m to 4.69 m and number of faults encountering in the property, Shovel Dumper System of mining was proposed in approved PR of Makardhokra-I OC mine. Accordingly, the existing mine is being worked by Shovel Dumper method of mining through out-sourcing agency.

Deployment of Dragline is ruled out due to multi-seam working, varying thickness of partings between the coal seams and less reserves. Due to geologically disturbed area having numerous faults and multi seam working, Surface Miner deployment is also not feasible.

Shovel Dumper System is very flexible and convenient method of opencast mining and can deal with varying geo-mining conditions and multi seam workings. It also offers flexibility for easy transition to any other technology or equipment configuration. The technology is well adopted in several opencast mines of WCL as well as in existing mine and skilled manpower is available for this method of mining.

Hence, it is proposed in this Mining Plan to deploy Shovel Dumper system for extraction of coal and OB.

With Shovel -Dumper system, two stripping methods are possible:

1. Inclined Slicing method 2. Horizontal Slicing method

In mild gradient of seams, positioning of HEMM is not difficult in inclined slicing method where benches in coal are made parallel to the seam. In horizontal slicing method, coal and OB are to be excavated in same bench and there is chance of mixing of parting OB with coal, thus, deterioration of the coal quality. In proposed Makardhokra-I Expansion OC mine, the average gradient is mild (1 in 9), hence horizontal Slicing method has been ruled out and the Shovel -Dumper system of mining with inclined Slicing is recommended for the proposed mine.

3.0 DESCRIPTION OF ENVIRONMENT AND ANTICIPATED IMPACT

The present scenario has been assessed by the data generated in by Regular Environment Monitoring carried out for the project. Summarised baseline data is provided below:

3.1 Micrometeorology

Meteorological data collected from meteorological station at Umrer OC within the core zone of the project during the study period (April, 2019 to June, 2019) reveals the following status:

Wind Speed/Direction

The climate of the district is characterized by a hot summer and general dryness throughout the year except during the south-west monsoon season, i.e., April to June.

Wind speed readings were ranging from 0.1 m/sec to 20.1 m/sec. Maximum wind speed i.e. 20.1 m/s was observed in the month of June. Also rainfall (9mm) was observed to be maximum in May.

Temperature

The maximum and minimum temperatures are 44.23^{o} in the month of June and 18.1^{o} in the month of April.

Relative Humidity

Maximum relative humidity of 93.45% was observed in the month of June while minimum was 7% in the month of May '2019.

Cloud Cover

Mostly clear sky was predominant during the study period.

Rainfall

Maximum Rainfall of 9 mm was observed in the month of May while minimum was 0.2 in the month of June 2019.

3.2 Ambient Air quality Baseline Data

Ambient air monitoring at 06 locations were carried out on during **April 2019 to June 2019** in the study area at Umrer OC mine i.e. near by mine of Makadhokra-I OC to assess the ambient air quality at the source. Major air pollutants *viz*., Particulate Matter (PM10), Particulate Matter (PM2.5), Sulphur Dioxide (SO2), Nitrogen Dioxide (NO2) and heavy metals representing the basic air quality in the region was identified in Ambient Air Quality Monitoring (AAQM).

Residential Area:

Ambient air quality monitoring results reveal that the range of SO_2 concentration was found between 11.2 µg/m^3 at A3 to 18.2 µg/m^3 at A, while NO_2 concentration was found between 12.3 µg/m^3 at A2 to 18.5 µg/m^3 at A1. These values fall within the prescribed limits of CPCB i.e. 80µg/m^3 each for residential area. The minimum & maximum concentration of PM_{10} was found to be 72µg/m^3 & 96 µg/ m^3 at A1. Minimum and maximum concentrations of $PM_{2.5}$ were found 45 µg/ m^3 at A2, A3 & A6 and 56 µg/m^3 at A1. Concentration of Heavy metals like Cadmium and Mercury was observed to be < 0.01 mg/ m^3, Lead is <0.1 µg/m^{3}at all monitoring locations where as Chromium ranges from <0.01µg/m^3 to 0.10 µg/m^3, Arsenic was found <0.1 ng/m^3 and Nickel was found to be from 0.06 ng/m^3 (A5) to 0.15 ng/m^3 (A1).

All the above values of Heavy Metals fall within the prescribed limits of CPCB.

Industrial area:

The result of monitoring at A4 site shows that the range of SO_2 concentration was from minimum12.1 µg/m^3 and maximum 18.3 µg/m^3, NO_2 concentration was from minimum 14.3 µg/m^3 and maximum 19.2 µg/m^3. The values for SO_2 and NO_2 falls well within prescribed norms by CPCB (Table 1.15). The minimum & maximum concentrations of PM_{10} were found to be from 134 µg/m^3 to 155 µg/m^3. The prescribed CPCB limit of PM_{10} was 250 µg/m^3 for Coal Mines. The Minimum and maximum concentration of $PM_{2.5}$ was found to be 48 µg/ m^3 and 56 µg/m^3. Concentration of Heavy metals like Cadmium and Mercury was found <0.01 mg/ m^3 each, Lead is <0.1 µg/m^3, Chromium was found 0.10 µg/m^3, Arsenic was found 0.02 ng/m^3 and Nickel was found to be 1.19 ng/m^3.

From the results above study, it can be concluded that air quality of the area is good as the levels are well within the limits prescribed by CPCB for NAAQM and Coal Mines.

All the values are found to be well within the NAAQ Standards prescribed by CPCB.

3.3 Water quality

To assess the water quality, six locations are identified and samples (6 Nos.) were collected and analyzed for physico-chemical and heavy metal parameters. Drinking water samples collected from the project site. The data reveals that the pH values of drinking water varied from 7.51 to 7.62, the hardness (as CaCO3) ranges from 222 to 234 mg/l, TDS ranges from 460 to 478 mg/l. Water temperature varied from 21° to 26°C. The concentration of all the parameters fall within the permissible limits as specified for drinking water standards IS: 10500, 2012.

The quality of Mine water is good. The result analysis of the collected water from sedimentation tank show that pH varies from 7.86 to 7.91, the total hardness as CaCO3 ranges from 340 to 365 mg/l. The Ca and Mg contents were observed to vary from 102.6 to 106.4 and 34.2 to 33.8 mg/l respectively. The dissolved solids range from 603 to 622 mg/l. The values of BOD varies from 2 to 2.2mg/l. The concentration of all the parameters fall within the permissible limits.

The pH values of the effluent water (ETP Outlet) varied from 7.82 to 7.76. BOD and COD varied from 8 to 10mg/l and 40 to 44mg/l respectively. Calcium was found between 84.3 to 91.8mg/l. The value of total hardness varied from 312 to 320 mg/l. Oil and grease was

found <2.5 mg/l. The values of all the parameters for ETP effluent (Treated water) were found within the General Standards for discharge of environment pollutants Part-A: Effluents for Inland surface discharge (Class A).

Regular fortnightly Monitoring of Mine water is conducted for 4 parameters ie. PH, TSS, COD and Oil and Grease. Also once in every year Mine discharge is analysed for all parameters (26 Parameters). All parameters of mine discharge are found within permissible limits.

3.4 Hydrogeological quality

The range of water levels (2018), measured from the area in and around Expansion of Makardhokra-I OC mine are given below.

Pre monsoon period May-June (2018)	Core Zone (within 3 km)	3.55 to 6.75
	Buffer zone (within 10 km)	1.80 to 12.15
Post monsoon period Oct-Nov (2018)	Core Zone	2.00 to 5.06
	Buffer zone	1.20 to 7.50
Note-water level is in meter below ground level		

3.5 Noise levels

Ambient noise levels were measured at 6 locations around the proposed project site. The noise levels recorded during the day time were from 52.3 dB(A) to 58.3 dB (A) and that during night time were from 41.8 dB (A) to 46.07 dB(A) in the study area. Thus noise levels at all locations were observed to be within the tolerance limits as prescribed by the CPCB for Residential Area and Industrial Area.

Regular noise levels monitoring is done at day time and night time is being generated at one location i.e near pit office where noise level varies from 46.5 dB(A) to 57.7 dB(A) during day time and 45.6 dB(A) to 55.6 dB(A) at night time.. All noise levels values are found to be within the prescribed limits.

3.6 Land Use

The block is mostly clouded by privately owned cultivated land. The crops are generally seasonal such as wheat, cotton, pulses etc.

Regarding land use during mining, in addition to excavation of quarry for coal, overburden dump will be created along with development of other mine related infrastructure.

Stage-wise land use table is given below:-

Sl. No.	Land use category	Present (1st year)	5th year	Post Mining
1	Backfilled Area	0	25	25
	(Reclaimed with plantation)	0	0	100
2	Quarry Area(Not reclaimed)/void (Reclaimed with plantation)	85.04	227.96	227.96
3	External OB dump	18.75	167.57	167.57
	(Reclaimed with plantation)	12	20	20
4	Infrastructure	13	13	13
	(Reclaimed with plantation)	0	2	2
5	Roads	2	2	2
		0.5	0.5	0.5
6	Temporary Top Soil Dump	20	30.38	30.38
	(Reclaimed with plantation)	0	0	0
7	Undisturbed area	465.9	138.78	138.78
		0	10	10
8	Land for Village Rehabilitation	10	10	10
	Total	**614.69**	**614.69**	**614.69**
	Total Plantation	**12.5**	**32.50**	**32.50**

Post mining land use is shown in the following table:-

Sl. No.	**Land use during mining**	**Land Use (ha)**				
		Plantation	**Water Body**	**Public use**	**Undisturbed**	**Total**
1.	Backfillled Area	0.00	0.00	0.0	25.00	25.00
2	External OB Dump	20.00	0.00	0	147.57	167.57
3	Excavated Area	0.00	227.96	0	0.00	227.96
4	Road	0.50	0.00	1.5	1.50	2.00
5	Infrastructure	2.00	0.00	0.00	11.00	13.00
6	TopSoil Dump	0.00	0.00	0.00	30.38	30.38
7	Miscellaneous (300m blasting zone, river diversion, power line diversion & rationalization	10.00	0.00	0.00	128.78	138.78
8	Land for Village Rehabilitation	0.00	0.00	10.00	0	10
Total		32.50	227.96	11.5	342.73	614.69

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.

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 16216r 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 Makardhokra- I 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_2, NOx, hydrocarbons can be minimized by proper training and maintenance of vehicles and other oil - operated equipment.

h) Regular monitoring of ambient air quality as per CPCB rules for Coal Mines.

Plantation to Check Air Pollution

Plantation will be under taken in the mine area as mitigative measure against air pollution, noise pollution and to increase the aesthetic value. The plantation will be developed at suitable places like overburden dump, along the road sides, unused land

etc. to arrest dust generated due to various mining operations viz. quarrying, coal and OB transportation, OB dumping, CHP operation.

2500 plants/ha are proposed as plantation density. It can be observed that out of 614.69 Ha project area, 32.50 Ha is proposed as plantation in post mining scenario, which is 5.28% of the total project area. This magnitude of plantation would serve purpose of restoring a good quality of ecosystem.

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 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. In case if acid mine discharge is reported at any point of time, necessary action should be taken to treat the acid mine dicharge.

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

i) Industrial Effluent

The waste-water from workshop and CHP, which normally remain laden with oil and grease, suspended and dissolved solids etc. is treated in the Effluent Treatment Plant (ETP). A 100 KL Effluent Treatment plant has been commissioned at Makardhokda-I expansion OC. Clear water coming out from the treatment plant is taken into the closed water circuit and recycled for its reuse. All parameter of ETP waste discharge are monitored regularly as per Env. (Protection) Amendment Rule, 2000. During expansion, the waste water flow from ETP will increase on account of increase in heavy machinery. A budgetary provision of Rs 10.25 Lakhs has been made in the approved Project Report 2014 for Effluent treatment plant modification for treatement of workshop effluent.

ii) Mine Water

The quality of water is vital for mankind since it is directly linked with human welfare. Water quality characteristics of aquatic environments arise from multitude of physical, chemical and biological interactions. The water bodies are continuously subjected to dynamic state of changes with respect to their geochemical characteristics. The aquatic ecosystem is upset by human activities resulting in pollution, which disturb the normal uses of water for public water supply, industry, agriculture etc.

Provision of Rs 15.37 Lakhs has been made in the approved Project Report 2014 for Sedimentation Pond Upgradation for Treatment of Mine Waste water (budgetary provision).

iii) Surface Run-off

Adequate numbers of vegetation will be grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it will also reduce surface run-off, which hellps averting siltation of natural water courses. Garland drains and catch drains has been constructed for surface run-off.

iv) Sewage Water

As no provisions of new residential buildings are envisaged for the proposed manpower of the mine, sewage treatment plant for colony is not proposed.

Impact on Hydro-Geological Regime

In the opencast mines, the different aquifers overlying the working coal seam would be contributing groundwater to the mine by gravity drainage since they are exposed/removed at the mine. The anticipated groundwater inflow to the mine is to the tune of 8102m^3/day(approx.). As such due to this pumping/gravity drainage, cone of depression would be formed. The shape and extent of the cone would depend on mainly hydraulic conductivity and specific yield of aquifers, mine depth & area etc.

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

The radius of mine influence area estimated for the Makardhokra –I Expansion OC is 10km respectively based on the above mentioned aquifer. The stage of ground

water development in the buffer zone (10 km from the periphery of the core zone) of Makardhokra –I Expansion OC comes to about 16.58 %.

Conservation Measures:

1. The mine discharge will be utilized to meet the mine's domestic, dust suppression, firefighting and other industrial water needs.
2. The artificial recharge by water conservation structures in the outside mine influence areas will check water level lowering. The impact on ground water level is being minimized by artificial recharge by spreading of pumped out water, creation and filling of ponds with mine water and construction of rainwater harvesting structure.
3. After the cessation of mining, with copious rainfall and abundant groundwater recharge, the water levels will recoup and attain normalcy. Thus, the impact of mining on groundwater system may be considered as a temporary phenomenon. The old mine workings also behave as water pools and improves the resource availability in the area.
4. The discharged mine water would be available for the local people to utilize in irrigation and domestic use. Thereby the mine water will be a resource for many of the local villagers.
5. Monitoring of water quality of mine water discharge, local river/nala and domestic water (dug well/hand pumps) will be done under routine monitoring. On analyzing the field data if any area receiving the maximum impact, suitable controls measures will be adopted by the project authorities.

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 proposed quarry floor and quarry surface in Phase-I has been shown in Quarry and Surface layout Plan.

Initially, Environmental Clearance for Phase-I of Mining Plan for Makardhokra-I Expansion OC mine involving 614.69 ha land will be obtained. The life of Phase-I of Mining plan considering target capacity of 3.50 MTPA will be 5 years.

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

The following activities have been proposed for reclamation of land.

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

4.5 Rehabilitation & Resettlement

Rehabilitation and resettlement is not involved in Phase-I of Makardhokra -I Expansion OC, Umrer Area as per approved Mining Plan, July 2019.

4.6 Progressive Mine Closure Plan

The mine closure cost will cover the different mine closure activities for which a corpus fund has been created by opening an escrow account with the coal controller organization in nationalized bank. An amount @ Rs 6.00 lakhs per ha of the project area will be deposited in this account for final mine closure. Progressive mine closure will be done with the fund provided in approved Mining Plan 2019. The financial provision for closure of Project Report Makardhokra-I Expansion OC for the entire mine life comes out to be around Rs. **Rs. 5297.48 lakhs** (based on April, 2019 WPI @ Rs 6 lakh/ Ha and 5% escalation each year).

5.0 ENVIRONMENTAL MONITORING PROGRAMME

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

Environment Management Cell

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

level, Area General Manager co-ordinates the activities of various disciplines in the area to render all necessary assistance at the implementing level i.e. the Project level. Nodal Officer (Environment) of the area monitors all aspects of environment on behalf of the Area General Manager. He will also take suitable steps for generation of environmental data along with CMPDI team for its analysis and interpretations.

6.0 ENVIRONMENTAL COST PROJECTION

As per Project Report March 2014, a capital provision of Rs 97.09 lakhs has been made against environment protection. Also Rs. 5.00/t of coal has been provided to absorb environmental related cost in the project.

7.0 PROVISION FOR CSR WORK

The regular CSR activites will be taken up during running of project . As per the policy, the fund for the CSR will be allocated based on 2% of the average net profit of the Company for the three immediate preceding financial years or Rs 2.00 per Tonne of Coal Production of the previous year whichever is higher.

The increase in production from 2.0 MTPA to 3.5 MTPA will lead to increase in the CSR fund which will be utilised for various development activities infrastructural development works, health care & educational facilities in neighbouring villages as per the requirement

As Makardhokra-I Expansion OC. is an operating OC mine various CSR activities are being undertaken.Expenditure incurred for works carried out in Umrer Area under CSR for last 9 years is given below:

Expenditure incurred in CSR

Year	Expenditure incurred on CSR activities (Rupees in Lakhs)
2010-2011	49.59
2011-2012	85.80
2012-2013	152.98
2013-2014	216.88
2014-2015	39.98
2015-2016	8.46
2016-2017	6.09
2017-2018	15.84
2018-2019	12.01

8.0 CONCLUSION

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

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

The Makardhoka-I Expansion 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 target of 1 BT of domestic coal production.