

MINING PLAN**Penganga Opencast (Expansion) mine**

(Enhancement In Production Capacity By 40% From 4.5 MTPA To 6.3 MTPA)

1. INTRODUCTION

The Penganga OC Mine (Mungoli Expansion Block) is located in the South of existing Mungoli OC / Kolgaon OC Mines, which forms the south -western most coal bearing area of western limb of Wardha Valley Coalfields limited, under Chandrapur district of Maharashtra state and it is under the administrative control of Wani Area of Western Coalfields Limited.

The Project Report of Penganga OC (2008) was approved by WCL Board in 214th meeting held on 23.10.2008 and based on the aforesaid approved PR, the Environment Clearance (EC) of 4.5 MTPA having Mining Lease hold area of 781.00 Ha (ML area 766 Ha & outside ML area 15 Ha)(there was no forest land involved) has been granted by Ministry of Environment Forest and Climate Change (MOEF and CC), New Delhi vide letter number J-11015/46/2009-IA-II(M) on 31.01.2013.

The enhanced land rates, new R&R policy 2012 and other cost parameters necessitated updation of Project Report of Penganga OC. Accordingly the Revised Project Report of Penganga OC was completed in August 2014 and approval of WCL Board (257th meeting held on 27.09.2014) was secured vide letter no. WCL/BD/SECTT/BM -257/2014/1601 dated 02.10.2014. In this PR, the total land involved is 763.06 Ha (wherein the land of 15 Ha earmarked for colony outside ML area was deleted & the area finalized based on 7/12 records). The area of 763.06 Ha comprises of 743.83 Ha of project activity area (ML area) & 19.23 Ha outside ML area. There is no forest land involved.

Mining operations has been started since 01.06.2015 and the mine is expected to achieve its EC capacity of 4.5 MTPA, during the financial year 2018-19.

As per the direction of Govt. of India, the production level of the Western Coalfields Limited should be increased to achieve the demands of the power sectors to bridge the gap between the supply and demand of coal and it is proposed to enhance the annual coal production rate of Penganga OC Mine by 40 % (i.e. from 4.5 MTPA to 6.30 MTPA) within the existing set up without any capital infusion.

As such this Mining Plan including the mine closure plan is prepared for obtaining approval of WCL Board. On receipt of the same, application for securing fresh EC for 40% enhancement in capacity will be made to MoEF&CC u/s 7 (ii) of EIA notification,2006.

2. NEED FOR ENHANCEMENT OF CAPACITY

The present scenario of the company and as per the direction of Govt. of India, the production level of the Western Coalfields Limited is to be increased to fulfill the demands of the power sectors & other coal consumers to meet the gap between demand & supply of coal. As such, the proposed enhancement will help WCL in adding a capacity of 1.80 MTPA which will lead in reduction of demand-supply gap to that extent without any capital investment.

3. LOCATION & COMMUNICATION

The area of Mungoli Extension Block falls in the Korpana tehsil of Chandrapur district of Maharashtra State. The area is bounded by Latitudes : N 19°50'24" to 19°52'02" Longitudes: E 79°06'56" to 79°09'16". The block is covered in the survey of India Toposheet No.- 56 M/1.

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4. PHYSIOGRAPHY AND DRAINAGE:

The entire area of the mine block is covered by agriculture land with black cotton soil and exhibits gently undulating topography with general slope from south to north direction. The altitude of the area ranges between 176.60 m and 189.73 m. The HFL of the Mine area is 185 m and whole quarry area falls below HFL. The total accumulated water of the area is drained into the Penganga River through drainage system and before discharging into river it is treated through sedimentation tank. There are few seasonal nallahs which are passing through the area and their flow direction is from

south to north. These nallahs joins to the easterly flowing Penganga River in the north direction which ultimately joins to Wardha River near Jugad Village.

5. GEOLOGY:

5.1 General

MECL has drilled one regional borehole MWSM-1 in the northern part of south of Mungoli Block (Mungoli Extn. Block) during the period 28.3.1998 to 06.5.1998 to locate shallow occurrence of coal further south of Mungoli O.C. Mine. Based on the data of this borehole, MECL has prepared a geological note entitled "Geological Note on exploration for coal in South of Mungoli Block, Wardha Valley Coalfield, Dist. – Chandrapur (M.S.) in April, 1999". Based on the positive borehole data, CMPDI has taken up detailed drilling to locate the occurrence of shallow coal in this area. Later on Total 44 boreholes were drilled by CMPDI in Mugoli Extn. Block with the total meterage of 4846.50 m. during the period from 20.7.2005 to 12.6.2007. The year wise and agency wise breakup of the boreholes and meterage considered for this documentation are given below.

Period of Drilling	No. of boreholes	Meterage Drilled (m)
1. CMPDI		
2005 – 2006	26	3035.00
2006 – 2007	12	1227.00
2007 – 2008	6	584.50
Sub-Total	44	
2. MECL		
1998-1999	1	204.00
Total	45	5050.50

TABLE NO 1: AGENCY WISE & YEARWISE DRILLING, MUGOLI EXTN. BLOCK

The Project report is based on "Geological Note on Exploration for coal in South of Mugoli Block, MECL, April,1999" and "Geological Report on Mugoli Extension Block, CMPDI, December,2007". Total 45 bore holes were drilled in an area of 2.26 Km². Borehole density is 20.

SECTOR

Based on fault pattern, the limits of the sectors for reserve estimation have been determined. Total 3 sectors viz. I, II & III have been demarcated. The limits of Sectors-I, II III are given below in Table.

TABLE NO 2: LIMIT OF SECTORS, MUGOLI EXTN. BLOCK

Sector	North	South	East	West
I	Southern edge of Penganga river	Fault F ₆ -F ₆	Subcrop of Composite Seam (below Kamthi Formation)	Fault F ₆ -F ₆
II	Southern edge of Penganga river	Arbitrary Line	Subcrop of Composite Seam (below Kamthi Formation)	Fault F ₈ -F ₈ & Fault F ₇ -F ₇ & Penganga River
III	Southern edge of Penganga river	Fault F ₈ -F ₈	Fault F ₇ -F ₇	Fault F ₈ -F ₈ & Penganga River

5.2 Geological Reserves

The details of quarriable net proved geological reserves is given below:

TABLE NO 3: SECTORWISE & DEPTHWISE NET PROVED QUARRIABLE RESERVES OF GEOLOGICAL BLOCK

Sector	Depth (m)					Total reserves (Mt)
	< 50	50 – 100	100 - 150	150 - 200	> 200	
A) ABOVE HFL AREA						
SECTOR-I	1.014	-	-	-	-	1.014
SECTOR-II	-	10.754	7.281	-	-	18.035
SECTOR-III	-	0.721	4.289	0.503	-	5.513

Sector	Depth (m)					Total reserves (Mt)
	< 50	50 – 100	100 - 150	150 - 200	> 200	
SUB-TOTAL	1.014	11.475	11.570	0.503	-	24.562
B) BELOW HFL AREA						
SECTOR –I	2.699	-	-	-	-	2.699
SECTOR-II	4.395	8.115	4.100	2.667	0.388	19.665
SECTOR-III	-	-	2.685	4.062	1.225	7.972
SUB-TOTAL	7.094	8.115	6.785	6.729	1.613	30.336
TOTAL	8.108	19.590	18.355	7.232	1.613	54.898

5.3 DESCRIPTION OF COAL SEAMS

5.3.1 SEQUENCE OF COAL SEAMS

The sequence of coal seams encountered in the boreholes drilled by CMPDI in Mugoli Extension Block in ascending order are furnished below

TABLE NO 4: SEQUENCE OF COAL SEAMS, MUGOLI EXTN.BLOCK

Coal seam/ Parting	Thickness range (m)		Generalised thickness range (m)
	Minimum	Maximum	
Composite-A Section	0.75 m (CMWVG – 37)	2.72 m (CMWVG – 24)	1.00 - 2.00
Parting	0.30 m (CMWVG-33)	1.95 m (CMWVG-37)	
Composite-B Section	0.72 m (MWSM – 1)	4.02 m (CMWVG – 20)	2.50 – 3.50
Parting	0.27 m (CMWVG-39)	2.74 m (CMWVG-56)	
Composite-C Section	1.31 m (CMWVG – 33)	4.26 m (CMWVG – 22)	2.00 – 3.50
Parting	3.54 m (CMWVG-15)	7.06 m (MWSM-1)	

Composite-D Section	7.65 m (CMWMG – 38)	11.65 m (CMWMG – 21)	9.70 – 11.00
Composite-A+B+C+D Sections (excluding > 1.00 m parting)	14.84 m (CMWMG – 11)	22.19 m (CMWMG – 24)	17.50– 20.50

It could be seen from the above table that the seams sections encountered in Mugoli Extn. Block are potential and persistent in nature in the entire area of the block.

5.3.2 COMPOSITE SEAM

The Composite Seam, which is about 21 m to 26 m thickness including all dirt bands and parting in the present area occurs in 4 sections viz. Composite-A Section, Composite-B Section, Composite-C Section and Composite-D Section. The parting between Composite-A+B+C Sections and Composite-D Section varies from 3.54 m (CMWMG-15) to 7.06 m (MWSM-1). All sections of the Composite Seam are virgin.

5.4 STRIKE AND DIP

The general strike of the coal seam is north-south in the major part of the area with minor swing in central part of the area as determined from the floor contour plan of Composite-D Section. In the sub crop zone near boreholes CMWMG-17 & 28 the strike becomes northwest-southeast. The dip of the strata ranges from 4° to 7.5° (gradient 1 in 7.5 to 1 in 14.0) and dipping towards west and southwest direction. The eastern part of the area is generally having less gradient (1 in 14) as compare to remaining part of the block. The attitude of the seam is presented in floor contour plan.

5.5 FAULTS

The area of the block is traversed by 6 total numbers of faults. Most of the faults are oblique faults, cutting across the strike of the strata. The major i.e. F6-F6, F7-F7 & F8-F8 continuing from the northern adjoining block i.e. Kolgaon Sawangi Block and its fault numbers have been retained as mentioned in the geological report (Kolgaon Sawangi, May 1993) prepared by MECL. This major fault (F8-F8) also demarcates the western limit of the geological plan and floor positions of faults are shown in floor contour / iso-

parting/seam folio plans. The newly interpreted faults have been numbered i.e. F1-F1, F2-F2 & F3 & F3. For further details kindly refer Chp.-4, Pg. 11 & 12 of PR 07.10.2014.

6.0 MINE RESERVES

Considering flat seam, advantage of upthrown fault F7-F7 in dip side, good strike length and low stripping ratio an alternative proposing maximum evacuation of Coal Reserves from Mugoli Extension block is proposed. In proposed Alternative the coal reserves are 44.06 Mt at the stripping ratio of 3.67 m³/t upto 170 m quarry depth. These reserves are sufficient for getting moderate mine life with high annual production and so it has been considered for project planning. Reserves, overburden, depth & stripping ratio for given alternative is given in the Table below :

<u>TABLE NO 5: Quarry Boundaries</u>			
Rise Side / East Side	West side /Dip Side	South Side	North Side
Keeping Quarry floor at Incrop of bottom section at half thickness	Keeping Quarry Surface at 175m from Penganga river	Keeping Quarry floor over fault F8-F8(Upto GR limits)	Keeping Quarry floor at Incrop of bottom section at half thickness

BREAKUP OF MINEABLE RESERVES

TABLE NO 6: Summary of Coal Reserves as per approved PR (2014)

Sl. No.	Particulars	Reserves (Mt)
1.	Net Geological reserves in Mugoli Extension Block	54.898Mt
2.	Left out Net Geological reserves in Mugoli Extension block in half incrop, and river side area	5.948 Mt
3.	Net Geological reserves in Quarriable area	48.95Mt
4.	Net Mineable reserves in proposed Quarry area	44.06 Mt

1. MINE TARGET

The annual target production for the mine as per the approved PR (2014) is 4.0 MTPA for mineable reserves of 44.06 MT. However the peak capacity of the Project is 4.50 MTPA for which EC has been secured. The mine has started production in 2015-16 and is likely to achieve the EC capacity of 4.50 MT in 2018-19. Since the mine has the potential as well as the reserves for enhancement of capacity within the existing setup

(without any capital investment) therefore, considering the increased demand of power sector it is proposed to enhance the target by 40% i.e from 4.50 MTPA to 6.30 MTPA.

2. MINE LIFE

As per the approved PR (Oct'2014), the life of the project works out to 15 years (including initial one year for land acquisition). The mine has started the coal production in the year 2015-16 & considering the enhance capacity of 6.30 MTPA the balance life would be **7 years** from 2018-19.

TABLE NO 7: YEARWISE COAL PRODUCTION & OB REMOVAL PROGRAMME

SL. No	Year	Coal Production (MT)	OB Removal (Mm3)		
			HOE	Dept (Considering as on date capacity)	Total
1	2015-16	1.05 (Actual)	2.03	0.00	2.03
2	2016-17	2.70 (Actual)	2.40	0.00	2.40
3	2017-18	3.70 (Actual)	4.74	1.19	5.93
4	2018-19	4.50	14.72	1.85	16.57
5	2019-20	6.00	20.82	1.92	22.74
6	2020-2021	6.30	22.24	1.84	24.08
7	2021-2022	6.30	24.15	1.80	25.95
8	2022-2023	6.00	24.01	1.80	25.80
9	2023-2024	5.00	24.01	1.44	25.46
10	2024-2025	2.51	12.18	0.63	12.81
	Total	44.06	151.30	12.47	163.77

3. GRADE OF MINEABLE COAL

As per the approved PR (Oct'2014), the Grade of Quarry Coal without dilution is 'G'10 with GCV of 4551 k.cal/kg after removing of major partings.

As per the approved PR (Oct'2014), the seam characteristics and the profile of the quarries are as given below in table:-

TABLE NO 8 :SEAM CHARACTERISTICS & MINE PROFILE

SI.No.	PARTICULARS	
1	Area of the Quarry	
(a)	On floor (ha)	174.95
(b)	On surface (ha)	240.10
2	Average strike length (m)	1050
(a)	Maximum	1550
(b)	Minimum	550
3	Average width (m)	
(a)	At floor	700
(b)	At surface	850
4	Depth (m)	
(a)	Initial	20
(b)	Final	170
5	Gradient of seam	1 in 7.5 to 1 in 14
6	Average thickness of seam /partings (m)	
(a)	Section A	1.50
(b)	Parting P1	1.0
(c)	Section B	3.0
(d)	Parting P2	1.2
(e)	Section C	2.75
(f)	Parting P3	5.25
(g)	Section D	10.30
(h)	Total Av. Thickness considered (A+B+C+D)	17 m (approx.)
7	Average parting between sections (m) (between C &D)	3.0
8	Mineable reserves (Mt) as per approved PR (Oct'2014)	44.06
	Balance minable reserves (Mt) as on 1.04.2018	36.61
9	Total OB (Mm ³)	163.77
(a)	Top OB (Mm ³)	152.17
(b)	Parting (Mm ³)	9.60
(c)	BC Soil excavation from 120 m channel around the proposed periphery of the dump to ensure safety of dumps (Mm ³)	2.00
10	Average SR (m ³ /t)	3.67

SI.No.	PARTICULARS	
11	Grade &GCV	'G'10(4551)

7. LAND

The total requirement of the land for Penganga OC Project would be 763.06 Ha. Out of this land, the proposed land required for the project comprises of surrounding villages namely Wirur, Gadegaon, Borgaon & Sonarli. Land of these villages is mostly used for cultivation purpose. Cash crops like cotton, chillies etc are also grown apart from standard agricultural product like Rice, Wheat & Jawar. The break up of the type of land required for Penganga OC Project is as follows :

TABLE NO 9: LAND DETAILS

SI.No.	Particulars	Total Land (ha)
1	Tenancy land to be acquired	612.10
2	Government Land	131.73
3	Village rehabilitation	15.00
4	Land for Bridge	4.23
	Total	763.06

Rate of tenancy land and Govt. land has been considered as per R and R Policy 2012 of CIL i.e. MSGR 2012. In addition to the land cost, a compensation package for acquisition of land as per new R&R Policy, 2012 of CIL, has been also considered. As per the directives of Technical Sub-Committee of WCL, provisioning of monetary compensation in lieu of employment to 50% of land oustees to be considered for planning purpose. Hence the total cost of land, as per the directive of TSC including 50% monetary compensation package, works out to Rs.216.3948 crores.

Wirur village is located in proposed Quarry area and it is proposed to be shifted. Provision of Rs.41.8870 crores has been made for shifting and rehabilitation of Wirur village in the approved PR (Oct'2014).

As seen from the above, the approved PR of Penganga OC (Oct'2014) there is no forest land involved.

However, during acquisition process it has come to notice that there is 46.04 Ha of forest land involve in the project which falls partly in the tenancy land (15.15 Ha) & balance in Govt. Land (30.89 Ha).

Accordingly application for forest clearance was made & in principle/ Stage-I approval for 46.04 Ha of forest land has been accorded by Central Govt. Vide letter no. F.No 8-10/2018-FC dtd 18.05.2018. The land breakup now stands as below

TABLE NO 10: LAND DETAILS

Sl.No	Land Particulars	Within mine lease area (Ha)	Outside mine lease area (Ha)	Total (Ha)
1	Tenancy/ Agricultural land	596.95		596.95
2	Govt. Land including Gaothan land of Wirur village	100.84		100.84
3	Forest land	46.04		46.04
4	Land for resettlement of Wirur Village		15.0	15.0
5	Tenancy land for construction of bridge		4.23	4.23
	Total			763.06

As indicated above, the stage-I FC for 46.04 Ha of forest land involved in Penganga OC has been secured vide MoEF&CC letter dtd 18.05.2018. In the aforesaid clearance accorded it has been mentioned that

Quote

(iii) On analysis of DSS it is observed that the forest area within the lease area is 112 Ha and not 46.04 Ha. The entire area under the Mugoli extension block should be estimated and mapped and georeferenced map of forest and non forest land should be submitted before further mining activities in the Mugoli Extension Block. A committee under Nodal Officer dealing with FCA, the representative of WCL dealing with land records Revenue authority of the district and Conservator of forests in Regional office, Nagpur as representative of the ministry should be constituted to prepare the georeferenced map of Mugoli Extension Block and all type of forest lands (as per the definition of Supreme court order dtd 12.12.1996 in T.N Godavarman Vs Uol) falling within the Penganga OC mining project and submit the report to the ministry for consideration of FAC along with compliance report for final approval.

(iv) After delineation of entire forest area within Mugoli extension block developed as Penganga OC mining project, the application for the forest clearance of whole forest land within the coal block should be submitted for consideration of the FAC and the NPV for the entire forest land, as indicated by the committee, and as per the guideline dtd 01.04.2015 should be deposited by WCL along with compliance report for final approval.

Unquote

In this regard, it is mentioned that the job of delineation of entire forest land (as directed above) has been initiated. The nomination of WCL has already been communicated to statutory authorities.

As such, it is submitted that, the directions of MoEF&CC as recorded in stage-I FC dtd 18.05.2018 will be followed and complied with. It is pertinent to mention that the total land involve in the project activity/ML area of 743.83 Ha will remain same. Thus the total land involved is 763.04 ha.

7.1 ACQUISITION STATUS

Till date, the land in physical possession is 681.81 Ha. The breakup is as follows:

- a) Agricultural land- 585.416 Ha
- b) Govt. Land-96.394 Ha
- c) Total (a+b)– 681.81 Ha

Balance land to be taken in physical possession is as follows:

- d) Forest land - 46.04 Ha (stage-I FC has been obtained)
- e) Govt. land – 4.446 Ha (For Wirur village, Gawthan)
- f) Tenancy/ Agricultural land – 11.534 (Family dispute/ Court cases)
- g) Total (d+e+f) – 62.02 Ha
- h) Grand Total (c+g)- **743.83 Ha**

TABLE NO 11 : Status of Rehabilitation of Land Outsees

Nos. of land holdings	514
Nos. of land outsees provided employment	410
Nos. Of land outsees given monetary land compensation	63
Balance	41

Amount of compensation paid against the land including tribunal	Rs 115.78 Cr. Balance Rs 4.75 Cr.
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TABLE NO 12: Break up of proposed land use during mining

Sl. No.	Particulars	Land (in ha)
a)	Total Excavation area	240.10
b)	Proposed External OB Dump	253.60
c)	Infrastructure & Bridge	26.23
d)	Village rehabilitation	15.00
e)	Approach roads / Embankment	95.30
f)	For rationalisation of boundary/Blasting zone	132.83
	Total	763.06

The present land use is as follows:

1. Excavation Area - 55.06 Ha
2. External OB dump area - 34.04 Ha
3. Embankment area - 46.80 Ha
4. Infrastructure Area incl. Roads etc .- 4.07 Ha
5. Balance Excavation Area - 185.04 Ha
6. Balance External OB dump Area - 219.56 Ha
7. Balance Rationalization/Blasting Area etc. -132.83 Ha
8. Balance land for Infrastructure - 17.93 Ha
9. Balance land for Approach road /Embankment - 48.50 Ha

Total – 743.83 Ha

The land outside mine lease area of 19.23 Ha comprising village rehabilitation site of 15.00 ha and land for construction of bridge of 4.23 Ha are falling outside the mine lease area and out of that 15.00 Ha is yet to be acquired. 4.23 Ha tenancy land has been acquired that has been used for construction of bridge. The change in total land involved in the project from 781.0 ha (EC) to 763.06 ha (present proposal) has been duly communicated to MoEF&CC vide letter no वेकोली/मुख्यालय/पर्यावरण/10J/899 dated 30.07.2018. A copy of the same is attached herewith in Annexure-XIII.

8. MINING STRATEGY

As per the approved project report, the top OB is proposed to be removed by departmental equipments (Hydraulic excavator + Dumper combination) and parting & the balance OB by Hiring of equipments. The coal is proposed to be extracted by

surface miner on hiring basis. At present there is 01 no. of surface miner deployed in the mine for coal on hiring system.

8.1 SEQUENCE OF MINING

The total average strike length of proposed Penganga OC is about 1.05 km. Since the gradient of seam is flat, mining cuts are proposed such that substantial internal backfilling of OB upto surface and heightening of OB dump over quarry area and merging it with proposed external OB dump can take place.

8.2 WASTE DISPOSAL

About 22 Mm³ of OB is of Soft OB and soil in the proposed quarry and rest about 139.77 Mm³ is hard strata. To provide stability of dumps and prevent slope failures, it is proposed to have separate dumps for Soft OB, Black cotton soil and hard OB. 90m, 45m and 10m height has been proposed for hard OB, Soft OB and Black cotton soil respectively. As per directive of TSC to remove BC soil below the site of proposed external dump area it is proposed to excavate 120 m channel of entire BC soil (upto 3m depth) in the circumference of proposed Rise side Hard OB and soft OB dumps to ensure safety and stability of dump based on the latest study done by CMPDI (Hq.) for external dumping of OB above BC soil in one Project of WCL. Therefore additional 2.0 Mm³ of BC soil from the place of proposed hard OB dump and soft OB dumps is excavated and dumped in the BC soil dump (2.0 Mm³). External OB dump, *proposed* is made of 15 m dump tier keeping berm of 6 m at 15 m height, berm of 30 m at 30 m height and again, a berm of 6 m at 45 m height. Keeping the previous bench pattern, the final angle of slope comes out to be about 24° for hard OB dump and 25° for Soft OB dump.

TABLE NO 13: Break-up of quarry-wise OB dumping

Quarry	Total OB (Mm ³)	External OB Dump (Mm ³)				Internal OB Dump (Mm ³)	
		Emb ankm ent	Extern al OB Dumps of Soft OB and Black cotton soil	External OB Dump of hard OB (with 0.5 Mm ³ spreadin g of BC Soil)	External OB Dump of hard OB with merging of internal dump	Internal OB Dump	Extensio n of OB Dump over internal backfillin g

					heightening		
OB	161.77	7.50	22.00	62.00	17.0	42.80	10.47
BC Soil excavation from 120 m channel around the proposed periphery of dumps to ensure safety of dumps	2.0	0	2.00	0	0	0	0
Total	163.77	7.50	24.00	62.00	17.0	42.80	10.47

TABLE NO 14: Break up of Internal & External Dump (Year wise)

Year	External	Internal	Total
2015-2016	2.03	0.00	2.03
2016-2017	2.40	0.00	2.40
2017-2018	5.93	0.00	5.93
2018-2019	14.57	2.00	16.57
2019-2020	19.74	3.00	22.74
2020-2021	21.08	3.00	24.08
2021-2022	22.95	3.00	25.95
2022-2023	21.80	4.00	25.80
2023-2024	0.00	25.46	25.46
2024-2025	0.00	12.81	12.81
TOTAL	110.50	53.27	163.77

Total External dumping – 110.50 Mm³

Total Internal dumping - 53.27 Mm³ and percentage of Internal backfilling is about 33%. Internal OB dumping of hard OB after cut-3 starts from 4th year of Quarry operation. Entire Soft OB and BC Soil of Quarry and that of 120 m channel (in the place of OB dumping area which is about 2.0 Mm³) is 24.50 Mm³ and about 24.00 Mm³ is dumped in separate External OB Dumps of Soft OB and BC Soil dump with 45 m and 10 m height respectively and remaining 0.50 Mm³ is spreaded over external OB Dump for plantation activity. It is proposed to fill the void Quarry upto surface keeping 30 m bench height and 37° slope. In internal backfilling, final angle of slope is about 23° (refer Post-

mining Land Use Plan). About 33 % of Total OB is proposed to be internally backfilled. It is proposed that total parting OB will be internally backfilled .

As on 31.03.2018, total OB excavation is 10.36 Mm³ out of which OB accommodated in embankment is 3.70 M m³ and dumped in external OB dump is 6.66 Mm³.

For balance life, the distribution will be as follows:

Total OB to be excavated (as on 1.04.2018)-153.41 Mm³

Total OB in external Dump – 100.14 Mm³

Total OB in internal dump – 53.27 Mm³

9. MANPOWER

The Manpower deployed in the mine (as on date) is as follows:

- Nos. of Executive- 33
- Nos. of Monthly rated – 86
- Nos. of Daily rated -341

10. DISPATCH ARRANGEMENTS

The coal evacuation at Penganga OC Mine is done through contractual agency from Face to Ghugus siding. The Surface miner is deployed in the mine for cutting the coal without and produces -100 mm size coal which is transported through tippers loaded by payloaders directly to Ghugus Railway siding from there the coal is transported to different thermal Power stations by Rail mode. Restricted Quantity of coal i.e. 20% is Stocked at Coal stock yard for Local Consumers , which uses tippers for transportation of coal.

In future, the coal excavated by surface miner from quarry will be received into the 6 x 150t capacity hopper near quarry mouth by means of rear discharge dumpers/Trucks as given in PR 2014.

11. SAFETY

The project report has been drawn in conformity with the prevailing statutory provisions as per Mines Act, 1952 and CMR, 1957 applicable for safety in Opencast Mines. However, all statutory rules, regulations, applicable laws etc. and statutory requirement related to Govt. licences , workers compensation, Insurance, etc. shall have to be adhered to. All the regulations & schedules of Coal Mines Regulations, 1957 and

subsequent amendments relating to opencast mining have to be adhered to and implemented in order to maintain day to day safety precautions as per statute.

11.1 SAFETY ASPECT FOR BLASTING OPERATIONS

As explosives are required in bulk for blasting in OC mines, provision of regulation - 164 A of CMR 1957 should be ensured.

All blasting operations shall be carried out in day light. Suitable precautions shall be taken as per statute before and after blasting operations. Controlled blasting technique has to be practised to minimise fly off rocks and ground vibrations and keep them within safe limits. In order to keep the ground vibrations within the permissible limit as per DGMS Circular No. 7 of 1997, to avoid flying of rock fragments and also to achieve satisfactory blasting results, optimized drilling / blasting parameters depending upon rock formation using combination of relays / delays will have to be evolved. It is further recommended that at the time of actual execution, proper study for controlled blasting and ground vibration is done with scientific body in order to evolve site specific charge distance relationship.

11.2 SAFETY ASPECTS FOR OUTSOURCING/HIRING OF MACHINERIES

Special precaution should be taken while deploying workers in the mine. Before employing any labour to the mine proper vocation training should be imparted and recommendations of Recent Safety Conference should be strictly followed. Terms and conditions shall be fixed by management for deployment of labours by leaser of machineries. Before deploying workers they must be trained and briefed about safety aspects in opencast mine. However during course of execution of the work, if any accident occurs whether major or minor, the matter shall have to be immediately informed to mine management i.e, Colliery Manager/Agent/GM of Area so that Notices of accidents in accordance of Reg. 9 of CMR 1957 (subsequent amendments) and Sector 23 of Mines Act 1952 may be given and other necessary steps may be taken in accordance of Section 23 of Mines Act ,1952 & Reg. 9 of CMR ,1957 (subsequent amendments) and other relevant laws.

12. Environment Pollution control measures

To control air pollution following arrangements have been made

1. Dust suppression measures- By mobile tankers 2 Nos. of 28 KL departmental

- equipment and 3 nos. of 16 KL and 1 no. of 12 KL by hiring.
2. All the trucks carrying coal are covered with tarpaulin.
 3. In 2017-18, 500 saplings has been planted in office and service building premises. In 2018-19, 25000 nos. saplings are being planted on plain area as well as on slopes of embankment.
 4. To control Water pollution, a sedimentation pond of size 23 m *11 m *1.5 m has been put in to operation.

13. Mine Closure Planning

13.1 General

Mine closure planning has to be carried out at the starting of the mine and needs periodic reviewing and revision during its life cycle to cope with the geo-technical constraints, safety and economic risks, social & environmental challenges. For the Mine Closure activities, a corpus fund is created by opening an escrow account with the coal controller organization in nationalised bank. For opencast mine, an amount @ Rs 6.00 lakhs per Ha of the project area is required to be deposited in this account for final mine closure. The above rate has been adopted as per Circular No. 55011-01-2009-CPAM, GOI, Ministry of Coal, dated 27 August 2009.

In the PR of Penganga OC (4.0 MTPA) approved on 27.09.2014, the total corpus of closure cost has been worked out for 763.06 Ha land including 15.0 Ha land for rehabilitation of Wirur village, which is detailed below:

TABLE NO 15: DETAILS OF MINE CLOSURE COST

Sl No	Details	Qty
1	WPI for All Commodities for Aug 2009	129.6
2	WPI for All Commodities for June, 2014 (Provisional)	182.6
3	Ratio of WPI =(2) / (1)	1.409
4	Total land area requirement for the project (ha) =	763.06
5	Mine closure cost @ Rs 6 lacs/ha (Rs in Lakhs) =	4578.36
6	Mine closure cost after indexing as on June'2014 (Rs. In Lakhs) = (5) x (3) =	6450.68
7	Life of Penganga OC mine in years (revenue life)	14
8	Annual Contribution to Escrow fund as on 2014-15 (Rs in Lakhs) = (6) / (7) =	460.76

Sl No	Details	Qty
9	Annual Contribution to Escrow fund as on 2015-16 with 5% Escalation (1st year of Closure Cost Deposit) (Rs in Lakhs) = (7) / (8) =	483.80

Based on the above, annual Mine Closure cost has been submitted in the Escrow A/c as detailed below :

Sl. No.	Year	Mine Closure Amount To Be Deposited with 5% Escalation (Rs. In Lakhs)	Actual Amount Deposited in Escrow A/c (Rs. In Lakhs)
1	2014-15	-	0.50
2	2015-16	483.80	483.30
3	2016-17	507.99	507.99
4	2017-18	533.39	533.39
	Total	1525.18	1525.18

As per the present Mining Plan (July, 2018) for 6.3 Mty Peak capacity, the Mine Closure Corpus has been re-assessed for revised Mine life of 7 years as on 01.04.2018 after making adjustment for the mine closure amount already deposited in the Escrow Account upto 31.03.2018. Since, 15 ha land is proposed for rehabilitation of village which is to be acquired outside the mine lease area and exact location of land is not determined, hence, this 15 ha land has been excluded for the purpose of Mine Closure Corpus estimation. The details are tabulated below :

TABLE NO 16: DETAILS OF MINE CLOSURE COST

Sl No	Details	Qty
1	WPI for All Commodities for Aug 2009 (New Series)	83.02
2	WPI for All Commodities for April, 2018 (New Series)	116.80
3	Ratio of WPI =(2) / (1)	1.4068
4	Total land area requirement for the project (ha) =	748.06
5	Mine closure cost @ Rs 6 lacs/ha (Rs in Lakhs) =	4488.36
6	Mine closure cost after indexing as on April, 2018 (Rs. In Lakhs) = (5) x (3) =	6314.63

Sl No	Details	Qty
7	Mine Closure Corpus already deposited upto 31.03.2018 (Rs. In Lakhs)	1525.18
8	Balance Mine Closure Corpus To be Deposited in Escrow A/c (Rs. Lakhs) = (6) – (7) =	4789.45
9	Life of Penganga OC mine in years	7
10	Annual Contribution to Escrow fund as on 2018-19 (Rs in Lakhs) = (8) / 9) =	684.21

Based on the above, annual Mine Closure cost will be deposited every year with 5% escalation which is as follows:

Sl. No.	Year	Mine Closure Amount To Be Deposited with 5% Escalation (Rs. In Lakhs)
1	2018-19	684.21
2	2019-20	718.42
3	2020-21	754.34
4	2021-22	792.06
5	2022-23	831.66
6	2023-24	873.24
7	2024-25	916.90
	Total	5570.83

TABLE NO 17: Activity wise break-up of Closure Cost

Total mine closure corpus (excluding interest)= Rs.1525.18 Lakhs (UPTO 31st

March,2018)+ Rs.5570.83 Lakhs=Rs.7096.01 lakhs

Sl.No.	Activity	% of Total Mine closure Cost	Amount (Rs.in crores)
A	Dismantling of structures		
	Service Building	0.2	14.19
	Residential Building	2.67	189.46
	Industrial Structures like CHP,Workshop,Field substation, etc.	0.3	21.29
B	Permanent Fencing of mine void and other dangerous area		
	Random rubble masonry of height 1.2 meter including leveling up in cement concrete 1:6:12 in mud mortar	1.5	106.44
C	Grading of highwall slopes		
	Levelling and grading of hiwall slopes	1.77	125.60
D	OB Dump Reclamation		
	Handling/Dozing of external OB Dump into mine void	88.66	6291.32
	Bio-reclamation including soil spreading,plantation and maintenance	0.4	28.38
E	Landscaping		
	Landscaping of the clear land for improving its esthetic	0.3	21.29
F	Plantation		
	Plantation over area obtained after dismantling.	0.5	35.48
	Plantation around the fencing	0.2	14.19
	Plantation over the cleared off external OB Dump	0.02	1.42
G	Monitoring/Testing of Parametrs for three years.		
	Air Quality	0.22	15.61
	Water Quality	0.2	14.19
H	Entrepreneurship development (vocational/ skill development) Training for sustainable income of affected people.	0.26	18.45
I	Miscellaneous and other mitigative measures.	2	141.92
J	Man power cost for supervision	0.8	56.77

TOTAL	100%	7096.01
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13.2 BREAK-UP OF CLOSURE FUND FOR VARIOUS CLOSURE ACTIVITIES

Mining is to be carried out in a phased manner initiating afforestation / reclamation work in the mined out area of first phase while commencing mining in the 2nd phase.

Upto 80% of the total deposited amount including interest accrued in the ECSROW account may be released after every 5 years. The amount released should be equal to expenditure incurred on Progressive Mine closure in past 5 years or 80% whichever is less.

The above cost/expenditure will be met from the corpus fund deposited in the escrow account by the mine operator. However, the additional amount beyond the escrow account will be provided by the mine operator after estimating the final mine closure cost (as per the mine closure guideline).

The amount indicated separately under each head in the above table is indicative only and based on actual expenditure the amount may change.

14. CONCLUSION

WCL board in its in its 303rd meeting held on 24-08-2018 deliberated on the above mining plan and approval of WCL Board has been secured vide letter no WCL/BD/SECTT/BM-303/2018/429 dated 03-09-2018.
