EXECUTIVE SUMMARY

1.1 INTRODUCTION

New Majri UG to OC Mine is located in Bhadrawati Tehsil of Chandrapur district of Maharashtra and about 135 km south of Nagpur by road. The existing New Majri UG to OC mine is conversion of New Majri underground Colliery into opencast mine. New Majri UG mine is situated in Wardha valley coalfields of WCL and is separated into two parts by Wani-Rajur railway line, namely southern and northern part.

Environment clearance for New Majri UG to OC with production capacity of 0.80 MTPA within ML Area of 479.16 ha was obtained from MoEF&CC vide ref no. J-1015/25/2008-IA.II (M) Dt. 18.02.2011.New Majri UG to OC mine started production on 23.05.2015 and achieved its target capacity in 1st year itself (2015-16). Since, the mine had potential to produce more than target capacity, a Mining Plan was prepared for enhanced capacity of 1.20 MTPA which was approved by WCL Board on 29.09.2016. Based on this Mining Plan, Environmental Clearance for production capacity of 1.20 MTPA within ML Area of 479.16 ha was obtained from MoEF&CC vide ref no. J-1015/25/2008-IA.II (M) dated 13.02.2017.

The mine achieved 1.20 Mty capacity in the year 2016-17 and 2017-18. New Majri UG to OC mine has longer strike length and therefore the production capacity can be increased to normative capacity of 3.0 MTPA and peak capacity of 3.75 if the entire strike length is opened. Coal reserves are available in dip side of existing boundary of New Majri UG to OC mine and there is scope of further expansion of the mine in dip side to have additional mineable reserves for reasonable mine life at enhanced target capacity. Thus the Project Report for production capacity of 3.00 MTPA (Normative) and 3.75 MTPA (Peak) within ML area of 706.28 ha was prepared and approved by WCL Board in its 31st meeting held on 25.05.2019 vide letter WCL/BD/SECTT/BM-31/2019/539 dated 07.06.2019.

Based on the approved Project Report, the Form – 1 document was submitted to MoEF&CC. The proposal was discussed in 6th EAC (Thermal & Coal Mining) meeting of MoEFCC and standard terms of References (TORs) was granted vide letter no J-11015/25/2008-IA.II(M) dated 23.10.2019. Subsequently on the basis above TOR, this Draft EIA&EMP has been prepared for submission to Maharashtra Pollution Control Board for conducting Public Hearing and completion of public consultation process.

1.1.1 Location

The proposed New Majri UG to OC Expansion mine is located in Majri Area of WCL in Chandrapur district of Maharashtra state. The area of New Majri UG to OC expansion mine is bounded by latitudes N 20°06'45.43" to 20°08'43.08" and Longitude E 79°00'13.53" to 79°01'59.9". The block is covered in the Survey of India Toposheet No.-55 P/4.

1.1.2 Communication

New Majri UG to OC mine is well connected by road and rail. Majri–Khadan railway station at New Majri Colliery is on Majri – Rajur branch line of Central Railway. It is 3 km SW of Majri railway station which is on Wardha – Kazipeth main line of Central Railway. The colliery is approached through Warora – Wani road which branches from Nagpur – Chandrapur highway near Warora town, about 20 km from New Majri. The distance from New Majri to Nagpur by road is approx. 130 km and the same for Chandrapur town HQ is approx. 70 km.

1.1.3 Topography & Drainage:

The characteristic land pattern of project area is a north-south trending raised ground in the central part between the altitudes 190 m to 194 m. The western part of this raised ground slopes into Wardha River. The HFL of Wardha River is reported to be 193.65 m as observed in 1994 in New Majri Colliery area with reference to the assumed RL of Bench Mark of the colliery.

The Koradi nala with its branches and gullies passes through the eastern part of project area and joins with Shirna nala further to the east. The HFL of Koradi nala & Shirna nala is reported to be 192.45 m. The entire up-dip side of the project area i.e. the quarriable zone is under the HFL because of these nalas flowing through the area. The topography in this part varies between 185 m to 190 m.

1.1.4 Climate & Rainfall

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

1.2 GEO-MINING PARAMETERS

The geo-mining parameters of the New Majri UG to OC are tabulated below:

Table 1 Geo-Mining Parameters New Majri UG to OC

Sl. No.	Particular	Qty.
1.	Area of the Quarry	
a)	On floor (ha)	235.03
b)	On surface (ha)	358.35
2.	Depth (m)	
a)	Initial	52
b)	Final	250
3.	Gradient of Seam	1 in 4.6 in Northern part to 1 in 4.8 in Southern part
4.	Average thickness range of seams (m)	12.88 to 18.89
5.	Average Strike length (m)	2163
6.	Width on surface (m) [dip rise]	1316
7.	Width on floor (m) [dip rise]	1073
8.	Grade and GCV (kCal/kg) (0.05m dilution at each contact point)	'G-1' (GCV-415)
9.	Mineable Reserves (Mt) as on 01.04.2018	36.09
10.	Total OB (Mm^3) as on 01.04.2018	373.18
1.	Average stripping ratio (m^3/t)	10.34

Type and Method of Mining Operations: In the proposed New Majri UG to OC Expansion mine, the gradient of seam is steep (1 in 4.6 to 1in 4.8) and the composite seam has been extensively worked by underground method of mining. Hence, deployment of dragline as well as Surface Miner is ruled out.

Shovel Dumper System is very flexible and convenient method of opencast mining and can deal with varying geo-mining conditions and developed seam by underground mining. 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 and skilled manpower is available for this method of mining. Shovel Dumper mining is being practiced in existing New Majri UG to OC mine and therefore, the same system of mining has been recommended in the proposed Expansion mine.

1.3 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:

1.3.1 Micrometeorology

Meteorological data collected at meteorological station of Continuous Ambient Air Quality Monitoring Station (CAAQMS) located within the core zone of the project during the study period (15th Feb, 2019 to 31st May, 2019) reveals the following status:

Wind Speed/Direction

Generally, moderate to stronger winds prevailed throughout the season. Winds were moderate particularly during the morning hours. During the afternoon hours the winds were stronger. Wind speed readings were ranging from ≤0.5 m/sec to 4.21 m/sec. The seasonal average wind speed was observed to be 2.63 m/sec. The wind pattern of the study period is presented below:

The analysis of wind pattern during the season showed that the predominant wind directions were from South, West and South West.

Temperature

Temperature values ranged between 23.14^{O}C to 47.78^{O}C. The seasonal average temperature value during this period was found to be 38.28^{O}C.

Relative Humidity

The daily average relative humidity values were in the range of 14.91 to 79.85%. The seasonal average humidity value was found to be 34.30%.

Cloud Cover

Mostly clear sky was predominant during the study period.

Rainfall

Total 50 mm rainfall was recorded during the study period. The average rainfall during the season was found to be 0.47 mm.

1.3.2 Ambient Air quality Baseline Data

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

Table 2 Ambient Air quality Baseline Data

S. N	Village	PM-10				PM-2.5				NOx				SOX			
		98th Percentile	Min	Max	Avg	98th percentile	Min	Max	Avg	98th percentile	Min	Max	Avg	98th percentile	Min	Max	Avg
Core Zone																	
2	Manager office	282.10	23	286	108.35	107.88	0	129	40.33	40.42	10	49	22.98	52.06	6	55.1	17.78
3	Patala magazine	171.12	13	216	78.45	101.40	9	120	41.69	49.96	13	57	22.89	43.74	5	47	16.81
4	NMOC substation	215.44	21	258	87.1	81.04	6	95	38.03	53.8	13	69	24.10	48.94	5	55.1	19.33
Permissible Limit		300				-				120				120			
Buffer Zone																	
1	Kuchna colony	238.68	13	295	74.31	150.50	7	175	43.14	48.20	8	57	22.62	43.77	6	47.2	16.49
5	New Majri Basti	169.98	14	201	69.62	60.60	5	64	28.10	58.66	4	69	23.25	40.1	5	51.2	17.69
6	Deulwada village	131.24	5	137	55.59	70	9	82	35.79	25.33	4	26	18.74	33.1	4	35.8	15.10
7	Ektanagar colony	141.80	6	161	65.31	66.36	8	69	36.84	26.08	4	28	21.06	37.58	5	39.04	16.80
8	Pimpri village	125.28	13	250	59.75	63.24	6	68	35.95	23.96	2	32	18.23	32.30	7	33.7	16.01
9	Chargaon village	179.62	9	205	63.01	72.04	10	81	39.52	26.00	3	26	19.92	44.91	5	51.3	16.85
10	Pragatinagar Colony	265.80	16	312	91.20	68.60	5	72	39.50	24.96	2	32	18.87	37.24	5	41.4	18.87
1	Dhorwasa village	166.36	14	184	73.41	82.12	9	94	37.60	25.02	3	25.1	39.98	25.02	6	43	16.63
Permissible Limit		100				60				80				80			

1.3.3 Water quality

In general, the water quality in Wardha River (Upstream & Downstream) are found to be within the prescribed norms of, IS: 10500 – 1991 (permissible) and IS: 2296 – 1982 except BOD and Standard of mine discharge as notified vide notification G.S.R. 742(E), dated 25.9.2000. The maximum BOD level was observed to be 6 mg/l. It may have been contributed by discharge of untreated water from the village in the Wardha River.

1.3.4 Hydrogeological quality

The average water levels fluctuations measured from the area in and around in year 2018 for New Majri UG to OC are given below.

Pre monsoon period May-June	Buffer zone (within 10 km)	2.85 m to 10.85 m
Post monsoon period Oct-Nov	Buffer zone	1.15 m to 10.45 m

1.3.5 Noise levels

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

1.3.6 Land Use

Present Land use of the land required for New Majri UG to OC is given below:

Table 3 Present Land use of the land required for New Majri UG to OC

Sl. No.	Particulars	Tenancy land (ha)	Govt. Land (ha)	Forest Land (ha)	Total Land (ha)
1	Land required for existing New Majri UG to OC mine	460.21	18.95	Nil	479.16
2	Addl. Land to be acquired for Expansion of the mine	220.30	6.82	Nil	227.12
3	Total Land involved in the New Majri UG to OC Expansion mine	**680.51**	**25.77**	**Nil**	**706.28**

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

Table 4 Land Use Pattern

Sl. No.	Particulars	Existing Area (ha)	Proposed Area (ha)
1.	Quarry Area	14.35	358.35
2.	Future Extension Quarry	137.10	-
3.	External OB dump	84.60	84.60
4.	BC Soil Dump	4.20	4.20
5.	Colony / Infrastructure	10.00	15.00
6.	Embankment	12.90	53.20
7.	Safety zone along Dump	64.62	47.49
8.	Blasting Zone		58.69
9.	Area needed for rationalization	51.39	84.75
	Total Land	**479.16**	**706.28**

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

Table 5 Land use at the end of the mine

Sl. No.	Land use during mining	Land use (ha)				
		Plantation	Water Body	Public use	Undisturbed	Total
1	External OB Dump	84.60	0.00	0.00	0.00	84.60
2	Top soil dump	4.20	0.00	0.00	0.00	4.20
3	Excavation	0.00	358.35	0.00	0.00	358.35
4	Infrastructure	2.00	0.00	13.00	0.00	15.00
5	Embankment	4.00	0.00	49.20	0.00	53.20
6	Undisturbed Area	140.00	0.00	0.00	50.93	190.93
	Total	**234.80**	**358.35**	**62.20**	**50.93**	**706.28**

1.3.7 Socio Economic:

Positive impacts on socio-economic environment are expected due to creation of direct and indirect employment opportunities and development of infrastructure such as roads, schools, hospitals etc. The social infrastructure will be developed under the CSR and CER. Total Rs 2.99 crore will be spent on the Corporate Environment Responsibility.

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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

1.4.1 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 expansion of min.

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. About 140.0 ha of plantation will be carried out in undisturbed area as green belt. Total 234.84 ha out of total 706.28 ha (33%) area will be planted till the end of mine life. 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.

1.4.2 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. Effect of coal mining due to nearby mines of Majri area on water is mainly observed as increase in suspended solids. However, in past acid mine discharge has been reported in the nearby New Majri II(A) OC. Till date no acid mine dicharge has been reported in New Majri UG to OC. However, it is essential to continuly monitor the mine water discharge quality. 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 New Majri UG to 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. Hence, an additional Effluent Treatment Plant of 100 KL is being proposed to be installed for treatment of additional waste water. A provision of Rs 25 Lakh has been made in the approved Project Report for installation of additional ETP.

ii) Mine Water

The mine is conversion of underground coal mine to opencast coal mine. At present the water accumulates in the underground galleries. No mine discharge is being done from the opencast working area. However in future the pumps will be installed in the quarry for discharge of mine water. Most of the suspended particles will be settled in the sump located in the quarry and the supernatant water will be pumped out to the sedimentation tank present on surface. This water is to be passed through sedimentation pond on surface, before being reused or discharged in to River. A sedimentation tank has been constructed at New Majri UG to OC with dimension of 50 mtr x 18 mtr x 1.20 mtr (with 2 nos. baffle walls). For the expansion proposal an additional sedimentation tank has been

proposed. Provision of Rs 25.00 Lakhs has been made in the approved Project Report for the construction of additional sedimentation tank.

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 provision of new residential buildings are envisaged for the proposed manpower of the mine, sewage treatment plant for colony is not proposed. However, a sewage treatment plant for treatment of sewage generated at mine site is being proposed to be installed. Capital provision of Rs 15.0 Lakhs has been made for installation of STP at mine site.

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 1031m^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 New Majri UG to OC is 650 m respectively based on the above mentioned aquifer. The stage of ground water development in the buffer zone (10 km from the periphery of the core zone) of New Majri UG to OC comes to about 39.43%.

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.

1.4.3 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.

1.4.4 Impact on Land and Land Reclamation

The existing ML area of New Majri UG to OC is 479.16 ha (460.21 ha tenancy land and 18.95 ha government land). Out of 479.16 ha land, 455.77 ha land (436.82 ha tenancy land and 140.78 ha government land) has been acquired.

The proposed Expansion of New Majri UG to OC mine has envisaged further expansion of mine in dip side and the total land involved in this Expansion including the existing mine area works out to 706.28 ha (680.51 ha tenancy and 25.77 ha govt. land).

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

2. Grass, legumes and different types of plants etc. will be planted on such reclaimed land in order to make it, as far as possible, conducive to agricultural growth.

3. Technical and biological reclamation of external OB dump and rehandling at the end of mine life. The density of trees will be around 2500 plants/ha.

1.4.5 Rehabilitation & Resettlement

Provision for Rehabilitation and resettlement of villages has been made as per **Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.**

However, in absence of land data, the capital requirement for land has been calculated based on the rate of tenancy land @ 32.00 lakhs per hectare (Rs. 8.00 lakh per hectare x multiplying factor of 2.0 for rural area x 2 for 100% solatium). The additional tenancy land to be acquired for the proposed Expansion of New Majri UG to OC mine is 243.69 ha. In absence of data, 3 no. of adults (project affected family) per ha of tenancy land has been considered in approved Project Report and thus total no. of PAFs works out to 732 (3 x 244). Since, the choice of PAFs regarding monetary compensation, employment or annuity is not available, for economic evaluation, monetary compensation has been considered for 50% of total project affected families (50% of 732 = say 366) @ Rs. 5 Lakhs per PAF. In case employment is demanded by project affected families, the monetary compensation amount will reduce accordingly.

In addition to this, capital requirement has been worked out for Rehabilitation and Resettlement of 10 houses (40 nos of houses in WCL land & 70 nos of houses in private land) located within the proposed mine boundary.

Provision of Rs 3,268.36 Lakhs has been made for the rehabilitation and resettlement of land and house outsees as per LAAR, 2013.

1.4.6 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 report. The financial provision for closure of Project Report New Majri UG to OC for the entire mine life comes out to be around Rs. **Rs. 8302.97 lakhs** (based on February, 2019 WPI @ Rs 6 lakh/ Ha and 5% escalation each year).

1.5 ENVIRONMENTAL MONITORING PROGRAMME

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

Environment Management Cell

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

1.6 ENVIRONMENTAL COST PROJECTION

A capital provision of Rs 2104.08 lakhs has been made against environment protection. Rs. 6.00/t of coal has been provided to absorb environmental related cost in the project.

1.7 PROVISION FOR CSR WORK

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

1.8 CONCLUSION

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

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

The New Majri UG to OCC 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.