

**STRICTLY RESTRICTED
FOR COMPANY USE ONLY**

The information given in this report is not to be communicated either directly or indirectly to the press or to any person not holding an official position in the CIL/ Government.

CENTRAL COALFIELDS LIMITED (CCL)

MINING PLAN AND MINE CLOSURE PLAN OF SELECTED DHORI (LOWER) OPEN CAST MINE (PROJECT AREA-211.82 HA, RATED CAPACITY-2.0MTY)

EAST BOKARO COALFIELD

DIST – BOKARO (JHARKHAND)

[TEXT & PLANS]

NOV 2021

**REGIONAL INSTITUTE-III
CENTRAL MINE PLANNING & DESIGN INSTITUTE LIMITED
(A Subsidiary of Coal India Limited)
GONDWANA PLACE, KANKE ROAD, RANCHI – 834 008,
JHARKHAND, INDIA**

INDEX OF CHAPTERS OF THE MINING PLAN (INCLUDING MINE CLOSURE PLAN)

Sl No.	Chapters	Page No
	Summarized Data	4-7
Chapter 1	Project Information	8-11
Chapter 2	Exploration, Geology, Seam Sequence, Coal Quality and Reserve	12-19
Chapter 3	Mining	20-26
Chapter 4	Safety Management	27-36
Chapter 5	Infrastructure Facilities proposed and their Location	37-38
Chapter 6	Land Requirement	39-40
Chapter 7	Environment Management	41
Chapter 8	Progressive & Final Mine Closure Plan	42-44

LIST OF PLATES

Sl. No.	Particulars	Scale
MINING		
1.	Final Stage Quarry Plan	1: 4000
2.	Quarry Cross-Section along A-A', B-B', C-C'.	1: 2000
3.	Final Stage Dump Plan	1: 4000
4.	Key Land use Plan	1: 4000
5.	Post Mining Land Use Plan	1: 4000

SUMMARISED DATA

Sl. No.	Particulars	Unit	Value
A.	GENERAL		
1	Name of Project		Selected Dhori(lower) OCM
2	Name of Area / Company		Central Coalfield Ltd.
3	Nearest Railway Station from project	Name	Phusro Railway Station
		km	2
4	Nearest National / State Highway / Approach Road	Name	NH 2 / Dumri-Bermo-Jaina road
		km	35 / 4

B.	GEOLOGICAL		
1	Name of geological blocks considered	Name	Selected Dhori
2	Area of the geological blocks	sq. km	3.00
3	Borehole Density within blocks	BHs / sq.km	9
4	Description of all coal seams within block		

Stratigraphic Sequence	Thickness (m)	Net Geological Reserves (MT)	Remarks
Comb. Karo Gr. of seams Karo VI to X	57.33-69.28	85.17	Under exploitation, not considered.
Karo V	2.92-4.93	7.01	Reserve not assessed in Geological Report
Karo IV	0.18-1.15	-	Reserve not assessed due to low thickness.
Karo III	3.25-7.66	12.75	
Karo II	0.17-1.25		Not opencastable due to low thickness.
Karo I	0.30-0.40		Not opencastable due to low thickness.
TOTAL (Geological reserve considered for mining)		19.76	

Note: Reserves of Seams Karo V & III has only been considered.

Sl. No.	Particulars	Unit	Value
C.	TECHNICAL		
1	Area of the proposed mine block (only the quarry area)	sq. km	1.79
2	Borehole density within mine area	BHs/sq. km	12.5
3	Mine parameters		
	Extent along strike (min. – max.) Extent along dip (min. - max.)	m	600 – 1300 800 – 1450
4	Description of coal seams proposed to be worked along with the parting details		

Name of seam/ Parting	Thickness range considered (m)	Av. Thickness / Parting Thickness (m)	Avg Grade	Mineable Reserve (MT)	Volume of OB (Mcum)
Rehandling OB	3.00 – 48.50	12.20			12.34
Seam VI to X combined	57.33-69.28	-	W III/IV	_*	
Parting V - VI to X	10.20 - 30.25	17.40			32.85
V	0.15 - 5.04	2.00	G 9	4.51	
Parting IV - V	5.34 – 14.15	17.80			20.81
IV	0.10 - 1.30				
Parting IV - III	4.40 – 5.10				
III	1.50 - 7.22	3.50	W III	6.21	
Total Coal OB				10.72	66.00

* Karo VI to X combined has been considered for mining. This seam forms the topmost seam in the proposed mining area. The seam has been mined extensively with an occurrence of fire in the area. Presence of this seam is possible in patches in the proposed mining area. Since its extent and quantity could not be ascertained due to past mining, balance reserve of this seam has not been assessed. However, the same needs to be mined out along with the underlying seams Karo V & III.

Sl. No.	Particulars	Unit	Value
5	Av. Stripping Ratio	m ³ /te	6.16
6	Method of Mining		By Shovel Dumper Combination
7	Target Output	MTY	2.00
	Production capacity (at 125%)	MTY	NA
8	Year of achieving Target Production	Year	4 th
9	Year of start of Internal Dumping	Year	1 st

10	Production Phasing (date upto target year)			
Year	1	2	3	4
Coal (MT)	0.50	1.00	1.50	2.00
OB (Mcum)	3.70	7.41	10.18	12.36

11	Total Mine Life	Years	8
	Production build-up period	Years	3
	Production period	Years	3
	Tapering / mine closure period	Years	2
12	Major HEMM Deployed (Max)	Unit	No.
	Diesel Hydraulic Shovel	10-12 Cum	2
	Diesel Hydraulic Shovel	5.5-6.5 Cum	2
	Diesel Hydraulic Backhoe	4.3-5.0 Cum	1

	Rear Dumper	100 T	12
	Rear Dumper	60 T	14
	Diesel RBH Drill	250 mm	1
	Diesel RBH Drill	160 mm	3
	Dozer	410 HP	3
	Dozer with Ripper Attachment	410 HP	1

Sl. No.	Particulars	Unit	Value
13	Seam-wise weighted average grade of coal (non-coking/coking)	Non-Coking /Coking	Grade
	Seam V	Non-Coking	G 9
	Seam III	Coking	W III

Sl. No.	Particulars	Unit	Value
14	Presence of Major Surface Constraints (nallas, road, power line, etc.)	Nalas & Nadi	Tisri Nala, Joria Nala, public road & existing mine workings.
15	Coal Transport within the mine (In-pit belt conveying system or by Truck)		Dumper
16	Surface Coal Transport to Siding/Despatch Point and Mode of Despatch		By conveyors from CHP to bunkers, mechanized loading through Hopper at Tarmi siding.
17	Any Railway Siding and distance		Tarmi railway siding at Bhandaridah Railway station is about 1-2 km away
18	Name of any Specific Customer/Industry		Basket linkage

D.	ENVIRONMENTAL & OTHERS
-----------	-----------------------------------

Sl. No.	Particulars	Unit	Value
1	Total Land required		211.82
	Land acquired		211.82
	Total Land to be acquired	Ha	Nil
	Non-Forest land		Nil
	Forest land		Nil
2	Land to be acquired within minetake area (excavation area)		Nil
	Non-Forest land	Ha	
	Forest land		

Sl. No.	Particulars	Unit	Value
3	Land to be acquired outside minetake area (Beyond Excavation Area, such as Approach Road, Infrastructure, Colony, nala diversion etc.)	Ha	0.00
4	Land to be acquired for external dumping	Ha	0.00
5	Habitation & Rehabilitation No. of villages within mine boundary No. of PAFs to be rehabilitated	Nos.	0 0
6	Drainage of the Area (Name of river/nala)		North-south flowing Tisri Nala & Joria Nala discharging to West to east flowing Damodar River.

CHAPTER 1: PROJECT INFORMATION

	<i>Parameters</i>	<i>Details</i>
1.1	INTRODUCTION	
1.1.1	Name of Coal Block	Selected Dhori
1.1.2	Name of the Coalfield	East Bokaro Coalfield
1.1.3	Base date of Mining Plan/ Mine Closure Plan	Nov 2021
1.1.4	Linked End Use Plant	Basket
1.1.5	Distance of End use plant from the pit head of the project in “km”	1.0 km
1.1.6	Mode of Coal Transport	Road/ Railway

1.2 LOCATION, TOPOGRAPHY AND & COMMUNICATION

1.2.1	Location of coal deposit (District and State)	District - Bokaro , State - Jharkhand
1.2.2	Communication: PWD roads, railway lines, Air	Selected Dhori OCM is well connected by rail and road. The Gomoh-Barkakana loop line of the Eastern Railway passes adjacent to the area. The nearest railway Station 'Phusro' on the Barkakana-Gomoh loop line is about 2 km to the west of the area. The area is well connected by an all-weather Phusro-Dumri metalled road up to the existing Tarmi opencast project of CCL. The block is about 30km from Bokaro, about 80km from Dhanbad & about 110km from Ranchi. The nearest commercial airport is situated at Ranchi.
1.2.3	Availability of power supply	It is envisaged that this project will receive power at 33 kV from Bokaro Thermal Power Station (BTPS) of DVC. For this, two nos. existing 33 kV overhead lines from BTPS to B&K Main-sub-station shall be extended up-to proposed quarry.
1.2.4	Prominent physiographic features, drainage pattern, natural water courses, rainfall data, highest flood level	The area witnesses a sub-tropical climate. The average temperature varies from 43° Celsius to 49° Celsius during summer and 4° Celsius to 10° Celsius during winter. Heavy rainfall occurs in the month of June to September. The average rainfall varies from 1200-1400mm of rainfall / annually. The area is hilly with isolated hillocks and intervening plain lands and valleys occupied by paddy fields, quarters and dumps of some existing and abandoned quarries. The river Damodar serves as the perennial source of water for the area. The Tisri Nala, a prominent tributary of Damodar, flows from north to south to the west of the area.
1.2.5	Important surface features within the project area and	North-south flowing Tisri Nala & Joria Nala discharging to West to east flowing Damodar River.

	Parameters	Details
	major diversion or shifting involved	

1.3 DETAILS OF THE ALLOTMENT AGREEMENT

1.3.1	Name the Allottee	-NA-
1.3.2	Details of allotment/vesting order	-
1.3.3	Name and address of the applicant	-
1.3.4	Name of the Previous allottee of the Block	-
1.3.5	Starting Date of the Mine as per CMDPA	-
1.3.6	Rated Capacity as per CMDPA	-
1.3.7	Production Schedule as per opening permission (meeting provisions of CMDPA if any)	-
1.3.8	End Use of Coal as per allotment order if any	-
1.3.9	Cardinal Points co-ordinates of the Block boundary	-

1.4 DETAILS OF THE PREVIOUS APPROVAL OF MINING PLAN

1.4.1	Date of Approval	04.11.2019				
1.4.2	Conditions, if any	-				
1.4.3	Scheduled year of start of production	1 st Year				
1.4.4	Proposed year of achieving the targeted production	5 th Year				
1.4.5	Date of actual commencement of mining operations, if operations already started	-				
1.4.6	Likely date of mining operations, if operations not yet started & reasons for non-commencement of operations	-				
1.4.7	Planned production and actual levels achieved in last 3 years (Coal in Mte, OB in MM ³ , SR in MM ³ /te)	Year wise Production Details				
		Year	Coal “Mte”	OB MM ³		Total OB
				Solid	RH	
		2018-19	3.504	0.681	0.085	0.766
		2019-20	2.216	-	1.502	1.502
		2020-21	1.590	-	2.026	2.026

	Parameters	Details
1.4.8	Reasons for difference between the planned and actual production levels	-

1.5 PARAMETERS OF APPROVED MINING PLAN VIS-À-VIS PROPOSED MINING PLAN

		Approved Mining Plan	Proposed Mining Plan
1.5.1	Block Area in “Ha”	211.59	179.44
1.5.2	Block Area Projectised “Ha”	211.59	179.44
1.5.3	Lease area “Ha”	-	-
1.5.4	Project Area “Ha”	264.85	211.82
1.5.5	Life of the Project “Yrs”	11	8
1.5.6	Minimum and Maximum Depth of working “m”	25 m-146 m	10 m-120 m
1.5.7	Net Geological Block “Ha”	300	300
1.5.8	Production Target “MTPA”	2.0	2.0
1.5.9	Seams Available “As per GR”	Top to bottom 1. Karo VI to X combined 2. Karo V 3. Karo IV 4. Karo III 5. Karo II 6. Karo I	Top to bottom 1. Karo VI to X combined 2. Karo V 3. Karo IV 4. Karo III 5. Karo II 6. Karo I
1.5.10	Seams not considered for Mining with Reasons	Seam IV, Seam II and Seam I. These seams are not mineable due to very low thickness. Karo VI to X combined has been considered for mining. This seam forms the topmost seam in the proposed mining area. The seam has been mined extensively with an occurrence of fire in the area. Presence of this seam is possible in patches in the proposed mining area. Since its extent and quantity could not be ascertained due to past mining, its reserve has not been assessed. However, the same needs to be mined along with the underlying seams.	
1.5.11	Gross Geological Reserve “Mt”	-	-
1.5.12	Net Geological Reserve “Mt”	27.81	19.76 Mt
1.5.13	Blocked Reserve “Mt”	-	9.04 Mt
1.5.14	Mineable Reserve “Mt”	16.83 Mt	10.72 Mt
1.5.15	Extractable Reserves “Mt”	16.83 Mt	10.72 Mt
1.5.16	% of Extraction/ recovery	100%	100%
1.5.17	Reserve Depleted (till the base date) Reserves “ Mt”	Nil	Nil

	Parameters	Details	
1.5.18	Balance Extractable reserve “Mt”	16.83	10.72 Mt
1.5.19	Average Grade	Grade –‘W-III’ for Karo Seam –III and ‘G9’ for Karo Seam-V	
1.5.20	OB in MM3	117.28	66.00
1.5.21	SR MM3/te	6.97	6.16
1.5.22	Mining Technology	Shovel-dumper mining system has been envisaged for working this OC mine.	
1.5.23	Coal Beneficiation envisaged	Part coal (coking coal) to nearby Washery	
1.5.24	Handling of Rejects		
1.5.25	Land use pattern “ Ha”		
1.	Excavation Area	211.59	179.44
2.	External Dump	-	-
3.	Safety Zone/Green Belt	29.76	24.15
4.	Other Use (Nala, embankment)	-	3.17
5.	Infrastructure area (CHP, Haul Road, Colony)	23.50	5.06
	Total	264.85	211.82
1.5.26	Reasons for revision		
As per Approved Mining Plan of Selected Dhori OCP (for extraction of lower Seams) (02 MTPA/264.85Ha) some part of Project Area comes under GM-JJ land. The GM-JJ land has not been acquired till date. Therefore, this mining plan has been prepared excluding un-diverted GM-JJ land. So mining plan of Selected Dhori (for extraction of lower Seams) has been revised (02 MTPA/211.82 Ha) for approval from competent authority.			

CHAPTER 2: EXPLORATION, GEOLOGY, SEAM SEQUENCE, COAL QUALITY AND RESERVE

	<i>Parameters</i>	<i>Details</i>	
2.1	DETAILS OF THE BLOCK		
2.1.1	Particulars of adjacent blocks: North, South, East, West	North: N.A South: Pichri Block	East: Tarmi Block West: Tisri Block
2.1.2	Location of the Block District / State	District- Bokaro State- Jharkhand	
2.1.3	Area of the Block “Ha”	300	
2.1.4	Area of the geological block projectized “in Ha” (Area of the geological block considered for liquidation of coal reserve)	211.82	
2.1.5	Balance area yet to be projectized “Ha”	-	
2.1.6	Likely Reserve in the area yet to be projectized “Mte”	-	
2.1.7	Cardinal Point Co-ordinates of the non-coal/lignite bearing area/ <u>existing mining lease</u> outside the allotted Geological Coal/Lignite block (Duly certified in line with para 1.9 of the Guideline, if fresh innig lease required)	This project is bounded by the latitudes 23°45'N to 23°48'N and longitudes 86°02'E to 85°03'E and lies in the Survey of India Topo sheet No. 73 I/1 (RF 1:50,000).	
2.1.8	Certificate of Qualified person/ Accredited Mining Plan preparing agency (MPPA) if the project area is confined within the vested/allotted block boundary/ <u>existing mining lease</u> and Where the project area extends beyond the block boundary, a certificate of Qualified person/ Accredited Mining Plan preparing agency (MPPA) should be supported with a certificate of State Government mines and Geology department must be attached, which should specify (a) intent of the state government for grant of lease beyond the vested geological boundary; (b) non-existence of Coal/ Lignite in the area beyond the vested/allotted geological block boundary/ <u>existing mining lease</u> to rule out the issue of encroachment and use of coal bearing area (beyond the vested/allotted block boundary/ <u>existing mining lease</u>) in the mining plan	-	

	Parameters	Details
	The Project area, Lease area and geological block area in “Ha” shall also be envisaged.	
2.1.9	KML file of the Proposed lease area, Project Area and geological block.	Enclosed as Annexure-
2.1.10	Whether the proposed project area is confined within the allotted block boundary/ existing mining lease , if not, the reason for deviation from allotted block boundary, may be given.	Yes
2.1.11	If the project area extends outside the allotted block boundary/ existing mining lease , confirmation about non-occurrence of coal/lignite in the area under reference needs to be furnished	-
2.1.12	Type of the Project (Operating / under Implementation) and year of Starting.	Under operation since nationalization
2.2	EXPLORATION, GEOLOGY AND ASSESSMENT OF RESERVE	
2.2.1	Regional geological set up of the area, local geology, structure, stratigraphic sequence, characteristics of the lithological units (coal seams /partings/overburden).	Regional Stratigraphy: The block structurally forms a part of the northern limb of the east west elongated synclinal sub basin of the East Bokaro Coalfield. The general strike of the strata is east west dipping southerly at angles varying from 7° to 12°. However, the strike of the beds changes from NW-SE in the east to NE-SW in the west through E-W in the central part. The Gondwanas are represented by rocks of Talchir, Karharbari and Barakar Formations. Post Barakar formations are absent in the block. Talchir Formation: The Talchir Formation is developed in the northern part of the block and occurs as narrow strip. It comprises of pebbly sandstone, conglomerate and fine grained sandstones with laminated greenish shale. Karharbari Formation: The Karharbari Formation lies conformably above the Talchirs. Exposures of the Karharbaris are found in the northern part. It is represented by coarse to very coarse grained sandstone with gritty layers and thin coal seams (Karo-I to IV). Among the thin seams found in the Karharbari Formation, the Karo Special Seam Karo-III is most important from quality point of view. Barakar Formation: It occupies a major part of the area. It is represented by medium to coarse grained sandstone, grey shales and thick coal seams (Karo-V– X). The coal seam however is highly interbaded.

	Parameters	Details															
		Igneous intrusion – Igneous activity has been recorded in the western and southern part of the block. The intrusives are represented mainly by dolerite dykes and mica-lamprophyre. In boreholes EBC-11 & 21 the seam Karo-III has been completely burnt due to igneous intrusion. A steeply dipping dolerite dyke has been exposed in a ravine east of Tisri nala near borehole EBC-11. The dolerite dyke has been encountered in EBC-11 from a depth of 7.50m to 53.80m.															
2.2.2	Geology: The Selected Dhorī Geological Block covering an area of 3.00 Sq km (approx.) is bounded by Latitude 23^o 45' and 23^o 48' N and longitude 86^o 02' and 86^o 03' E. It is located in the eastern most part of the East Bokaro Coalfield and lies in the Bokaro districts of Jharkhand. Geological Report on exploration carried out in Selected Dhorī Block, East Bokaro Coalfield. District-Giridih, Bihar, May 1977, CCL, Ranchi. 2.2.2.1 Exploration Status In total 18 boreholes have been drilled in different phases from 1975 to 1978. Total meterage of 2059.20 m by various agencies. The borehole density of the Geological Block is as follows: <table><tr><th>Block</th><th>Area (sq km)</th><th>No of Boreholes</th><th>Meterage Drilled</th></tr><tr><td rowspan="2">Selected Dhorī</td><td>3.0</td><td>CCL (CDD I-10)</td><td>Sept.1975-May 1976</td></tr><tr><td></td><td>GSI (EBC-7,8,9,11, 17,21,24,30)</td><td>1967-78</td></tr><tr><td>Overall</td><td>3.00</td><td>18</td><td>2059.20</td></tr></table> Additionally, 8 boreholes have been drilled recently by CCL to ascertain the data in-sufficiency mostly in the south-western part. However, the quality estimation has not been done in these boreholes. The borehole data within the selected Dhorī geological block for seam-III is very low. Hence, the alignment of fault may change during mining. 2.2.2.2 Deposit Structure The strike of the beds in general is East - West with a southerly dip varying from 7^o to 12^o. A number of faults have been encountered within the Geological Block. The blocks within the projected area with their location, extent and amount of throw are enumerated in the table below:		Block	Area (sq km)	No of Boreholes	Meterage Drilled	Selected Dhorī	3.0	CCL (CDD I-10)	Sept.1975-May 1976		GSI (EBC-7,8,9,11, 17,21,24,30)	1967-78	Overall	3.00	18	2059.20
Block	Area (sq km)	No of Boreholes	Meterage Drilled														
Selected Dhorī	3.0	CCL (CDD I-10)	Sept.1975-May 1976														
		GSI (EBC-7,8,9,11, 17,21,24,30)	1967-78														
Overall	3.00	18	2059.20														

	Parameters		Details		
	Fault No	Location & Extent of Fault	Trend of Fault	Amount & Direction of Throw	Evidence of Fault
	F1	Central part of the block merges with F1 of Tisri and abuts with FS7.	E-W	20m Northerly	Based on displacement of outcrop of seams.
	F2	Southern part of the block near borehole CDD4.	NE-SW	10m, Northerly	Seam III omitted and parting between Seam V & II reduced considerably.
	F3	Southern part of the block	ENE-WSW	10m, Northerly	Lower part of Karo group of seams omitted upto 10m.
	F4	Southern part of the block near EBC-21	NE-SW	10m, North Westerly	Displacement of outcrop of Karo group of seams.
	F6	Southern part of the block near CDD-10	ENE-WSW	10m Northerly	Omission of Karo group of seams upto 10m.
	F7	Northern part of the block near MBT-3	E-W	35m, Northerly	Based on stratum contour
	F8	Northern part of the block near EBC-30	WNW-ESE	25m, Southerly	Based on stratum contour
	F9	North-western part of the block	NE-SW	50m, North Westerly	Based on stratum contour

2.2.2.3 Sequence of Coal Seams and Parting

The details of sequence of coal seam and parting is given below:

Seam	BH Intersection	Thickness Range (m)		
		Av.	Minimum	Maximum
Comb. Karo Gr. of seams Karo VI to X	12	60.00	57.33	69.28
Parting		25.00	24.50	27.10
Karo V	11	3.00	2.92	4.93
Parting		10.00	5.34	14.15
Karo IV	10	<1.00	0.18	1.15
Parting		4.50	4.40	5.10
Karo III	10	5.50	3.25	7.66
Parting		6.00	4.40	8.60
Karo II	4	<1.00	0.17	1.25
Parting		4.00	4.00	5.00
Karo I	2		0.30	0.40

	<i>Parameters</i>	<i>Details</i>
	2.2.2.4 Description of Coal Seams: 2.2.2.4.1 Seam Karo –VI to X All the Karo groups of seams occur in the block and are designated as Seam Karo-I to X in ascending order. Karo VI to X groups occurring in the Barakar Formation is combined and thick and under active exploitation in the block through opencast. 2.2.2.4.2 Seam Karo –V Seam Karo-V is the bottom most Barakar Formation. Seam Karo- V, though having workable thickness has deteriorated in quality as major part of the seam is composed of carbonaceous shale and shaly coal. The borehole intersection of seam Karo-V in boreholes MBD-5,6,7,14,15,16,17,18,20,24 & 25 and EBC-6, & 10 and CMESD-4,7,20,22 falling in sector-II of Tisri Block shows that the seam is converted into carbonaceous shale. Thickness Thickness of Karo Seam-V varies from 0.15m to 5.04m in Tarmi side and 0.44m to 4.90m in Tisri side. It has about 3.0 to 4.0m of thickness over major part of the area. There is no information of Seam-V in Selected Dhori as most of the part has been converted to carb shale in this region. However, quality has been derived based on GR of Tarmi and Tisri. Detailed analysis of Seam-V will be required in this zone before start of mining activity. Roof and Floor The immediate roof of the seam is generally medium to medium grained sandstone which gradually changes to grey shale which ultimately to carbonaceous shell. The floor is mostly shale and carbonaceous Shale. Dirt Bands Number of dirt bands varies from 1 to 12 with a cumulative thickness varying from 0.15m to 4.85m. The seam is highly inter-banded in nature and there is wide variation in the percentage of dirt bands ranging from 45% to 98% of seam thickness. The bands are mainly represented by carbonaceous shell and shaly coal. Quality The grade of seam Karo-V in sector V of Tarmi part is G to Ungraded, whereas in Sector-II of Tisri part it is Ungraded. In Selected Dhori part the seam has mostly been converted to carbonaceous shale. Seam structure available for boreholes CDD-1, 2, 3, 4 and 9 only. In all boreholes except CCD-2 the seam is converted to carbonaceous Shale. 2.2.2.4.3 Seam Karo-IV Detail with regard to seam thickness, quality and assessment of reserve of this seam is not available in the GR for Selected Dhori part. In Tarmi block though its thickness varies from 0.10 to 1.30m, it is unworkable throughout the block excepting around bore holes EBC-7 & 22 (located wide apart) where its thickness is more than 1.0m. Quality characteristic for this seam is not available for Tarmi block. Though this seam has been established to be	

	Parameters	Details
	workable in a few bore holes but as such no workable patch could be delineated, hence its reserve has not been assessed. In Tisri the thickness of the seam is usually around 0.90m. The grade in Sector-II varies from Steel Grade-II to W-II. 2.2.2.4.4 Seam Karo-III It is the Bottom-most workable seam among all the coal seams of the Karharbari Formation in the block. It has been encountered in 10 BHs drilled by GSI and CCL. It is completely burnt in boreholes EBC-11 & 21. It incrops in the northern part of the block and has roughly east-west strike. Thickness Thickness of Seam Karo -III varies from 3.25m to 7.66m. It has about 5.0m of thickness over major part of the area. Roof and Floor The immediate roof of the seam is generally medium to coarse grained sandstone with intermittent thin sandy shale bands. The floor is mostly coarse to gritty sandstone in nature. Dirt Bands The seam is almost free from dirt band. However, very thin band of carbonaceous shale has been observed in CDD-9 drilled by CCL. Quality In-band ash is available only in three boreholes CDD-1, 2 & 9 drilled by CCL. Accordingly, the ash varies from 23.8% to 28.0 %. In other boreholes drilled by GSI, EBC-7, 8, 9, 17 & 30; analysis shows ash percentage from 15.1 to 22.5 %. In major part of the area the grade of the coal is Steel-II to W-II. However, the grade becomes W-IV near CDD-1.	
2.2.3	Geological Block Area “Ha”	300
2.2.4	Status of Exploration of the block	Explored
2.2.5	Area covered by ‘detailed’ exploration within the block (sq. km)	-
2.2.6	Whether entire lease area has been covered by ‘detailed’ exploration.	Yes
2.2.7	No. of boreholes drilled within the block	Total (18+8) boreholes
2.2.8	Whether any further exploration/study is required or suggested and time frame in which it is to be completed	A provision of 4-5 boreholes should be kept for drilling of about 500m to meet the emergent requirement of additional information at the time of mining coal from the property in the incrop zone.
2.2.10	Overall borehole density within the block (no./ sq. km) approx	9
2.2.11	No of Seams available as per GR (Geological Report)	Top to bottom 1. Karo VI to X combined 2. Karo V 3. Karo IV 4. Karo III 5. Karo II

	Parameters	Details																																																
		6. Karo I																																																
2.2.12	Seams not considered for Mining with Reasons	Seam IV, Seam II and Seam I. These seams are not mineable due to very low thickness. Karo VI to X combined has been considered for mining. This seam forms the topmost seam in the proposed mining area. The seam has been mined extensively with an occurrence of fire in the area. Presence of this seam is possible in patches in the proposed mining area. Since its extent and quantity could not be ascertained due to past mining, its reserve has not been assessed. However, the same needs to mined out along with the underlying seams.																																																
2.2.13	Dip of the Seam	The dip of ranges from 7-12°																																																
2.2.14	Seam wise Details of Reserves Seam wise details of Geological Vis-à-vis Mineable Reserves <table><tr><th>S N</th><th>Seam Name</th><th>Avg Thickness considered (m)</th><th>Thickness range (m)</th><th>Geological Reserve (MT)</th><th>Mineable Reserve (MT)</th></tr><tr><td>1</td><td>Karo VI to X</td><td>-</td><td>57.33-69.28</td><td>-</td><td>-</td></tr><tr><td>2</td><td>Karo V</td><td>2.00</td><td>2.92-4.93</td><td>7.01</td><td>4.51</td></tr><tr><td>3</td><td>Karo IV</td><td>-</td><td>0.18-1.15</td><td>-</td><td>-</td></tr><tr><td>4</td><td>Karo III</td><td>4.00</td><td>3.25-7.66</td><td>12.75</td><td>6.21</td></tr><tr><td>5</td><td>Karo II</td><td>-</td><td>0.17-1.25</td><td>-</td><td></td></tr><tr><td>6</td><td>Karo I</td><td>-</td><td>0.30-0.40</td><td>-</td><td></td></tr><tr><td></td><td>TOTAL</td><td></td><td></td><td>19.76</td><td>10.72</td></tr></table>		S N	Seam Name	Avg Thickness considered (m)	Thickness range (m)	Geological Reserve (MT)	Mineable Reserve (MT)	1	Karo VI to X	-	57.33-69.28	-	-	2	Karo V	2.00	2.92-4.93	7.01	4.51	3	Karo IV	-	0.18-1.15	-	-	4	Karo III	4.00	3.25-7.66	12.75	6.21	5	Karo II	-	0.17-1.25	-		6	Karo I	-	0.30-0.40	-			TOTAL			19.76	10.72
S N	Seam Name	Avg Thickness considered (m)	Thickness range (m)	Geological Reserve (MT)	Mineable Reserve (MT)																																													
1	Karo VI to X	-	57.33-69.28	-	-																																													
2	Karo V	2.00	2.92-4.93	7.01	4.51																																													
3	Karo IV	-	0.18-1.15	-	-																																													
4	Karo III	4.00	3.25-7.66	12.75	6.21																																													
5	Karo II	-	0.17-1.25	-																																														
6	Karo I	-	0.30-0.40	-																																														
	TOTAL			19.76	10.72																																													
2.2.15	Methodology of reserves estimation (also mention if any software package has been used).	MINEX software has been used for reserve estimation.																																																
2.2.16	Average Grade	W III and G 9																																																
2.2.17	Gross Geological Reserve of the block “Mte”	21.96																																																
2.2.18	Net Geological Reserve of the block “Mte”	19.76																																																
2.2.19	Minable Reserve of the block “Mte”	10.72																																																
2.2.20	Blocked Reserve “Mte	-																																																
2.2.21	Corresponding extractable reserve of the block “Mte”	-																																																

	<i>Parameters</i>	<i>Details</i>
2.2.22	Percentage of Extraction	100%
2.2.23	Reserve already depleted (Base date of Mining Plan)	-
2.2.24	Balance Reserve (as on Base Date)	10.72 Mte

CHAPTER 3: MINING

	Parameters	Details														
3.1	MINING METHOD															
3.1.1	Existing method of mining if the mine is under operation	Opencast Mining with shovel-dumper combination														
3.1.2	Proposed method of mining with justification on suitability of method of mining	Seams to be worked: Karo VI to X combined, Karo V and Karo III. Choice of mining method: Considering the geo-mining conditions of the Selected Dhori OCP (for extraction of lower seams) viz. ➤ Gradient of seam floor, viz., 7° - 12° ➤ Multiple seams with variable thickness and ➤ Smooth, flexible and easy operation The method of mining proposed to be adopted to extract coal and OB in Selected Dhori OCM will be open cast mining with shovel-dumper combination of mining systems. Life of mine: The mine life for nominal production is 8 years. The break-up of life of mine are as under: <table><tr><th>Particulars</th><th>Years</th></tr><tr><td>Mine Life</td><td>8</td></tr><tr><td>Construction period</td><td>-</td></tr><tr><td>Production build-up period</td><td>3</td></tr><tr><td>Production period</td><td>3</td></tr><tr><td>Tapering period</td><td>2</td></tr><tr><td>Total period</td><td>8</td></tr></table> Mine Boundaries: The mine boundary of the OCP has been fixed as follows: East: A barrier of 30m has been kept between western limit of Tarmi OCP and eastern limit of proposed quarry. West: The quarry surface of the western boundary has been fixed along the eastern bank of Tisri nala keeping a safe distance of 60m.	Particulars	Years	Mine Life	8	Construction period	-	Production build-up period	3	Production period	3	Tapering period	2	Total period	8
Particulars	Years															
Mine Life	8															
Construction period	-															
Production build-up period	3															
Production period	3															
Tapering period	2															
Total period	8															

	Parameters	Details																																																												
		North: The northern floor boundary has been fixed along the fault F7. South: A 45 m barrier between Gomoh – Barkakana loop line and surface edge of the proposed quarry has been kept. Final Stage Mine Parameters: <table><tr><th>Parameters</th><th>Unit</th><th>Minimum</th><th>Maximum</th></tr><tr><td>Dimensions of the quarry along strike (on floor)</td><td>m</td><td>600</td><td>1300</td></tr><tr><td>Depth of quarry</td><td>m</td><td>10</td><td>120</td></tr><tr><td>Dip rise length (on floor)</td><td>m</td><td>800</td><td>1450</td></tr><tr><td>Final Quarry Floor area</td><td>Sq.km</td><td colspan="2">1.09</td></tr><tr><td>Final Quarry Surface area</td><td>Sq.km</td><td colspan="2">1.79</td></tr><tr><td>Mineable reserves</td><td>(Mte)</td><td colspan="2">10.72</td></tr><tr><td>Total OB</td><td>(Mcum)</td><td colspan="2">66.00</td></tr><tr><td>Average Stripping Ratio</td><td>(cum/te)</td><td colspan="2">6.16</td></tr><tr><td>Mine Capacity (Maximum)</td><td>(MTY)</td><td colspan="2">2.0</td></tr></table> Choice of technology: Considering the geo-mining conditions viz. Gradient of seam floor, viz., 7° - 12°, multiple seams with variable thickness and smooth, flexible and easy operation Shovel-dumper combination has been proposed for mining the quarry. Mining System & System Parameters As the seams are dipping moderate to steep, the mine will follow horizontal slicing method. The mining system has been depicted in the cross section of the mine. The following mining parameters have been considered in the project. <table><tr><th>Sl. No.</th><th>Particular</th><th>Unit</th><th>Value</th></tr><tr><td>1</td><td>OB Bench Height for 10-12 cum shovels</td><td>m</td><td>12-15</td></tr><tr><td>2</td><td>OB Bench Height for 5.5-6.5 cum shovels</td><td>m</td><td>8-10</td></tr><tr><td>3</td><td>Coal Bench Height for 5.5-6.5 cum shovels</td><td>m</td><td>8-10</td></tr><tr><td>4</td><td>Working bench width</td><td>m</td><td>40</td></tr></table>	Parameters	Unit	Minimum	Maximum	Dimensions of the quarry along strike (on floor)	m	600	1300	Depth of quarry	m	10	120	Dip rise length (on floor)	m	800	1450	Final Quarry Floor area	Sq.km	1.09		Final Quarry Surface area	Sq.km	1.79		Mineable reserves	(Mte)	10.72		Total OB	(Mcum)	66.00		Average Stripping Ratio	(cum/te)	6.16		Mine Capacity (Maximum)	(MTY)	2.0		Sl. No.	Particular	Unit	Value	1	OB Bench Height for 10-12 cum shovels	m	12-15	2	OB Bench Height for 5.5-6.5 cum shovels	m	8-10	3	Coal Bench Height for 5.5-6.5 cum shovels	m	8-10	4	Working bench width	m	40
Parameters	Unit	Minimum	Maximum																																																											
Dimensions of the quarry along strike (on floor)	m	600	1300																																																											
Depth of quarry	m	10	120																																																											
Dip rise length (on floor)	m	800	1450																																																											
Final Quarry Floor area	Sq.km	1.09																																																												
Final Quarry Surface area	Sq.km	1.79																																																												
Mineable reserves	(Mte)	10.72																																																												
Total OB	(Mcum)	66.00																																																												
Average Stripping Ratio	(cum/te)	6.16																																																												
Mine Capacity (Maximum)	(MTY)	2.0																																																												
Sl. No.	Particular	Unit	Value																																																											
1	OB Bench Height for 10-12 cum shovels	m	12-15																																																											
2	OB Bench Height for 5.5-6.5 cum shovels	m	8-10																																																											
3	Coal Bench Height for 5.5-6.5 cum shovels	m	8-10																																																											
4	Working bench width	m	40																																																											

	Parameters	Details								
		5	Non - Working bench width	m	25					
		6	Bench Slope for OB and coal	Deg	70					
		7	Blast Hole dia for OB and coal	mm	250/160					
		8	Powder Factor in OB and coal	Kg/cum	0.3-0.4 & 0.2					
		Mine Scheduling and Calendar Programme of Excavation Mine operation in the quarry can start from 1st year in (as the required land is already in possession). Quarry will start from the northern side, south of fault F7 to touch seam-III floor at RL of 195m. Initially OB will be dumped in the dip side area. Working faces will advance towards south. As sufficient space is created, internal dump leaving a distance of 60-100m from the working faces will start from the de-coaled area north to south. The OB dumped in the dip side in the initial period will be rehandled and dumped inside the quarry. The haul road layout of the mine has been shown in the final stage plan prepared for the purpose. The width of the working and non-working benches has been kept at 40m and 25m throughout the life of the mine except first few years when the size of the equipment permits for smaller working and non-working bench width. Transporting of coal from the bench to the pit head coal dump will be carried out by hauling dumpers. The quarry will produce two distinct quality of coal throughout its life. Based on the normative annual capacity of the mine as 2.0 MT, the proposed mining schedule is generated for 8 years of mine life. The targeted coal production from the mine is envisaged in 4th year. The average stripping ratio is 6.16 cum/te. The summarized mining schedule for coal extraction and corresponding overburden load for the project, annual coal & OB production schedule has been provided in the tables below: Summarized Mining Schedule <table><tr><th>Period</th><th>Year</th><th>Coal Production (Mt)</th><th>OB Removal (Mcum)</th><th>Stripping Ratio (cum/te)</th></tr></table>				Period	Year	Coal Production (Mt)	OB Removal (Mcum)	Stripping Ratio (cum/te)
Period	Year	Coal Production (Mt)	OB Removal (Mcum)	Stripping Ratio (cum/te)						

	Parameters	Details					
		Capacity built-up	1	0.50	3.70	7.41	
			2	1.00	7.41	7.41	
			3	1.50	10.18	6.79	
		Production	4	2.00	12.36	6.18	
			5	2.00	11.40	5.70	
			6	2.00	11.43	5.72	
		Tapering	7	1.20	6.66	5.55	
			8	0.52	2.85	5.49	
		TOTAL			10.72	66.00	6.16
		The envisaged requirements of HEMM are given below:					
Equipment Schedule							
HEMM		Capacity	Capacity build-up				Max
			1	2	3	4	
OB							
Diesel Hyd Shovel		10-12 Cum	1	1	2	2	2
Diesel Hyd Shovel		5.5-6.5 Cum	1	2	2	2	2
Rear Dumper		100 T	6	8	10	12	12
Rear Dumper		60 T	6	8	9	10	10
Diesel RBH Drill		250 mm	0	1	1	1	1
Diesel RBH Drill		160 mm	1	2	2	2	2
Dozer		410 HP	2	3	3	3	3
Coal							
Diesel Hyd Backhoe		4.3-5.0 Cum	1	1	1	1	1
Rear Dumper		60 T	2	2	4	4	4
Diesel RBH Drill		160 mm	1	1	4	4	4
Dozer with Ripper Attachment		410 HP	1	4	4	4	4
Common							
Diesel Hyd Backhoe		2-3 Cum	1	1	1	1	1
FE Loader		5-6 Cum	1	1	1	1	1
Dump Truck		20 T	2	3	4	4	4
Grader		250-280 HP	1	1	2	2	2
Wheel Dozer		460 HP	1	1	2	2	2
R T Crane		40T	1	1	1	1	1
R T Crane		20T	1	1	1	1	1
Mobile Crane		8-14T	1	1	1	1	1
Dozer with Ripper Attachment		850 HP	1	1	1	1	1
Tyre Handler		35 kN	1	1	1	1	1

	Parameters	Details						
		Vibratory Compactor		1	1	1	1	
		Water Sprinkler	28KL	1	2	2	3	3
		Reclamation						
		Water Sprinkler	28 kL		1	1	2	2
		Dozer	410 HP		1	1	2	2
		Mining Method for Overburden Removal						
		The OB benches along with major parting are proposed to be taken using two different shovel dumper configurations. The top OB and thick partings are proposed to be excavated by 10-12 cum diesel hydraulic shovel with 100T RD. Thinner partings are proposed to be excavated by 5.5-6.5cum diesel hydraulic shovels with 60T RD. For the estimation of the dumper population, the lead for OB transportation has been considered for each year and for each bench.						
		Mining Method for Coal Winning						
		For coal production, 4.3-5.0 cum diesel hydraulic backhoe with 60T RD have been proposed.						
		Drilling & Blasting						
		The drilling and blasting operations for loosening of coal and OB are necessary before excavation by shovels. The sufficient number of dozers provided in the project will carry out the site preparation. The blasthole drilling will be done in patterns decided in advance depending on the strata hardness and as per the conditions laid down by DGMS.						
		Blasthole drills of 250/160 mm diameter will be used for drilling in OB/ partings and coal benches.						
		The standard practice involving the electric detonators for the initiation of detonating cord, detonating relays to achieve hole-to-hole delays, use of Heavy ANFO, slurry or emulsion explosives as the column charge will be used for blasting.						
		Seam Wise Extractable Reserves (in MT)						
		Name of Seam		Extractable Reserve (MT)				
VI to X Combined		-						
V		4.51						
III		6.21						
Total		10.72						

	Parameters	Details												
		Dumping Strategy Total overburden quantities estimated for Selected Dhori OCM is 66.00 Mcum of OB. Out of which about 9.72 Mcum of OB has been proposed to be rehandled from 4th year onwards. All the OB removed will be backfilled within the quarry itself. The proposed dump height is maximum 60m from immediate surface level. Total two decks of height 30m each leaving 30m wide berms on each deck have been proposed and the final stage dump will attain a maximum RL of 270m. The internal dumping will be carried out from the benches in the batter. Dumpers movement will be so planned as to avoid the unnecessary movement of dumpers in different horizons. To maintain the stability of the internal OB dump, the precautions laid down in Chapter 4 should be strictly adhered. Regular monitoring of bench, quarry high walls and spoil dumps stability should be done using Slope Stability Radar or similar instrument. The Tentative details of internal and external dumps OB quantity is given below: <table><tr><th>Dump</th><th>Volume (Mcum)</th><th>Top RL (m)</th></tr><tr><td>External</td><td>-</td><td>-</td></tr><tr><td>Internal</td><td>66.00</td><td>+270</td></tr><tr><td>Total</td><td>66.00</td><td>+270</td></tr></table>	Dump	Volume (Mcum)	Top RL (m)	External	-	-	Internal	66.00	+270	Total	66.00	+270
Dump	Volume (Mcum)	Top RL (m)												
External	-	-												
Internal	66.00	+270												
Total	66.00	+270												
3.1.3	Coal production capacity proposed “Mtpa”	2.0 Mtpa												
3.1.4	Justification for optimization Coal production capacity	Coal production capacity has been fixed based on coal thickness and normative annual advance.												
3.1.5	Calendar year from which the production will start	1 st Year												
3.1.6	Year of Achieving rated production	4 th Year												
3.1.7	Tentative Coal Production Plan “Mte” <table><tr><th>Period</th><th>Year</th><th>Coal Production (Mt)</th><th>OB Removal (Mcum)</th><th>Stripping Ratio (cum/te)</th></tr><tr><td>Capacity built-up</td><td>1</td><td>0.50</td><td>3.70</td><td>7.41</td></tr></table>		Period	Year	Coal Production (Mt)	OB Removal (Mcum)	Stripping Ratio (cum/te)	Capacity built-up	1	0.50	3.70	7.41		
Period	Year	Coal Production (Mt)	OB Removal (Mcum)	Stripping Ratio (cum/te)										
Capacity built-up	1	0.50	3.70	7.41										

	Parameters		Details				
			2	1.00	7.41	7.41	
			3	1.50	10.18	6.79	
		Production	4	2.00	12.36	6.18	
			5	2.00	11.40	5.70	
			6	2.00	11.43	5.72	
		Tapering	7	1.20	6.66	5.55	
			8	0.52	2.85	5.49	
		TOTAL		10.72	66.00	6.16	
3.1.8	Rated Capacity "Mtpa"						
	-	By OC	2 Mtpa				
	-	By UG	-				
	-	Overall	2 Mtpa				
3.1.9	Life of the mine: "Years"						
	-	By OC	8 Years				
	-	By UG	-				
	-	Overall	8 Years				
3.1.10	Whether the proposed external OB dump site is coal/ lignite bearing: If so, whether coal/lignite below waste disposal area is extractable.		Not applicable				
3.1.11	Whether negative proving for coal / lignite in the proposed site for OB dump/ infrastructure has been done.		Not Required				
3.1.12	Results of any investigation carried out for scientific mining, conservation of minerals and protection of environment; future proposals.		Slope stability study for pit and dump slopes, hydro-geology study and washability study proposed				

CHAPTER 4: SAFETY MANAGEMENT

	<i>Parameters</i>	<i>Details</i>
4.1	Safety Management	
4.1.1	Important safety aspects: Major Risks and uncertainties to the project viz. Proximity to river, adjacent working, geo-mining disturbances, slope stability and remedial measures suggested. It should also include proposed overall slope of the quarry and OB dump, dump height, strata control, fire and spontaneous heating, gas monitoring, disaster management, danger from inrush of water etc.	Safety of men and machine deployed in the mining area should be properly taken care of irrespective of whether the mining activities are performed by departmental or by outsourcing means. All the the statutory provisions laid down in The Mines Act 1952, Coal Mine Regulation 2017 and specific permission from DGMS relating to mining in general and opencast mining in particular have to be adhered to and implemented in order to maintain day to day safety. 1. Safety aspects for of HEMM / equipment Special precaution should be taken while deploying workers in the mine. Before employing any person to the mine proper vocation training should be imparted and recommendations of various Safety Conferences should be strictly followed. Some of the major aspects are as follows: - A) For persons: i) No persons shall be deployed unless he is trained at VTC and holds VTC Certificates. A record of the same shall be maintained. ii) Records in Form-B and Form-D shall be maintained. iii) Records of driving license of operators shall be kept by competent authority and shall be made readily available for inspection by management. iv) Adequate supervision shall be maintained by competent persons, including officials and technicians. B) For Machineries: Provisions of Regulation 109, 110, 216 & 217 of CMR 2017 and DGMS Cir. (Tech.) 1 of 1999 should be strictly adhered to along with the following: i) All machinery and plant used in connection with working of a mine shall be of good design, sound construction, and suitable material, adequate strength, free from patent defect and properly maintained. ii) The owner, agent and manager shall provide adequate training facilities and ensure proper training of persons employed for operation and maintenance of machinery and plant. iii) No person except an engineer or other competent person under his supervision shall undertake any work on machinery and plant in which technical knowledge or experience is required.

	Parameters	Details
		iv) All the machineries to be deployed in mines shall be so designed as to afford the operator clear and uninterrupted vision all around. v) Every heavy earth moving machineries, including trucks and tippers, used in mine shall be fitted with adequate safety features or devices as specified by DGMS. All equipment shall be provided with audio-visual alarms, proper light for use at night and fitted with suitable type of the fire extinguishers. vi) Truck mounted drill machines designed for tube well drilling for sources of water shall not be used and only proper type of blast hole drill machine, especially designed for mining purpose, shall be used in the mine. vii) Every heavy earth moving machinery shall be under the charge of a competent person (Operator or Driver), authorized in writing by the Manager. viii) All persons employed or to be employed to operate heavy earth moving machinery shall be trained and their competency shall be evaluated by a Board constituted by the management, who shall be persons who are not connected with imparting of training. ix) A proper record of repair and maintenance along with inspection done by competent authority and defect pointed out shall be maintained and signed by authorized person. x) Only such fitters or mechanics possessing driver's or operator's license, shall be allowed to carry out test-run of heavy earth moving machineries. xi) No person other than the operator or the driver or any person so authorised in writing by the manager shall be allowed to ride on a heavy earth moving machinery C) General: i) Every person shall strictly adhere to the provisions of the Act and of the rules and regulations and to any order or direction issued by the manager or an official with a view to the safety or convenience of persons not being inconsistent with the Act, rules and these regulations; nor shall he neglect or refuse to obey such orders or directions. ii) Every person shall, immediately before proceeding to work and immediately after terminating work at the end of his shift have his name recorded in the appropriate register. iii) Risk Management Plan of tipper/pay loader shall be made and implemented.

	Parameters	Details
		iv) All operators/drivers so authorised by the Manager shall observe the Regulation 62 and 63 of CMR 2017 and obey the systematic traffics rules prepared by management v) 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 a accordance of (Reg. 8 of CMR 2017) and Section 23 of The Mines Act 1952 may be given and other necessary steps may be taken in accordance with the Mines Act 1952. vi) Mine authority shall operate transport system in such a way so as to minimize pollution in the mine. 2 Stability of Benches, Quarry Highwalls and Spoil Dumps During quarry operations, it is necessary to adopt required mining parameters for the stability of benches, highwalls and spoil dumps. It is also mandatory to examine systematically the fencing of mine workings, landslides and cracks between benches. It is required to maintain well-graded and wide roads on benches keeping the width of working areas sufficient for spreading of blasted rock and movement of the mining and transport equipment. During actual mining operation, systematic observations of the condition of benches, high wall slopes and spoil dumps should be carried out and the dimensions be modified if necessary to suit the local conditions. To ascertain the optimum slope angles for stability of quarry benches, highwalls and spoil dumps, scientific study of slope stability along with hydro-geological study of the area needs to under taken. During actual mining operation, systematic observations of the condition of benches, high wall slopes and spoil dumps should be carried out and the dimensions be modified if necessary to suit the local conditions. Provisions laid down in Reg. 106 and 108 of the Coal Mines regulation 2017 shall be strictly adhered to for the safety of quarry and OB/ spoil dumps. In addition to this, the following precaution should be considered: i) The spoil dump height should not exceed 90m from immediate surface level with an overall slope of 28° or less. In the event of encountering steep floor gradient, floor blasting should be done and the area properly levelled by dozer before spoil dumping.

	Parameters	Details
		ii) No working or construction should be allowed within the 60m toe of the OB dump. iii) Before dumping the OB on the floor of seam, at least 10m length all along the strike length should be made horizontal at every 50 meter by floor dinting/blasting. iv) Dump should be created in such a way that there is no chance of accumulation of water in and around the base of dump as it will adversely affect the shear strength of the base material of dump. It must be ensured that there is no stagnant water at the toe of dump and the top of the dump. v) The toe and face of the dump should not be eroded or cut at any point of time to avoid slope failure. A suitable toe wall should be created along the dump periphery. vi) Formation of dumping should be done in square or circular or any regular shape as far as possible. vii) Proper drainage system should be provided to bring down rain water by construction of inclined drain on dump face and catch drain on all benches. viii) During active period of dump, all rain water should be diverted away from mining site as far as possible. ix) Sump and pumping capacity should be sufficient to accommodate peak surface run-off and seepage of water. x) Gabion wall and garland drain should be constructed and maintained to trap the surface run-off and sludge coming from dump. xi) Plantation and grassing should be done on top and slope of the dump respectively. xii) Regular monitoring is required for development of tension crack, gullies, movement of soil mass, stagnation of water and any other unusual occurrence. In case of dump movement, rate of movement of dump should be monitored. Special attention should be given at curve area/turning area of the dump. 3 Precautions Against Danger of Inundation from Surface Water i) Adequate protection against any danger of inrush of surface water into the mine or part shall be provided and maintained to the satisfaction of DGMS, whose decision shall be final. ii) The entrance into the mine shall be so designed, constructed and maintained that its lowest point (which means the point at which a body

	Parameters	Details
		of rising water on surface can enter the mine) shall be not less than 3.0 meters above the highest flood level at that point. iii) Every year, during the rains constant watch shall be kept on the flood levels on the surface of the mine and if at any time the levels cross the highest levels earlier recorded, such levels shall be marked by permanent posts along the edges of water and the new highest levels thus observed shall be recorded with the date as the highest flood level on the plans by an actual survey. iv) If water dams or reservoirs are built across rivers and water courses on the upstream side of the mine, arrangements shall be made for communication between appropriate authorities for the purpose of ascertaining the quantity and timing of water released from the dams which is likely to endanger safety of the mine and arrangement for similar communication shall be made when water level rises on the upstream side which is likely to endanger the mine. v) The highest flood levels and danger levels at least 1.2 meters below the highest flood level, shall be permanently marked at appropriate places on the surface and whenever water rises towards the danger level at any place, all persons shall be withdrawn from the mine sufficiently in advance and for this purpose adequate arrangements of quick communication to all parts of the mine by effective systems shall be provided and maintained. vi) No working shall be made in the mine at any spot lying within a horizontal distance of 15 meters from either bank of a river or nala. vii) A competent person shall, once at least in every fourteen days during the rainy season and once at least in every thirty days during other periods of the year, examine every protective measure provided under regulations 149, whether in use or not, for their stability, and a report of every such examination shall be recorded. The protective measures and workings shall also be inspected, once at least in every quarter by the Manager personally. viii) A careful assessment is to be made against the danger from surface water before the onset of rainy season. The necessary precautions should be clearly laid down and implemented. A garland drain needs to be provided to drain away the surface rainwater from coming into the mine. ix) An embankment, 3.0m above the HFL, along the Bokaro River and Nakti nala should be made. Inspections for any accumulation of rainwater, obstruction in normal drainage and weakening in the embankment should be made.

	Parameters	Details
		x) Standing order for withdrawal of working persons in case of apprehended danger. During heavy rain inspection of vulnerable points is essential. In case of any danger persons are to be withdrawn to safer places for Protection of Equipment Deployed at bottom horizons from flooding. During the heavy monsoon period, the mining operation in the lower-most bench may have to be stopped. Therefore, it is proposed to drown the lower-most bench, which would work as a sump. The water will be pumped out and discharged into the nearby nala/ river after proper sedimentation. For ensuring safety of the equipment while working out bottom horizons with no access to surface profile, the following measures should be taken: i) Drivage of initial trenches if any and coal cutting on bottom benches should be done during the dry period of the year. ii) Ramps should be made for quick shifting of equipment from bottom horizons, liable to be flooded during monsoon period, to the top horizons. 5 Prevention of Electric Shocks: During mining operations, all the statutory provisions of the Indian Electricity Rules 1956, and Indian Standards for installation and maintenance of electrical equipment etc. should be observed. i) For protection from electric shocks to persons, all electrical equipment with voltage up to 1000V should be provided with Earth Leakage Relay, which will automatically disconnect electrical circuits. ii) Closed mobile substations and switchgears should be mechanically interlocked which exclude the possibility of opening the door when oil switch and air circuit breakers are in operation. iii) All metal parts of electrical equipment should be properly earthed to avoid failure of insulation. iv) All H.T lines and cables located within the blasting zones should be disconnected during charging & blasting operations. 6 Dust Suppression & Dilution of Exhaust Fumes: For precaution against dust, Regulation 143, 144 and 145 of CMR 2017 should be observed. Beside this the following measures should be adopted for dust suppression at all quarry working places, dumps, haul roads, CHP and near other auxiliary mining operations.

	Parameters	Details
		i) Spraying with water on all working faces & haul roads, by special spraying machines or water-sprinkler. ii) While drilling holes, it is necessary to use dust extraction devices. iii) Installation of local dust suppression and air conditioning devices in cabins of excavators and drilling rigs may be considered. iv) Leveling of spoil dump surface. v) Separate dust suppression arrangement should be provided for CHP. To prevent collection of harmful mixtures in the atmosphere, from the different sections of quarry workings, it is recommended: - To spread out the sources of dust formation and omission of harmful gases throughout the working area of the quarry, the following precautions should be taken: i) Drilling & blasting operations should be timed for periods of maximum wind activity during the day. ii) Dumpers may be provided with purifiers for exhaust gases. 7 Measures to Be Taken for Fire Fighting and Fire Prevention: In addition to statutory provisions as laid down in Reg 135, 139 and 140 of CMR 2017, the measures for firefighting and prevention of fires are as follows: i) Organisation of special cell for systematic observations to examine and prevent fire. ii) Removal of spillage of coal on benches and cleaning of coal horizons to prevent cases of coal heating. iii) Storage of lubricants and cotton waste in enclosed fireproof containers in working places. iv) Provision of fire extinguishers. 8 Measures to Be Taken While Working Above Underground Galleries: In addition to provisions laid down in DGMS Circulars (Tech. 2 & 3 of 1980, Tech. 11/1979), the additional measures for extracting pillars by opencast method are as follows: i) Quarry shall be worked by Heavy Earth Moving Machinery only. No manual operation in the quarry will be done.

	Parameters	Details
		ii) HEMMs, except drilling machines shall not be deployed on the bench where thickness of coal or overburden above the UG galleries, as proved by advance boreholes or other suitable methods, is less than 6m. iii) Exposed coal faces (including UG galleries shall be kept covered with fine grained incombustible OB material to prevent breathing of air and control fire to dip side working. This cover shall be removed only at the time of coal extraction. iv) Overburden containing carbonaceous material shall not be dumped within 30m of the exposed side of the coal benches. Hot overburden shall be quenched and cooled at dump sites. v) No person shall be allowed at any place in the opencast working where the thickness of overburden and/or coal over any gallery is less than 1.5m. vi) Except for the purpose of inspection and support work no person shall be allowed in the underground mine beneath and within 200m of the opencast excavation. The person visiting UG will take all safety precautions for safe working. vii) Blasting in fire area • No explosive other than slurry and emulsion explosive shall be used. • Blasting shall be done with detonating fuse down the hole. Fresh drill holes should be tightly plugged at the mouth. • Temperature inside the hole shall be measured by bi-metallic thermocouple heat sensor (before filling with water) and if the temperature exceeds 80°C in any hole, the hole will not be charged. • All blast holes shall be kept filled with water. When any hole is traversed by cracks or fissures the hole shall not be charged unless it is lined with an asbestos pipe and the hole filled with water. In addition, bentonite should be used for sealing any cracks at the bottom of the hole. • Detonating fuse shall not be laid on hot ground without taking suitable precautions. • Charging and firing of holes in any one round shall be expeditiously completed and in any case within 2 hours. • A parting of at least 2m between the bottom of a short hole and roof of underground gallery shall be left intact. • Effective muffling of hot shot holes with old wire rope screens shall be done for prevention of flying hot fragments.

	Parameters	Details
		• No blasting shall be done in crushed or broken ground. • No person shall be employed within 150m when blasting the heated material. • The spacing of hole in the coal/OB benches lying immediately above the galleries shall be so adjusted that the holes do not lie immediately above the galleries in order to ensure that blast holes do not directly fire into the underground working. • All holes in the coal/OB benches lying immediately above the galleries shall be charged with water impulses or with moist sand of at least 0.6m in length at the bottom of the hole. • No person including a shot firer shall take shelter within 100m of the quarry opening. Such shelter shall be of an approved design. 9 Measures to Be Taken While Drilling Blasting: Following measures should be taken during drilling and blasting operation in the quarry beside the statutory requirements: i) Drilling and Blasting in quarry should be done in accordance with the provisions of Mines Act, rules and regulations and based on the Standing Orders for the safe use of explosives. ii) Adequate safety measures have to be taken during blasting operation in the quarry so that men/machine are not affected. 10 Conservation Suitable measures should be taken to minimize coal loss during mining operations. Selective mining of in-seam dirt bands has been proposed. It is proposed not to dump any spoil material over coal bearing area, amenable for mining, at present or even at a future date. 11 Scientific Studies The slopes of the quarry and dumps have been proposed on the basis of experience in the adjoining areas. However, to ascertain optimum slope angles for stability of quarry batter and dumps a scientific study need be carried out. Similarly, hydro-geological study of the area is to under taken as none is available at present. Studies should also be carried out to ascertain the pattern of surface drainage, the manner of diversion of water courses to other water courses away from the mining area and the dimension of diversion dams, garland drains and other protective structures to be constructed.
4.1.2	A Commitment from the Company Board that entire mining operation will be carried out as per the	

	<i>Parameters</i>	<i>Details</i>
	Statutory provision given under Mines Act 1952, Coal Mine Regulation 2017 and & wherever specific permission will be required the company will approach the concerned authorities.	

CHAPTER 5: INFRASTRUCTURE FACILITIES

	Parameters	Details
5.1	Mine infrastructure required e.g. Equipment maintenance planning, Office buildings, Workshop.	The life of Selected Dhori OCM has been estimated as 8 years. For service and welfare buildings, temporary type of construction has been proposed. Provision for service buildings including PO office, pit office, magazine and other statutory buildings has already been proposed.
5.2	Power supply & illumination	It is envisaged that this project will receive power at 33 kV from Bokaro Thermal Power Station (BTPS) of DVC. For this, two nos. existing 33 kV overhead lines from BTPS to B&K Main-sub-station shall be extended up-to proposed quarry. A 33 kV energy meter shall be installed for recording its energy consumption. Approximate distance of the quarry from B&K Sub-station is approximately 5 km. Further, it is proposed to establish 1 no 2 X 5 MVA, 33/6.6 kV sub -station with provision for 2 nos. incoming 33 kV feeders and 12 nos. outgoing 6.6 kV feeders for supply of power to different power consuming equipment of the project. Haul Road Illumination For illumination of permanent haul roads, 250 W HPSV lamps and luminaires mounted on 11/13 m (approx.) high steel poles have been envisaged. Temporary haul roads shall be illuminated according to the position of working and available facility. Illumination of Quarry General Area/ Dump Area Illumination of quarry general area/dump area will be done with 400W HPSV lamp in flood light fixtures mounted on lighting towers. Sufficient no. of 25/10 kVA, 6.6 kV / 0.23 kV (L – L) transformers have been provided for illumination of quarry general area / dump area / haul road / face etc. Service Road Illumination 150 W HPSV lamps in street light luminaires are proposed for service road illumination in the project. The luminaires on steel tubular poles 11/13 m high is proposed for this purpose.
5.3	Drainage & Pumping:	During the rainy season, water will be allowed to accumulate in the sump on the floor of lower most seam of the quarry. Sumps are provided for the dewatering pumps which will transfer in-pit water for controlled discharge off the site. The planning of dewatering the mine shall be done in such a way that the working faces and haul roads in the quarry shall remain dry as far as possible. The layout of the quarry provides suitable gradient along the quarry floors and the benches to facilitate self-drainage of water to the sump at the lowest level of the quarry. Water accumulated in the mine sump will be pumped out to the surface.

	Pumping Capacity Pump Selection	Probable water accumulation on the day of maximum rainfall taking 10% for seepage and underground precipitation = 144082 Cum. Pumping capacity/hr = 1201 Cum/hr (333 lps) Main Pumps- Two no of 120 lps x 180 m head pumps have been provided for the mine. Low Head Pumps Besides the above main pumps one no of 75 lps x 80 m head pumps have also been provided to dewater the quarry during mining operation. Face Pumps and Slurry Pumps Two no of Face Pumps of 15 lps. x 60 m head and one no of Slurry Pump of 22 lps x 45 m head have been provided to pump out the water & slurry respectively accumulated near the working faces of the quarry. Diesel Pump One number of 75 lps x 180 m head diesel pump has been provided for emergency requirement.
5.4	Coal Handling Arrangement: Brief detail of the CHP/ Mode of Dispatch, Coal quality and Coal staking and handling arrangement	The total production of the mine has been the proposed as 2.0 MTY. The existing arrangement of coal handling will be utilised.

CHAPTER 6: LAND REQUIREMENT

	Parameters	Details									
6.1	LAND REQUIREMENT										
6.1.1	Total Land requirement for the mine in “Ha”	Break up of pre-mining land type (indicative) and source of data.									
		Type of Land								Area in Ha.	
		Tenancy								Nil	
		Govt Non-Forest									
		Forest								211.82	
Total								211.82			
Source-Plan supplied by Project.											
6.1.2	During mining Land use details (Area in Ha):										
	Type	Land use (Proposed)	Land Use (End of Life)	Land Use (Post Closure)							
				Agri cul tura l land	Plant ation	Water Body	Public/ Compa ny Use	Forest Land (Retur ned)	Undi st urbe d	Total	
	Excavation Area	179.44									
	Backfilled Area		151.51		151.51					151.51	
	Excavated Void		27.93			27.93				27.93	
	Without plantation										
	Top Soil Dump										
	External Dump										
	Safety Zone										
	Haul Road between quarries										
	Road diversion										
	Diversion/ below River/Nala/canal	1.48	1.48			1.48				1.48	
	Settling pond										
	Road & Infrastructure area	5.06	5.06				5.06			5.06	
	Rationalization area										
	Garland drains										
	Embankment	1.69	1.69		1.69					1.69	
Green Belt	24.15	24.15		24.15					24.15		

	Parameters		Details								
	Water Reservoir near pit										
	UG entry										
	Undisturbed/ Mining right for UG										
	Resettlement										
	Pit head power plant										
	Water harvesting										
	Agricultural land										
	Total	211.82	211.82		177.35	29.41	5.06				211.82
6.1.3	Surface features over the block area		North-south flowing Tisri Nala & Joria Nala discharging to West to east flowing Damodar River.								
6.1.4	No. of villages/Houses to be shifted		Nil								
6.1.5	Proposed Rehabilitation programme		No R&R involved in this Project								

CHAPTER 7: ENVIRONMENTAL MANAGEMENT

7.1	Commitment from the project proponent that the company will comply Environment and Forest Condition stipulated in the respective clearances	In order to carry out the proposed mining activity in an environmentally sustainable manner, suitable environmental protection measures shall be taken up at different stages of project operation and post closure In addition to this, few environmental protection measures have been suggested as a part of mine closure activities.
-----	---	--

CHAPTER 8: PROGRESSIVE & FINAL MINE CLOSURE PLAN

Sl. No	Land use During Mining		Post Mining Land Use Plan	
	Particulars	Area (Ha.)	Particulars	Area (Ha.)
1	Quarry	179.44	Internal dump reclaimed with Plantation	151.51
			void filled with water	27.93
2	Infrastructure (CHP, Colony, Road)	5.06	Infrastructure for Future Use	5.06
3	Green Belt/Safety Zone	24.15	Plantation on Green Belt/Safety Zone	24.15
4	Tisri Nala and Joria Nala	1.48	Tisri Nala and Joria Nala	1.48
5	Embankment against nala	1.69	Plantation on Embankment	1.69
Total Project Area		211.82	Total Project Area	211.82

Source: Plan supplied by the project.

Top Soil Management:

No top soil is available within the quarry due to rocky surface topography and decapping of top during operation of existing quarries.

8.10

Abandonment Cost and Financial Assurance

8.10.1

Abandonment Cost: Cost of Activities to be taken up for closure of the mine

S. No.	Activity	Weighted % of Mine Closure Cost	
		Progressive	Final
A	Dismantling of Structure	0	8.50
	Service building		
	Residential Building		
	Industrial Structure		
B	Safety & Security	6.50	3.20
	Random rubble masonry/concrete wall		
	Toe wall around dump/Gabbion wall		
	Barbed wire fencing		
	Fencing/boundary wall, fencing around water body		
	Garland drains		
C	OB Dump Reclamation		
C A	Technical Reclamation	60.50	60.50
	Re-handling of OB		
	Levelling by Dozer		

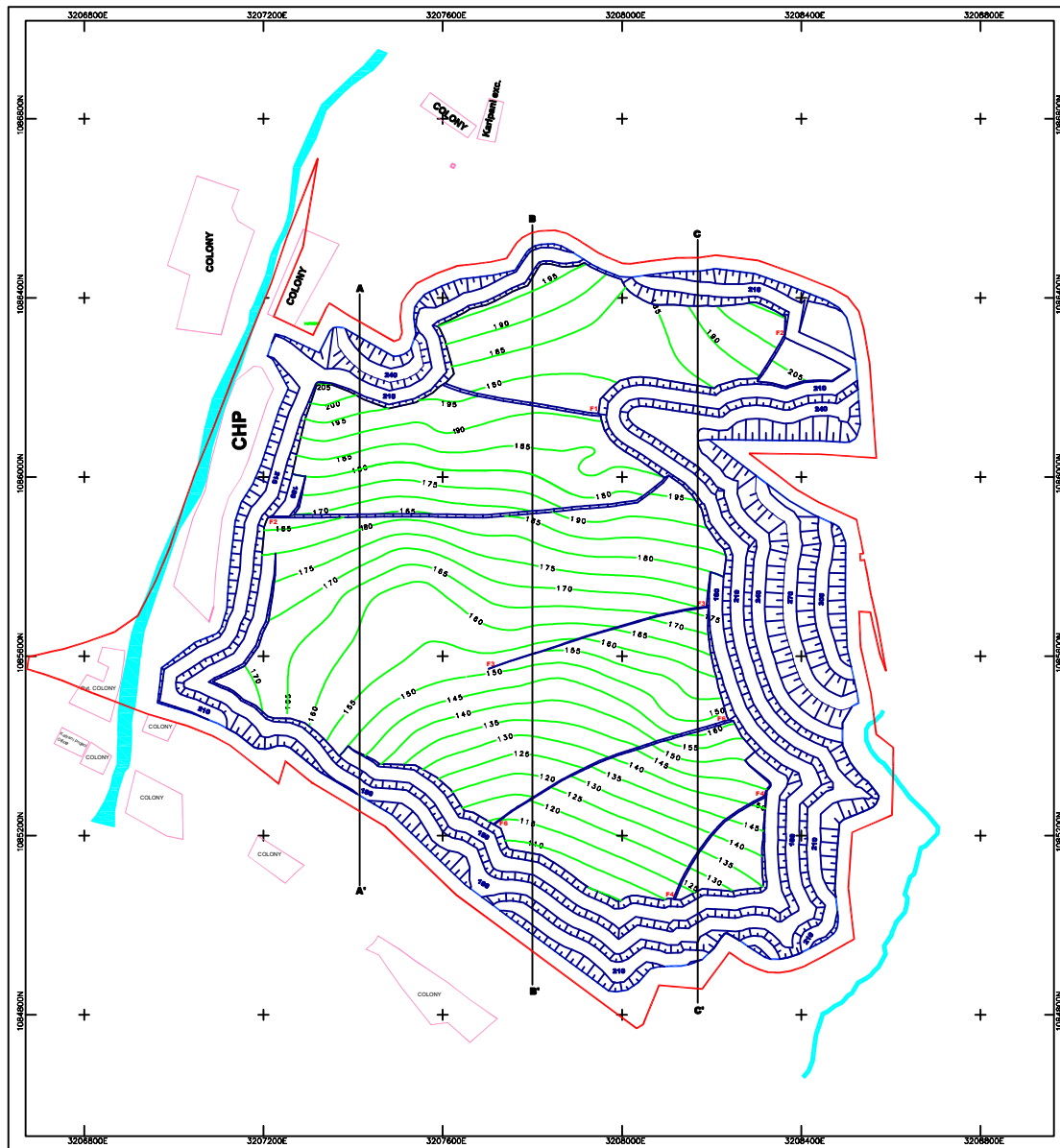
		Grading		
		Levelling and grading of highwall slopes & OB Dump		
	C B	Biological Reclamation & Plantation		
		Top soil Management		
		Grassing of OB dump		
		Planatation around virgin Area, safety zone, green belt, over external Dump and internal reclaimed area	15.00	11.70
		Plantation post care (including manpower)		
		Plantation over cleared area obtained after dismantling		
	D	Land scaping of the open space in leasehold area for improving its esthetic. Drain, Pipe lines, Peripheral road,gates, Viewpoints,cemented steps on bank	4.00	5.50
		Development of Agriculture land		
	E	Environment mitigation & management		
		Air Quality (Water tanker, Sprinkler & other Control measures)	12.00	1.50
		Water Quality (ETP & STP etc operating cost)		
		Manpower Cost and supervision		
	F	Post Closure Monitoring		
		Air Quality	0.00	3.20
		Water Quality		
		Power Cost		
		Manpower Cost and supervision		
	G	Entrepreneurship Development (Vocational/skill development training for sustainable income of affected people)	1.00	0.50
	H	Miscellaneous & Other measures like Golden Handshake, one time financial grant, alternative jobs, other services etc.	1.00	5.40
		Total	100.00	100.00

8.10.2

Financial Assurance: Amount to be deposited in Escrow account as a security against the mine activities to be carried out for the closure of the mine

ESCROW ACCOUNT	
Project Name	Selected Dhoril(lower) OCM
Project Area (Ha)	211.82
Escrow Amount per Ha. For OC Project as on April, 2019 (lakhs/ Ha)	9
WPI as on April 2019	121.10
WPI as on April 2021	132.00
Escrow Amount per Ha. For OC Project as on April 2021(lakhs/ Ha)	9.81
Current value of corpus as on April 2021 (lakhs)	2077.97
Amount deposited till 31.03.2021 (lakhs)(in mine closure account of SDQ-1 & SDQ-3	2453.52

The amount already deposited in the escrow account excluding interest is Rs. 2453.52 lakhs, which is much more than the current value of Corpus. So no additional amount is to be deposited in the escrow Account. So the annual corpus will be Rs. 0.0.



NOTES

SL. No.	PARTICULARS
01	PROPOSED LEASEHOLD
02	PROPOSED QUARRY BOUNDARY
03	PROPOSED QUARRY FLOOR
04	FLOOR CONTOUR SEAM-III

LEGENDS

SL. No.	PARTICULARS	SYMBOL
01	PROPOSED LEASEHOLD	
02	PROPOSED QUARRY BOUNDARY	
03	PROPOSED QUARRY FLOOR	
04	FLOOR CONTOUR SEAM-III	

REFERENCE DRAWINGS

SL. No.	NAME OF THE DRAWINGS	DRG. No.
01	SEAM FOLIO PLAN OF SEAM - III	RI-3/OCM/001031
02	LAND USE PLAN, SELECTED DHORI OCM	Oct. 2021
03	OGL PLAN, SELECTED DHORI OCM	Oct. 2021
04	GEOLOGICAL PLAN OF KALYANI OCP BLOCK	RI-3/OCM/001029

Copyright in these drawings is vested in CMPL. Unauthorised copying or use is not permitted.

1

CUSTOMER

CENTRAL COALFIELDS LIMITED

JOB TITLE

MINING PLAN FOR SELECTED DHORI OCM
(2.0 MTY)

JOB NO.

SUBJECT

FINAL STAGE QUARRY PLAN

ACTIVITY

NAME

DESIGNATION

SIGNATURE

DATE

CHECKED

BY

DATE

APPROVED

BY

DATE

SCALE

1 : 4000

CMPL

REGIONAL INSTITUTE - III

DATE

10/10/2021

REVISION

01

02

03

04

05

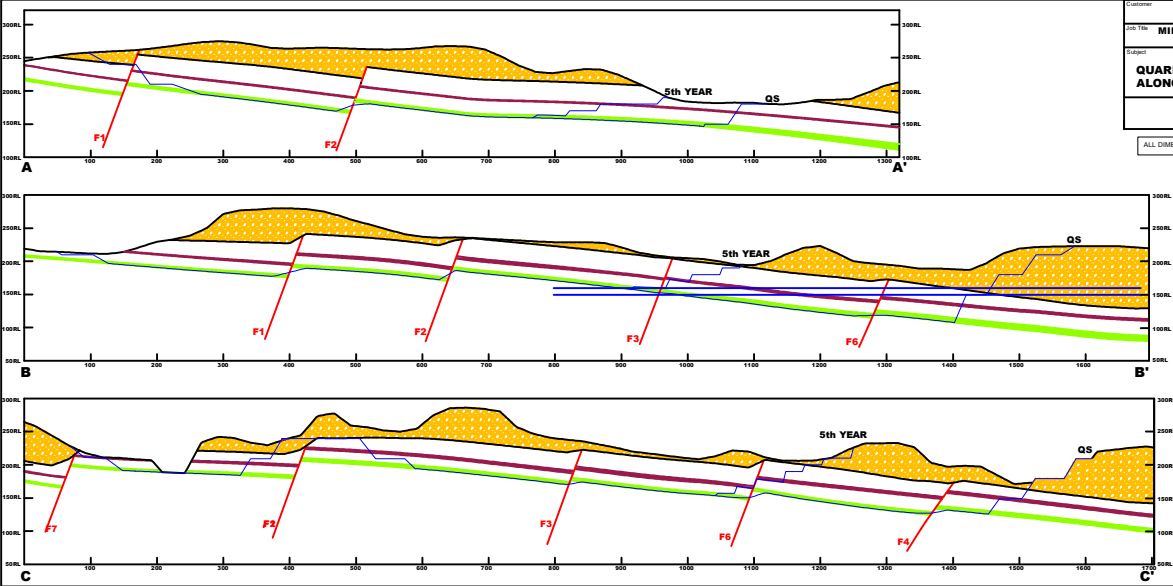
06

07

08

09

10



Customer					
CENTRAL COALFIELDS LIMITED					
Job Title					
MINING PLAN FOR SELECTED DHORI OCM					
(2.0 MTY)					
Job No.					
Subject					
QUARRY CROSS-SECTION					
ALONG AA', BB' & CC'					
CMPDI, R.I.-III					
A MINI RATNA COMPANY					
Scale					
1:3000					
Drawing No.					
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100					

ALL DIMENSIONS ARE IN METERS

Copyright in these drawings is vested in CMPDI. Unauthorised copying or use is not permitted.

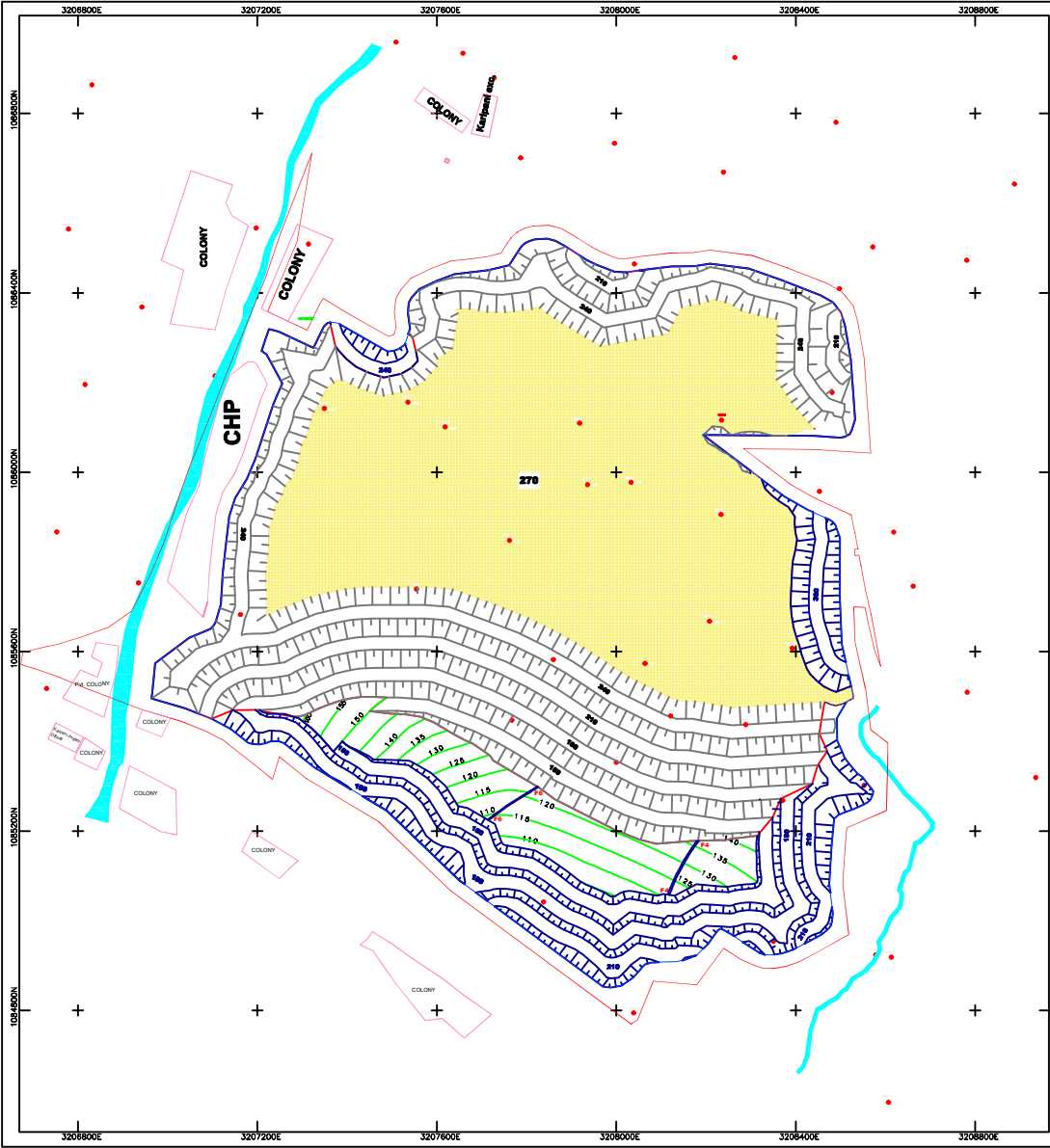
2

REFERENCE DRAWINGS

SL No.	NAME OF THE DRAWINGS	DRG. No.
01	SEAM FOLIO PLAN OF SEAM - III	RI-3/OCM001031
02	LAND USE PLAN, SELECTED DHORI OPENCAST MINE	Oct. 2021
03	OGL PLAN, SELECTED DHORI OCM	Oct. 2021
04	GEOLOGICAL PLAN OF KALYANI OCP BLOCK	RI-3/OCM001029

LEGENDS

SL No.	PARTICULARS	SYMBOL
01	QUARRY BOUNDARY	
02	SEAM- V	
03	SEAM- III	
04	FAULT	
05	OS DUMP	



NOTES

SL. No	PARTICULARS
	ALL DIMENSIONS ARE IN METERS

LEGENDS

SL No	PARTICULARS	SYMBOL
01	BOREHOLES	+
02	PROPOSED LEASEHOLD	—
03	PROPOSED QUARRY BOUNDARY	—
04	FLOOR CONTOUR SEAM-III	—
05	OS DUMP	—

REFERENCE DRAWINGS

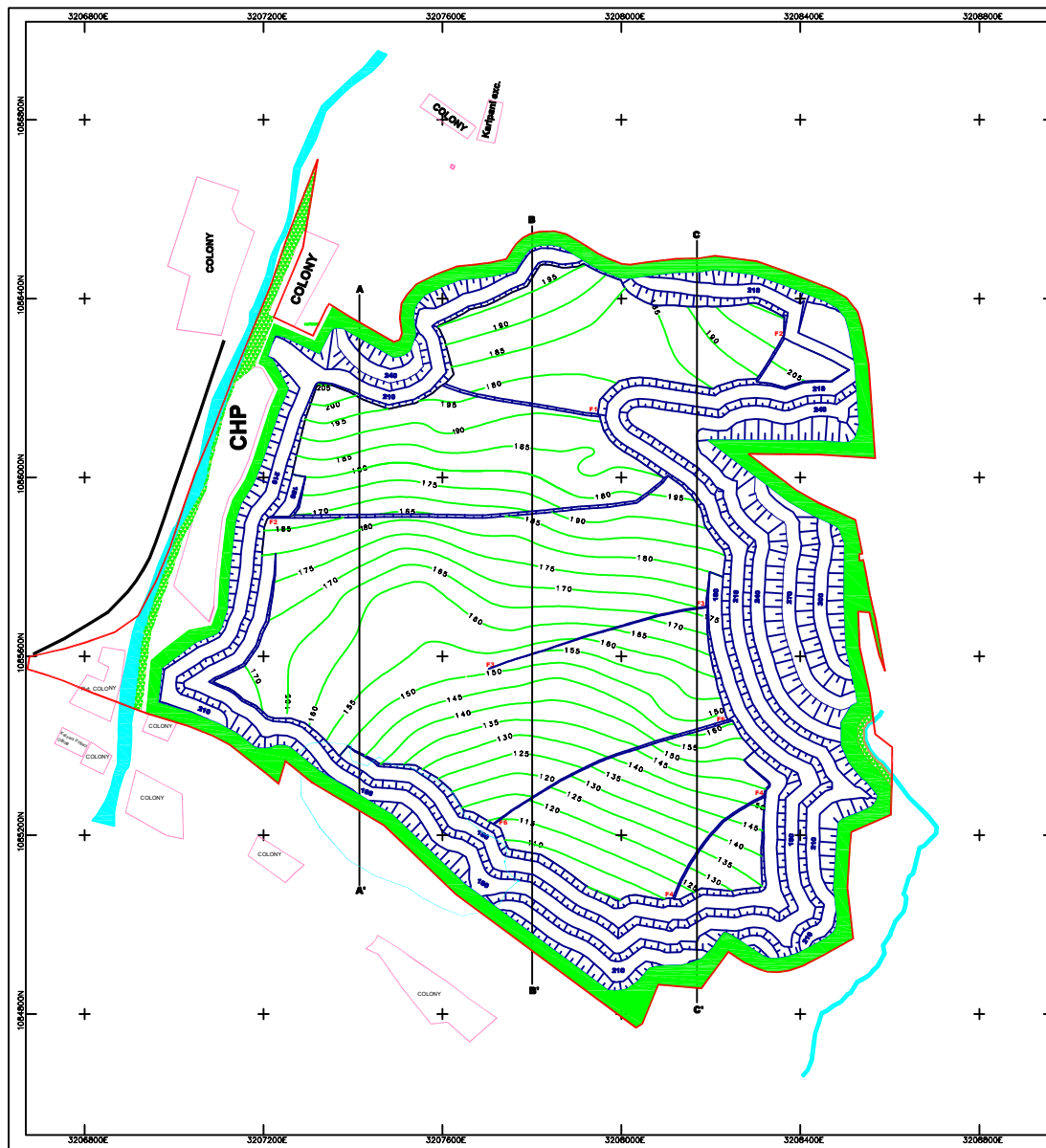
SL No	NAME OF THE DRAWINGS	DRG. No.
01	SEAM FOLIO PLAN OF SEAM - III	R1-3/OCM/001031
02	LAND USE PLAN, SELECTED DHORI OCM	Dated Oct. 2021
03	OGL PLAN, SELECTED DHORI OCM	Dated Oct. 2021
04	GEOLOGICAL PLAN OF KALYANI OCP BLOCK	R1-3/OCM/001029

3

Copyright in these drawings is vested in CMPDI. Unauthorised copying is strictly prohibited.

Customer		CENTRAL COALFIELDS LIMITED	
Job Title	MINING PLAN FOR SELECTED DHORI OCM (2.0 MTY)		Job No.
Subject	FINAL STAGE DUMP PLAN		
Author	Name	Designation	Signature
Checked	S. Chatterjee	GM (Mining)	10/09/21
Drawn	M. K. Sharma	GM (DCC)	10/09/21
Approved	S. Chatterjee	MD, RC-3	10/09/21
Scale	1:4000	Sheet	
Drp. No.	RC-3	00000000	Rev. No.

**cmpdi** REGIONAL INSTITUTE - III
A World of Ideas



NOTES

SL. No	PARTICULARS
	ALL DIMENSIONS ARE IN METERS

LEGENDS

SL. No	PARTICULARS	SYMBOL
01	PROPOSED LEASEHOLD	
02	PROPOSED QUARRY BOUNDARY	
03	PROPOSED QUARRY FLOOR	
04	FLOOR CONTOUR SEAM-II	
05	NALA	
06	EMBANKMENT	
07	INFRASTRUCTURE (CHP, COLONY)	
08	SAFETY ZONE/ GREEN BELT	

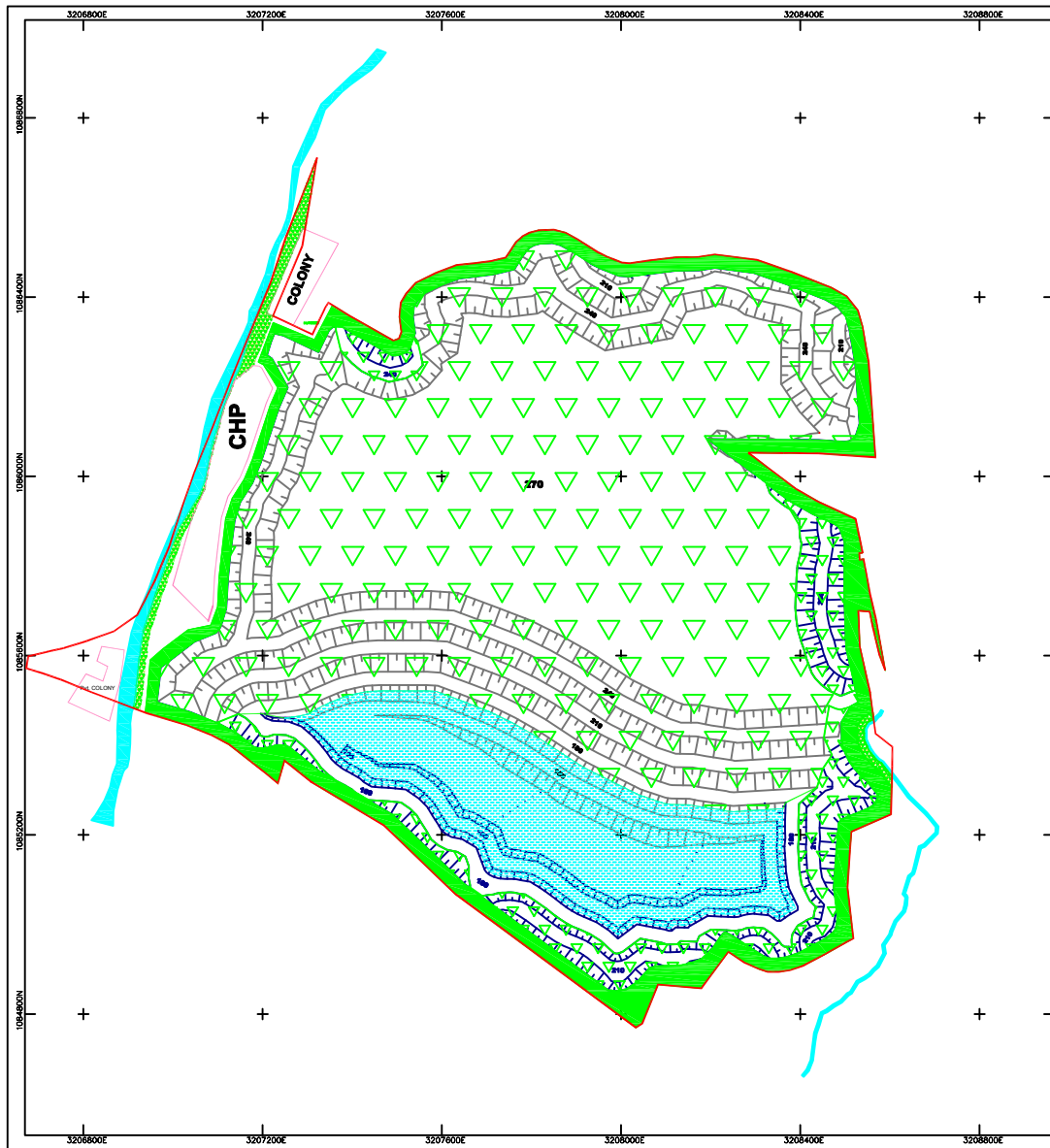
Sl. No	Key Land Use Details	
	Particulars	Area (Ha.)
1	Quarry	179.44
2	Infrastructure (CHP, Colony, Road)	5.06
3	Green Belt/Safety Zone	24.15
4	Tisri Nala and Joria Nala	1.48
5	Embankment against nala	1.69
Total Project Area		211.82

REFERENCE DRAWINGS

SL. No	NAME OF THE DRAWINGS	DRG. No.
01	SEAM FOLIO PLAN OF SEAM - III	RI-3/OCM001031
02	LAND USE PLAN, SELECTED DHORI OCM	Oct. 2021
03	OGL PLAN, SELECTED DHORI OCM	Oct. 2021
04	GEOLOGICAL PLAN OF KALYANI OCP BLOCK	RI-3/OCM001029

4

Customer		CENTRAL COALFIELDS LIMITED	
Job Title	MINING PLAN FOR SELECTED DHORI OCM (2.0 MTY)		Job No.
Subject	Author	Name	Designation
KEY LAND USE PLAN	Checked	S. Chandra	GM (Mining)
	Checked	M. K. Sharma	GM (OC)
	Approved	Chandrasekhar	MD, RL-3
	Scale	1 : 4000	
Drawn		Sheet	
Cmpdi REGIONAL INSTITUTE - III		Date No.	



NOTES

SL. No.	PARTICULARS
	ALL DIMENSIONS ARE IN METERS

LEGENDS

SL No.	PARTICULARS	SYMBOL
01	PROPOSED LEASEHOLD	
02	EMBANKMENT AGAINST NALA	
03	FINAL VOID FILLED WITH WATER	
04	FLOOR CONTOUR SEAM-III	
05	RECLAIMED INTERNAL DUMP	
06	INFRASTRUCTURE (CHP, COLONY)	
07	NALA	
08	SAFETY ZONE/GREEN BELT	

REFERENCE DRAWINGS

SL No.	NAME OF THE DRAWINGS	DRG. No.
01	SEAM FOLIO PLAN OF SEAM - III	RI-3/OCM/001031
02	LAND USE PLAN, SELECTED DHORI OCM	Dated Oct. 2021
03	OGL PLAN, SELECTED DHORI OCM	Dated Oct. 2021
04	GEOLOGICAL PLAN OF KALYANI OCP BLOCK	RI-3/OCM/001029

Post Mining Land Use Plan	
Particulars	Area (Ha.)
Internal dump reclaimed with Plantation	151.51
void filled with water	27.93
Infrastructure for Future Use	5.06
Plantation on Green Belt/Safety Zone	24.15
Tisri Nala and Joria Nala	1.48
Plantation on Embankment	1.69
Total Project Area	211.82

5

Copyright in these drawings is vested in CMPP. Reproduction or storage in any form is prohibited.

Customer: CENTRAL COALFIELDS LIMITED					
Job Title: MINING PLAN FOR SELECTED DHORI OCM (2.0 MTY)					
Project	Activity	Name	Designation	Signature	Date
POST MINING LANDUSE PLAN	Created	S. Chatterjee	CSO (Mining)		10/10/21
	Checked	Prasanna	CSO (OC)		10/10/21
	Reviewed	J. Chakraborty	CSO, RL-3		10/10/21
	Scale	1: 4000			
cmpp REGIONAL INSTITUTE - III The New Company			Drawn By: Date: Scale: Sheet No: Total No: Revision: Approved By: Date: Scale: Sheet No: Total No: Revision:		