Mine Plan and Mine Closure Plan
For

Bandha Coal Mine

SINGRAULI Coal Field
(Under Rule 22B of MCR 1960)
Singrauli
Madhya Pradesh

Project area 1850.94 ha

Targeted Capacity 5.00 MTPA
Peak Rated Capacity -7.5000MTPA

Prepared By
Atal Bihari

Contact No. - 9399465904
Email ID - rdri6.cmpdi@coalindia.in

APPLICANT
EMIL Mines And Mineral Resources Limited
Industry House, 18th Floor, 10 Camac Street, Kolkata 700017, West Bengal, India
CIN: U14290WB2020PLC236717

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Annexure	Approval of the Company Board	
Annexure	Copy of earlier approval of mining plan.	
Annexure	Plan / chart showing schedule of Implementation of Mine closure activities (progressive and final closure) with duration of important activities	
Annexure	Expert-Review Report carried out be an Accredited Mining Plan Preparing Agency (MPPA)	
Annexure	Other document (if any)	
Plates	Location plan	
Plates	Plan certified by Qualified person/ Accredited Mining Plan preparing agency (MPPA)if the project area is confined within the vested/allotted block boundary/existing mining lease and where the project area extends beyond the block boundary, a Plan certified by Qualified person/ Accredited Mining Plan preparing agency (MPPA)should be supported with a plan with cardinal co-ordinates duly certified by theMines and Geology Department of the concerned State Government. Plan in support of Annexure - II	
Plates	Printed copy of the KML file superimposed in the recent (not older than one year from the base date) dated satellite Image duly certified by Accredited Agency should also be attached. Note: The soft copy of the KML file shall also be part of the Soft copy of the mining Plan.	
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Plates	Layout of the panel for each system (like Longwall, Continuous Miner, Bord & Pillar, road header etc.) should be given (in case of UG Mines)	
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Chapter-1: Project Information

1.1 Introduction

S.No	Parameters	Details
1.1.1	Name of the Coal/Lignite Block	Bandha Coal Mine
1.1.2	Name of the Coalfield/ Lignite Field.	SINGRAULI Coal Field
1.1.3	Base date of Mining Plan/ Mine Closure Plan.	30/09/2021
1.1.4	Linked End Use Plant.	No end use plant is identified. Block is vested to M/s EMIL Mines And Mineral Resources Limited for Sale of Coal, including sale to affiliated and related parties, utilisation of coal for any purpose including but not limited to captive consumption, Coal Gassification, Coal Liquification and export of coal.
1.1.5	Distance of End Use Plant from the pit head of the project in âkmâ.	Not applicable
1.1.6	Mode of Coal Transport	By Railway and Road based on location of consumer

1.2 Location, Topography & Communication:

S.No	Parameters	Details
1.2.1	Location of coal deposit.	District-Singrauli, State-Madhya Pradesh Bandha Coal Block lies in Main Basin of Singrauli Coalfields in Singrauli district, Madhya Pradesh. Latitude 24deg 4' 17.375" N - 24deg 6' 51.064" N and Longitude 82deg 21' 39.764" E - 82deg 24' 56.668" E (Location Plan is given as Plate No. I). Bandha Block is covered in Survey of India Toposheet No.63 L/8 (R.F. 150000) and Open series Topo-sheet Nos. G-44W8 (M2, M4, N2, S1, S2, R1, R3, R4) (R.F 1 5,000).
	State	Madhya Pradesh
	District	Singrauli
1.2.2	Communication	The accessibility to the area is through NH75 Rewa-Ranchi National highway via Bargawan, which traverses in the east and runs almost along the boundary of Singrauli Coalfield. Bandha Coal Block is located about 60 km in west of Singrauli and about 25 km from Bargawan township. The block is connected with Rajmelan by about 25 km metalled road. The nearest railway station from Bandha Coal Block is Deoragram (located between Bargawan and Sarai railway stations), on Chopan-Singrauli-Katni-Jabalpur section of East-Central Railway. Devragram railway station is about 0.5-1 km distance from the Bandha block. The nearest township is Waidhan located at a distance of 50 km from the block, which is also district headquarter of Singrauli. The nearest airport is Varanasi which is about 300 Km from the block.
1.2.3	Availability of power supply & water etc.	Electricity will be provided by Madhya Pradesh State Electricity Board (MPSEB). The probable source of electricity may be Nagwa Sub-Station (about 15 Km), Waidhan sub-station (about 30 Km) or Morwa (about 35 Km). During the construction period water requirement will be fulfilled through ground water in accordance with NOC of Ground Water Authority.
1.2.4	Prominent physiographic features, drainage pattern, natural water courses, rainfall data, highest flood level.	About 43 percent of the Bandha block area is covered by forest land. The remaining approx. 57 percent of the block area is tenancy land and Govt. land. The surface exhibits a moderately undulating topography with reddish soil and sporadic occurrences of sandstone exposures. The general ground elevation of the block varies from 405.00m to 475.00m above MSL. The surface contours and other surface features / topography are given in Plate No.VII. The drainage pattern exhibited in the area is mainly dendritic to sub-dendritic. The drainages of the block are controlled by Bandha Nala and Kachanmuda Nala. Bandha Nala flows from south to north inside the block in north west corner of Bandha Block and east to west near Ujjaini village in northern side of the block. Only about 18 percent area of watershed of Bandha Nala constituted by Bandha coal block area and about 6.5 percent area of watershed of Bandha Nala enters from outside into bandha coal block. The flow pattern of Bandha Nala is as follows- Bandha Nala - Mahan Nadi - Gopad river - Sone river. Kanchanmuda nala originates from the Bandha Block and flows south to north inside the adjoining Amelia block and meets Kanchan dam in the north-east of the block. Only about 10 percent area of watershed of Kanchanmuda Nala constituted by Bandha coal block area. The flow pattern of Kanchanmuda Nala is as follows- Kanchanmuda Nala - Kanchan Dam - Rihand dam - Sone river. Maximum rainfall of the area in a day is about 180mm in last 25 year. HFL of the area is 408.34m above MSL. A hydrogeological study of the area is annexed as Annexure-XI.

1.2.5	Important surface features within the project area and major diversion or shifting involved.	A) There are 5 villages (Bandha, Tenduha, Pidarwah, Deori and Pachaur) located within the Block boundary of the Bandha coal block. 964 PAFs of these villages have to be rehabilitated as per R and R policy formulated as per guidelines of RFCTLARR-2013. B) The drainages of the block are controlled by Bandha Nala and Kanchanmuda Nala. Bandha Nala flows from south to north inside the block in north west corner of Bandha Block. Bandha Nala is to be strengthened by making embankment, etc. for safe operation of mine. A very small up-stream of Kanchanmuda falls within the Bandha block. Therefore, there is no need of any diversion of Bandha Nala and Kanchanmuda Nala and re-coursing may be done for restoring hydrogeological pattern of the area. A Hydrogeological study has been done and annexed as Annexure-XI. C) High Voltage Transmission Power line (400KV) passes almost centrally throughout the block. The power line has to be shifted suitably away from the Bandha Coal Block boundary as per statutory norms for safe operation of Bandha Coal Mine. D) Chopan-Singrauli Katni Rail line passes through extreme North Western Corner of the Bandha coal Block, which is not required to be diverted and may be utilized as rail connection for transportation of material. E) Some village roads and 11 KV electric power line etc. may be suitably shifted.

1.3 Details of the Allotment Agreement:

S.No	Parameters	Details
1.3.1	Name of the Allottee	EMIL Mines And Mineral Resources Limited
1.3.2	Details of allotment/vesting Order.	NA-104/5/2020-NA
1.3.2(B)	Allocation/Vesting Order Date	2021-03-03
1.3.3	Name and address of the Applicant	Industry House, 18th Floor, 10 Camac Street, Kolkata 700017, West Bengal, India CIN: U14290WB2020PLC236717
1.3.4	Name of the previous Allottee of the Block.	Not applicable
1.3.5	Starting date of the Mine as per CMDPA/CBDPA	03/09/2026
1.3.6	Rated capacity as per CMDPA/CBDPA	5.00
1.3.7	Production Schedule as per opening permission (meeting provisions of CMDPA if any).	OB removal from Bandha coal mine will start from 03.12.2026 after getting relaxation of 3 months under Covid Pandemic Relaxation scheme vide letter No. NA-710/5/2018-NA dated 19.06.2021 (annexed as Annexure- XV). Coal production from Bandha Coal Mine has been scheduled from 2028-29 (Yr-3).
1.3.8	End Use of Coal/ Lignite as per allotment order if any	No end use plant is identified. Block is vested to M/s EMIL Mines And Mineral Resources Limited for Sale of Coal, including sale to affiliate and related parties, utilisation of coal for any purpose including but not limited to captive consumption, Coal Gassification, Coal Liquification and export of coal.
1.3.9	Cardinal points coordinates of the Block Boundary	Cardinal Points files data shown below

Cardinal Points co-ordinates of the Block boundary :

Points	Latitude	Longitude		
		P-01	82° 24' 36.506" E	24° 4' 19.505" N
		P-02	82° 24' 27.758" E	24° 4' 18.757" N
		P-03	82° 24' 16.822" E	24° 4' 17.822" N
		P-04	82° 24' 11.594" E	24° 4' 17.375" N
		P-05	82° 24' 0.922" E	24° 4' 19.566" N
		P-06	82° 23' 53.502" E	24° 4' 21.090" N
		P-07	82° 23' 31.829" E	24° 4' 25.539" N
		P-08	82° 23' 0.298" E	24° 4' 32.011" N
		P-09	82° 22' 38.544" E	24° 4' 36.474" N
		P-10	82° 22' 39.486" E	24° 4' 39.912" N
		P-11	82° 22' 40.793" E	24° 4' 45.776" N
		P-12	82° 22' 41.252" E	24° 4' 50.707" N
		P-13	82° 22' 41.907" E	24° 4' 53.828" N
		P-14	82° 22' 43.933" E	24° 5' 0.688" N
		P-15	82° 22' 46.241" E	24° 5' 7.422" N
		P-16	82° 22' 48.015" E	24° 5' 11.828" N
		P-17	82° 22' 49.112" E	24° 5' 14.162" N
		P-18	82° 22' 49.057" E	24° 5' 14.697" N
		P-19	82° 22' 48.228" E	24° 5' 15.264" N
		P-20	82° 22' 47.410" E	24° 5' 15.890" N
		P-21	82° 22' 46.820" E	24° 5' 16.756" N
		P-22	82° 22' 46.910" E	24° 5' 21.883" N
		P-23	82° 22' 46.664" E	24° 5' 23.828" N
		P-24	82° 22' 45.999" E	24° 5' 24.128" N
		P-25	82° 22' 45.381" E	24° 5' 24.133" N
		P-26	82° 22' 44.716" E	24° 5' 25.034" N
		P-27	82° 22' 44.876" E	24° 5' 25.996" N
		P-28	82° 22' 45.189" E	24° 5' 27.232" N

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Points	Latitude	Longitude		
		P-29	82° 22' 45.278" E	24° 5' 28.538" N
		P-30	82° 22' 45.209" E	24° 5' 29.158" N
		P-31	82° 22' 45.087" E	24° 5' 29.403" N
		P-32	82° 22' 44.622" E	24° 5' 30.333" N
		P-33	82° 22' 42.262" E	24° 5' 33.933" N
		P-34	82° 22' 37.377" E	24° 5' 39.688" N
		P-35	82° 22' 34.219" E	24° 5' 43.358" N
		P-36	82° 22' 33.379" E	24° 5' 44.335" N
		P-37	82° 22' 24.282" E	24° 5' 55.657" N
		P-38	82° 22' 19.859" E	24° 6' 1.164" N
		P-39	82° 21' 39.764" E	24° 6' 51.064" N
		P-40	82° 24' 51.844" E	24° 6' 47.979" N
		P-41	82° 24' 51.758" E	24° 6' 45.950" N
		P-42	82° 24' 51.881" E	24° 6' 43.910" N
		P-43	82° 24' 52.138" E	24° 6' 39.650" N
		P-44	82° 24' 52.401" E	24° 6' 35.291" N
		P-45	82° 24' 52.863" E	24° 6' 28.530" N
		P-46	82° 24' 53.492" E	24° 6' 19.098" N
		P-47	82° 24' 53.833" E	24° 6' 13.582" N
		P-48	82° 24' 54.950" E	24° 5' 57.440" N
		P-49	82° 24' 55.237" E	24° 5' 52.584" N
		P-50	82° 24' 55.385" E	24° 5' 50.086" N
		P-51	82° 24' 55.533" E	24° 5' 45.525" N
		P-52	82° 24' 55.655" E	24° 5' 41.754" N
		P-53	82° 24' 56.084" E	24° 5' 28.989" N
		P-54	82° 24' 56.409" E	24° 5' 20.426" N
		P-55	82° 24' 56.668" E	24° 5' 12.768" N
		P-56	82° 24' 54.741" E	24° 5' 8.501" N
		P-57	82° 24' 54.419" E	24° 5' 7.747" N
		P-58	82° 24' 53.543" E	24° 5' 5.699" N
		P-59	82° 24' 52.144" E	24° 5' 2.332" N
		P-60	82° 24' 50.441" E	24° 4' 58.186" N
		P-61	82° 24' 50.441" E	24° 4' 55.738" N
		P-62	82° 24' 50.549" E	24° 4' 52.629" N
		P-63	82° 24' 50.719" E	24° 4' 47.713" N
		P-64	82° 24' 50.796" E	24° 4' 45.519" N
		P-65	82° 24' 50.845" E	24° 4' 44.104" N
		P-66	82° 24' 50.948" E	24° 4' 41.132" N
		P-67	82° 24' 51.095" E	24° 4' 36.903" N
		P-68	82° 24' 51.245" E	24° 4' 32.569" N
		P-69	82° 24' 51.466" E	24° 4' 26.211" N
		P-70	82° 24' 51.653" E	24° 4' 20.812" N
		P-71	82° 24' 51.657" E	24° 4' 20.799" N
		P-72	82° 24' 51.273" E	24° 4' 20.767" N
		P-73	82° 24' 36.506" E	24° 4' 19.505" N

1.4 Details of the Previous Approval of Mining Plan:

S.No	Parameters	Details
1.4.1	Date of approval :	
	Copy of earlier approval of mining plan Upload document	Annexure 4 : Document shown in annexure section.
1.4.2	Conditions, if any	
1.4.3	Scheduled year of start of production.	
1.4.4	Proposed year of achieving the targeted production	
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.	
1.4.8	Statutory obligations vis-à-vis compliance status in a tabular form	
1.4.9	Reasons for difference between the planned and actual production levels	

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1.5 PARAMETERS OF APPROVED MINING PLAN VIS-Ã-VIS PROPOSED MINING PLAN :

S.No	Block Area	Approved Mining Plan	Proposed Mining Plan
1.5.1	Geological Block Area HA		1850.9400
1.5.2	Geological Block Area Projectised HA		1350.00
1.5.3	Lease area HA		1850.9400
1.5.4	Project area HA		1850.9400
1.5.5	Life of the Project Yrs.		45
1.5.6	Minimum and Maximum Depth of working		90-230
1.5.7	Geological Block Area yet to be projectised “Ha”		500.94
1.5.8	Production Target MTP		5.0000
1.5.9	Seams Available As per GR		Seam VIII,Seam VII,Seam VI,Seam V-TOP,Seam V-BOT,Seam IV,Seam III-A,Seam III-COMB,Seam III-TOP,Seam III-BOT,Seam II-COMB,Seam II-TOP,Seam II-BOT

1.5.10	Seams not considered for Mining with Reasons		

S. No	Seams	Reason
1	Seam VIII	Unprojectised 14.76 Mt of reserve will be extracted by UG mining method
2	Seam VII	Unprojectised 90.37 Mt of reserve will be extracted by UG mining method
3	Seam VI	Unprojectised 49.49 Mt of reserve will be extacted by UG mining method
4	Seam V-TOP	Unprojectised 47.72 Mt of reserve will be extracted by UG mining method
5	Seam V-BOT	Non workable due to low seam thickness (<1.5m) in the entire block
6	Seam IV	Unprojectised 25.73 Mt of reserve will be extracted by UG mining method
7	Seam III-A	Non workable due to low seam thickness (<1.5m) in the entire block except few isolated small workable patches (>1.5m thickness), which are practically difficult to work.
8	Seam III-COMB	Non workable due to low seam thickness (<1.5m) in the entire block except one isolated workable patch (>1.5m thickness) in the rise side of the property. Approaching this workable will require huge drivage in thin zone area.
9	Seam III-TOP	Non workable due to low seam thickness (<1.5m) in the entire block.
10	Seam III-BOT	Non workable due to low seam thickness (<1.5m) in the entire block.
11	Seam II-COMB	Non workable due to low seam thickness (<1.5m) in the entire block.
12	Seam II-TOP	Non workable due to low seam thickness (<1.5m) in the entire block.
13	Seam II-BOT	Non workable due to low seam thickness (<1.5m) in the entire block.

1.5.11	Gross Geological Reserve Mte		610.61
1.5.12	Net Geological Reserve Mte		560.3800
1.5.13	Blocked Reserve Mte		64.3600
1.5.14	Minable Reserve Mte		207.3500
1.5.15	Extractable Reserve Mte		197.0000
1.5.16	% of Extraction/ recovery	%	35.1550%

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1.5.17	Reserve Depleted (till the base date) Reserves Mte		0.0000
1.5.18	Balance Extractable Reserve Mte		197.0000
1.5.19	Average Grade		4560.0000
1.5.20	OB in MM3		1922.0000
1.5.21	SR M3/te		9.7563
1.5.22	Mining Technology		Opencast Mining
1.5.23	Coal Beneficiation envisaged	NA	
1.5.24	Handling of Rejects		
1.5.25	Land use pattern “ Ha“		
1	Excavation Area		1315.0000
2	Top Soil Dump		0.0000
3	External Dump		350.0000
4	Safety Zone		15.0000
5	Other Use		60.9400
6	Infrastructure area		85.0000
7	Green Belt		15.0000
8	Undisturbed Area		10.0000
Total		0.0000	1850.9400
1.5.26	Reasons for revision		First Mining Plan

Chapter-2: Exploration,Geology, Seam Sequence, Coal Quality and Reserve

2.1 Details of the block

S.No	Parameters	Details	
2.1.1	Particulars of adjacent blocks: North, South, East, West	North	Southern boundary of Coal conveyor corridor for Amelia block which is 25m away from the northern boundary of Bandha North block
		East	Western boundary of Amelia block
		South	Some part of northern boundary of Chhatrasal block and some part are unblocked
		West	Unblocked Area
2.1.2	Location of the Block	District-Singrauli, State-Madhya Pradesh	
	State	Madhya Pradesh	
	District	Singrauli	
2.1.3	Area of the Block “Ha”	1850.94	
2.1.4	Area of the geological block projectized in “Ha” (Area of the geological block considered for liquidation of coal reserve)	1350.00	
2.1.5	Balance area yet to be projectized “Ha”	500.94	
2.1.6	Likely Reserve in the area yet to be projectized “Mte”	288.67	
2.1.7	Cardinal Point Co-ordinates of the non-coal/lignite bearing area/existing mining lease outside the allotted Geological Coal/Lignite block	Not applicable	
	(Duly certified in line with para 1.9 of the Guideline, if fresh minning lease required)	Cardinal Points files data shown below	
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/existing mining lease and Cardinal Points Co-ordinates of the Proposed area outside the non-coal/lignite bearing area outside the allotted Geological Coal/Lignite block	Annexure 2A	Document shown in annexure section.
		Annexure 2B	Document shown in annexure section.
		The Project area, Lease area and geological block area in Ha shall also be envisaged.	Project Area- 1850.94 Ha, Lease Area- 1850.94 Ha, Geological Block Area- 1850.94 Ha. Proposed Project is confined within the bounding co-ordinates of Bandha Coal Block provided in vesting order to M/s EMIL Mines And Mineral Resources Limited by MoC, India and also within the Bandha Coal Block boundary formulated by 73 cardinal points. A Certificate regarding this is annexed as Annexure-II.
2.1.9	KML file of the Proposed lease area, Project Area and geological block.	File attached in Plates section below.	
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, Project is confined within the allotted the block boundary.	
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	Not applicable	
2.1.12(1)	Year of Starting.	2026-27	
2.1.12(2)	Type of the Project.	Opencast project and it is under Implementation 2026-27 (C1/Yr-1)	

(Duly certified in line with para 1.9 of the Guideline, if fresh minning lease required) :

Document not found

2.2 EXPLORATION, GEOLOGY AND ASSESSMENT OF RESERVE

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S.No	Parameters	Details
2.2.1	Regional geological set up of the area, local geology, structure, stratigraphic sequence, characteristics of the litho-logical units (coal seams /partings/overburden).	

The Singrauli Coalfield lies in between Lat. 23deg46'37" N & 24deg13'17" N and Long. 81deg45'24" E & 82deg47' 50" E, covering an area of 2375 sq.km, is centrally located in India. It constitutes the northern most part of the Son-Mahanadi master Gondwana basin. Singrauli Coalfield is divided in two parts on the basis of geological setup, namely Moher sub-basin and Main basin, separated by a basement high almost parallel to the Kanchan River.

Stratigraphic Sequence of Main Basin:

Age	Formation	Lithology
Recent	Soil	Sandy soil
Cretaceous	Basic Intrusive	Dolerite dykes and sills
Late Triassic	Mahadeva	Coarse to medium grained ferruginous sandstone
Early Triassic	Panchet	Coarse to medium grained sandstone.
Late Permian	Raniganj	Fine to medium grained feldspathic wacke, carbonaceous shale and coal seams.
Middle Permian	Barren Measures	Flaggy sandstone.
Early Permian	Barakar	shale, sandstone, carb. shale and coal seams.
Early Permian to Late Carboniferous	Talchir	Fine grained sandstone diamictite, siltstone, pebbly sandstone and boulder bed.
----------Unconformity----------		
Pre Cambrian	Mahakoshal	Graphite, gneiss, quartzite, phyllites, schist and pegmatite.

The two main coal bearing horizons occur in Main basin of Singrauli coalfield namely Raniganj and Barakar formation. The coal seams in these formations comprises of coal litho units mainly coal, shaly coal, low carbonaceous shale, high carbonaceous shale, shale and sandstone lense in few places. The parting between the coal seams comprises of mainly fine to coarse-grained sandstone, ferruginous sandstone, shale, intercalations of shale and sandstone, sandy shale, shaly sandstone, high carbonaceous, clay and some dolerite intrusion in some places.

2.2.2	Local geology, Structure, Stratigraphic sequence, Characteristics of the litho-logical units (coal seams /partings/overburden)

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The Bandha Coal Block is in the North Eastern part of the Main Basin. During the course of drilling, formations from Raniganj to Barakar Formations have been intersected in the boreholes.

The Generalized Geological Sequence of Bandha Bock is:

Age		Formation	Lithology
Recent		Alluvium, Soil	Soil, Alluvium and Kankar
Per-mian	Lower Gondwana	Raniganj	Very fine grained to coarse grained sandstone, clay, shale, intercalation of sandstone and shale, carbonaceous shale, shaly coal and coal
		Barren Measures	Medium to coarse sandstone, flaggy sandstone, thin grey shale, clay and rarely carbonaceous matter
		Barakar	Fine to Coarse grained dirty white feldspathic sandstone, shale, carbonaceous shale, shaly coal and coal.
		Talchir	Shales, sandyshale, Sandstoneand Boulderbed.
---------- Unconformity ----------			
----------Metamorphics Basement----------			

Sequence of Coal Seams

Coal Seam/ Parting	Startigraphic Thickness Range (m) Nos of Bhs.	Min.	Max.	Effective Thickness Range (m) Nos. of Bhs.	Min.	Max.	Depth Range Min.	Max.
VIII	142	0.41 (CMSBD085)	3.65 (CMSBD049)	137	0.41 (CMSBD085)	2.91 (CMSBD049)	53.66 (CMSBD147) 55.09 (CMSBD147)	439.61 (CMSBD123) 440.54 (CMSBD123)
Parting	140	20.82 (CMSBD055)	45.86 (CMSBD123)					
VII	141	7.08 (CMSBD053)	16.81 (CMSBD055)	136	6.96 (CMSBD053)	15.24 (CMSBD055)	86.00 (CMSBD147) 99.40 (CMSBD147)	486.40 (CMSBD123) 501.13 (CMSBD123)
Parting	133	35.76 (CMSBD145)	46.34 (CMSBD077)					
VI	135	0.45 (CMSBD014)	3.25 (CMSBD003)	127	0.76 (CMSBD055)	3.25 (CMSBD003)	138.05 (CMSBD147) 139.65 (CMSBD147)	486.25 (CMSBD093) 488.95 (CMSBD093)
Parting	126	12.1 (CMSBD003)	28.16 (CMSBD006)					
V TOP	126	0.22 (CMSBD007)	3.57 (CMSBD011)	119	0.49 (CMSBD037)	3.55 (CMSBD0153)	164.45 (CMSBD147) 166.00 (CMSBD147)	438.24 (CMSBD153) 441.79 (CMSBD153)
Parting	115	0.80 (CMSBD085)	6.16 (CMSBD048)					
V BOT	116	0.05 (CMSBD0147)	1.59 (CMSBD070)	75	0.23 (CMSBD037)	1.59 (CMSBD070)	169.95 (CMSBD147) 170.00 (CMSBD147)	445.15 (CMSBD153) 445.59 (CMSBD153)
Parting	102	11.27 (CMSBD122)	27.52 (CMSBD059)					
IV	110	0.18 (CMSBD006)	2.62 (CMSBD096)	100	0.44 (CMSBD140)	2.62 (CMSBD096)	186.05 (CMSBD147) 187.15 (CMSBD147)	467.00 (CMSBD153) 469.25 (CMSBD153)
Parting	98	22.88 (CMSBD091)	42.12 (CMSBD007)					
IIIA	104	0.23 (CMSBD071)	2.28 (CMSBD007)	92	0.23 (CMSBD071)	2.28 (CMSBD007)	210.95 (CMSBD147) 211.55 (CMSBD147)	494.25 (CMSBD153) 495.68 (CMSBD153)
Part-ing	75	7.65 (CMSBD152)	24.02 (CMSBD084)					
III COMB	64	0.14 (CMSBD149)	5.40 (CMSBD068)	50	0.40 (CMSBD033)	4.39 (CMSBD068)	225.65 (CMSBD147) 226.75 (CMSBD147)	506.00 (CMSBD153) 507.05 (CMSBD153)
Parting (IIIA & III TOP)	13	12.97 (CMSBD101)	22.01 (CMSBD013)					
III TOP	13	0.2 (CMSBD089)	3.23 (CMSBD062)	11	0.43 (SBH006)	3.23 (CMSBD062)	250.02 (CMSBD076) 252.05 (CMSBD76)	338.94 (CMSBD016) 341.00

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								(CMSBD016)
Part-ing	13	1.08 (CMSBD016)	3.75 (CMSBD089)					
III BOT	13	0.16 (CMSBD101)	0.63 (CMSBD016)	5	0.30 (CMSBD013)	0.63 (SBH006)	253.99 (CMSBD076) 254.31 (CMSBD76)	342.08 (CMSBD016) 342.71 (CMSBD016)
Parting (III COMB & II COMB)	22	31.42 (CMSBD020)	57.60 (CMSBD015)					
Parting (III BOT & II COMB)	3	27.84 (CMSBD062)	51.55 (CMSBD074)					
II COMB	27	0.13 (CMSBD016)	1.36 (CMSBD062)	14	0.55 (SBH005)	1.36 (CMSBD062)	272.66 (CMSBD147) 273.36 (CMSBD147)	444.60 (CMSBD020) 444.87 (CMSBD020)
Parting (III COMB & II TOP)	12	35.45 (CMSBD009)	52.12 (CMSBD143)					
Parting (III BOT & II TOP)	3	27.53 (CMSBD075)	36.97 (CMSBD087)					
II TOP	18	0.30 (CMSBD144)	1.14 (CMSBD012)	12	0.50 (CMSBD007)	1.14 (CMSBD012)	290.17 (CMSBD012) 291.31 (CMSBD012)	449.47 (CMSBD154) 450.20 (CMSBD154)
Part-ing	18	1.24 (CMSBD018)	7.05 (CMSBD007)					453.13 (CMSBD154)
II BOT	18	0.25 (CMSBD007)	1.38 (CMSBD016)	14	0.65 (CMSBD075)	1.30 (CMSBD012)	272.66 (CMSBD147) 273.36 (CMSBD147)	454.39 (CMSBD154)

The main coal bearing horizon in Bandha Coal block is of Barakar formation. The coal seams in this formation comprises of coal litho units mainly coal, shaly coal, low carbonaceous shale, high carbonaceous shale, shale and sandstone lense in few places. The overburden and parting between the coal seams comprises of mainly fine to coarse-grained sandstone, shale, intercalations of shale and sandstone, sandy shale, shaly sandstone, high carbonaceous, clay etc.

Faults Description:

The block is traversed by only one fault i.e. F1-F1. F1-F1 fault is entering from north-western boundary of the block with throw amount of 30m and as the fault moves easterly the throw gradually reduce to 0m. The position of fault is shown in Geological plan (Plate No. V). Position of fault on the floor of seams are shown in floor contour plans and seam folio plans.

2.2.3	Geological Block Area “Ha”	1850.94
2.2.4	Status of Exploration of the block	

Bandha coal block is Explored block.

The detail drilling activity by CMPDIL commenced on July 2016 and completed on January 2021. The financial year-wise drilling is furnished below:

Year	Nos. of Borehole	Meterage Drilled (m)
2016-17	14	4332.00
2017-18	72	24961.00
2018-19	41	14242.00
2019-20	9	3544.00
2020-21	20	7691.00
Total	**156**	**54770.0**

The regional drilling by GSI was commenced on December 2001 and completed on January 2004 with a meterage of 3196.05m in 08 boreholes.

Detail of Agency wise drilling is given below:

Agency	**Period of Drilling**	**BH Series**	**No. of BHs**	Borehole meterage drilled within the block (m)
CMPDI	July'2016 to January 2021	CMSBD	156	54770.00
GSI	Dec'2001 to Jan'2004	SBH	8	3196.05
Total			164	57966.05

Seam Wise Drilled BH intersection is enlisted below:

Seam Name	No. of BH intersection	Non coring BH	BH with Part Thickness	BH Density (BH/Sq/Km)
VIII	142	20 BH with Geo-physical Logging	2	8.86
VII	141			8.81
VI	135			8.48
V TOP	126			8.00
V BOT	116			7.46
IV	110			7.13
IIIA	104			6.81
III	77			5.35
II	35			3.08

Some of the forest patches of the block has very less bore hole density due to non-availability of permission of drilling in Forest Area. These forest area require more exploratory drilling for more confidence in reserve estimation. After getting FC from MoEF&CC, further about 50 Nos. of BH of 17500m drilling has been proposed for drilling assuming Board and Pillar method of mining for future UG mining operation. About 17500m of drilling has been proposed in zone of indicated reserve in a phased manner starting from year 2026-27 to 2027-28. Proposed future drilling BHs have been marked on geological Plan given as Plate No. XXIV.

2.2.5	Area covered by "detailed" exploration within the block (sq. km)	18.5094
2.2.6	Whether entire area has been covered by a detailed exploration.	Yes Some patches of forest area require more exploratory drilling for more confidence in reserve estimation
2.2.7	No. of boreholes drilled within the block	164
2.2.8	Whether any further exploration/study is required or suggested and time frame in which it is to be completed	Some more drilling is required in forest area due to lesser borehole density (as per requirement) in some patches of forest area. Borehole may be drilled after getting forestry clearances from Forest Department. About 17500m of drilling has been proposed in zone of indicated reserve in a phased manner starting from year 2026-27 to 2027-28.
2.2.9	Year wise future programme of exploration	Years: 20262028 / No. of Bereholes: 50 / Meterage: 17500
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)	Seam VIII,Seam VII,Seam VI,Seam V-TOP,Seam V-BOT,Seam IV,Seam III-A,Seam III-COMB,Seam III-TOP,Seam III-BOT,Seam II-COMB,Seam II-TOP,Seam II-BOT

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2.2.12	Seams not considered for Mining with Reasons	Seam-VIII and VII are considered for opencast mining. All seams below Seam-VII are not favourable for Opencast mining due to high Stripping Ratio and dumping constraints. Seams below Seam-VII may be mined out by Underground Mining Method.
2.2.13	Dip of the Seam	2 deg to 8 deg NW

2.2.14 Seam wise thickness, depth and reserve

Seam	Thickness Range 'm'	Depth Range 'm	Net Geological Res "Mte"	Block Reserve Below "Mte"					Min Res "Mte"		Mining Losses	Ext Res "Mte"			As on base date "Mte"							Reason (For seams not considered for mining)
				High wall/ Batter	Nala/ River /Road	Barrier	Un-economic	Total Blocked	UG	OC		UG	OC	High wall	Depletion of Reserve			Balance Reserve				
															UG	OC	High wall	UG	OC	High wall	Total	
Seam VIII	0.41-3.65	53.66-439.61	51.26	6.31	0.37	0.25		6.9300		29.57	1.47		28.10					0.0000	28.1000			Unprojectised 14.76 Mt of reserve will be extracted by UG mining method
Parting	20.82-45.86							0.0000										0.0000	0.0000			
Seam VII	7.08-16.81	86.00-486.40	325.58	53.14	2.66	1.63		57.4300		177.78	8.88		168.90					0.0000	168.9000			Unprojectised 90.37 Mt of reserve will be extracted by UG mining method
Parting	35.76-46.34							0.0000										0.0000	0.0000			
Seam VI	0.45-3.25	138.05-486.25	49.49					0.0000										0.0000	0.0000			Unprojectised 49.49 Mt of reserve will be extacted by UG mining method
Parting	12.10-28.16							0.0000										0.0000	0.0000			

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Seam V-TOP	0.22-3.57	164.45-438.24	47.72					0.0000										0.0000	0.0000			Unprojectised 47.72 Mt of reserve will be extracted by UG mining method
Parting	0.80-6.16							0.0000										0.0000	0.0000			
Seam V-BOT	0.05-1.59	169.95-445.15	5.23					0.0000										0.0000	0.0000			Non workable due to low seam thickness (<1.5 m) in the entire block
Parting	11.27-27.52							0.0000										0.0000	0.0000			
Seam IV	0.18-2.62	186.05-467.05	25.73					0.0000										0.0000	0.0000			Unprojectised 25.73 Mt of reserve will be extracted by UG mining method
Parting	22.88-42.12							0.0000										0.0000	0.0000			

Seam III-A	0.23-2.28	210.95-494.25	22.49					0.0000										0.0000	0.0000			Non workable due to low seam thickness (<1.5 m) in the entire block except few isolated small workable patches (>1.5 m thickness), which are practically difficult to work.
Parting	7.65-24.02							0.0000										0.0000	0.0000			
Seam III-COMB	0.14-5.40	225.65-506.00	21.74					0.0000										0.0000	0.0000			Non workable due to low seam thickness (<1.5 m) in the entire block except one isolated workable patch (>1.5 m thickness) in the rise side of the property. Approaching this workable will require huge drivage in thin zone area.

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Parting	12.97-22.01							0.0000										0.0000	0.0000			
Seam III-TOP	0.20-3.23	250.02-338.94	2.68					0.0000										0.0000	0.0000			Non workable due to low seam thickness (<1.5 m) in the entire block.
Parting	1.08-3.75							0.0000										0.0000	0.0000			
Seam III-BOT	0.16-0.63	253.99-342.08	0					0.0000										0.0000	0.0000			Non workable due to low seam thickness (<1.5 m) in the entire block.
Parting	27.84-51.55							0.0000										0.0000	0.0000			
Seam II-COMB	0.13-1.36	272.66-444.60	8.19					0.0000										0.0000	0.0000			Non workable due to low seam thickness (<1.5 m) in the entire block.
Parting	35.45-52.12							0.0000										0.0000	0.0000			
Seam II-TOP	0.30-1.14	290.17-449.47	0.06					0.0000										0.0000	0.0000			Non workable due to low seam thickness (<1.5 m) in the entire block.
Parting	1.24-7.05							0.0000										0.0000	0.0000			

Seam II-BOT	0.25-1.38	272.65-453.13	0.21					0.0000										0.0000	0.0000			Non workable due to low seam thickness (<1.5 m) in the entire block.
Total			560.3800	59.4500	3.0300	1.8800		64.3600	207.3500		10.3500		197.0000						197.0000		197.0000	

S.No	Parameters	Details
2.2.15	Methodology of reserves estimation (also mention if any software package has been used).	

For furnishing account of reserves, Geological and Mineable Reserves in delineated Opencast Pit Boundary have been estimated as follows**:**

Gross Geological Reserve (GR): Gross Geological Reserve is reserve excluding inseam dirt band of thickness of 1m and above within vertical Geological Block boundary having minimum thickness of 1m.
GR**=** Seam Area X Effective Thickness X tonnage factor

Net Geological Reserve (NGR): Net Geological Reserve is reserve excluding inseam dirt band of thickness of 1m and above within vertical Geological Block boundary having minimum thickness of 1m with considering geological uncertainty factor.
NGR**=** Seam Area X Effective Thickness X tonnage factor x 0**.**9
A factor of 0**.**9 is adopted to account for unforeseen geological factor**.**

Mineable Reserve (MR): Mineable reserve is NGR within the delineated quarry boundary up to mineable coal seams having minimum thickness of 1m and excluding inseam dirt band of thickness of 1m and above
MR**=** Seam Area X Effective Thickness X tonnage factor x 0**.**9**.**

A factor of 0**.**9 is adopted to account for unforeseen geological factor**.**

Extractable Reserve (ER): A part of Mineable reserve is lost during process of exploitation of coal seam. Therefore, the part of MR that can be exploited techno-economically is termed as Extractable Reserve.

Extractable Reserve **(**ER**) =** Extraction Factor X MR
The Operational losses for proposed Bandha OCP has been considered as 5**%.** According, an extraction factor of 0**.**95 is adopted to account of mining losses**.**

MINEX software is being used for reserve estimation**.** Grade**-**wise, Seam**-**wise and Depth**-**wise Tonnage of coal is calculated using the Detailed Resource Reporting method of MINEX software**.** AUTOCAD is used for representation of the plan**.**

2.2.16	Average GCV “KCal/kg”

Grade of the Seam VIII varies from G7 to G17 (Avg. G12) and Grade of the Seam VII varies from G7 to G12 (Avg. G9). The overall grade of reserve proposed to be extracted by Opencast is 4560 (G-10).

2.2.17	Gross Geological Reserve of the block “Mte”	610.61
2.2.18	Net Geological Reserve of the block “Mte”	560.3800
2.2.19	Minable Reserve of the block “Mte”	207.35
2.2.20	Blocked Reserve “Mte”	64.3600
2.2.21	Corresponding extractable reserve of the block “Mte”	197
2.2.22	Percentage of Extraction	35.155
2.2.23	Reserve already depleted (Base date of Mining Plan)	0
2.2.24	Balance Reserve (as on Base Date))	197.0000

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Chapter-3: Mining

3.1 Mining Method

S.No	Parameters	Details
3.1.1	Existing method of mining if the mine is under operation	The Bandha coal block is a virgin block. The Bandha coal block is presently free from any mining activity.
3.1.2	Proposed method of mining with justification on suitability of method of mining	

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Opencast mining method is proposed for extraction of coal seam VIII and VII with consideration of geo-mining conditions. The effective thickness of the coal seam VIII is varies from 1.5-2.5m (Avg.-1.85m) and of seam VII is varies from 11.00-14.00m (Avg.-12.30m). The percentage of extraction of the thick coal seam VII is higher in case of opencast mining method as compare to underground mining method. The thickness of lower seams (from Coal Seam VI to Seam II) are less than 3m and lower seams also occur at higher depth. Therefore, inclusion of lower seams for extraction increases the stripping ratio and dump accommodation may not be technically feasible in opencast mining operation. Due to coal conservation and higher production capacity of 5 Mtpa, Opencast mining method is more justifiable upto which extent opencast mining operation is technically feasible. However, the extraction of left out coal from opencast of seam VIII and seam VII as well as lower seams may be done by suitable underground mining method.

While designing the mining system, safety at work places and technical feasibility of the system have been taken care of. On the basis of geo-mining characteristics of the deposit, mining system parameters like slope of the quarry batter, bench height, bench width, dump height, final dump slope and slope of the working benches have been decided as per DGMS guidelines and experience gained from NCL Mines of Singrauli coalfields.

Mine Boundaries

The delineated coal block boundary of Bandha coal block provided in Geological Report of Bandha Coal Block has been considered as lease hold boundary of Bandha Coal Mine. The mine boundary has been fixed considering following factors:

i. **Northern Boundary: Fixed leaving a barrier of 7.5m and additional 15m for service road and belt conveyor etc.**
ii. **Southern Boundary**: Fixed leaving a barrier of 7.5m and additional 15m for service road, drainage system and culverts etc.
iii. **Eastern Boundary: Fixed leaving a barrier of 7.5m and additional 15m for service road etc.**
iv. **Western Boundary: The western boundary has been fixed by optimising the pit to accommodate the excavated OB in dip side as external dump and backfield dump accommodation as internal dump.**

Mineable & Extractable Reserve, OBR, Band & Avg. Stripping Ratio:

Seam-wise Coal, OBR, Inseam dirt band and SR within Opencast quarry boundary is enlisted below:

SEAM	MR (Mt)	ER (Mt)	OB (Mm3)	SR (m3/t)	Band (Mm3)	Total OB (Mm3)	SR (m3/t)
Seam VIII	29.57	28.10	1558.20	55.45	0.00	1558.20	55.45
Seam VII	177.78	168.90	359.30	2.13	4.50	363.80	2.15
TOTAL	**207.35**	**197.00**	**1917.50**	**9.73**	**4.50**	**1922.00**	**9.76**

Mining Strategy

Mine Parameters

Sl. No.	Particulars	Unit	Along Strike working	Dip-Rise working	Total
1	Avg. Working Length of quarry along Surface	Km	2.50	2.00	4.50
2	Avg. Working Length of quarry along Seam VII floor	Km	2.00	2.00	4.00
3	Avg. Dip-Rise Width of quarry along Surface	Km	3.50	2.75	
4	Avg. Dip-Rise Width of quarry on Seam VII floor	Km	2.80	2.00	
5	Maximum depth of the Quarry from surface	m	230		
6	Quarry Surface Area				
	At Surface	Sq.Km	13.50		
	At Floor	Sq.Km	10.30		

A. General Scheme of Operations

The slope angle of the working benches is adopted as 80deg for coal and 70deg for OB, while slope angle of bench for OB dump is adopted as 37deg (natural angle of repose of OB material).

OB Excavation

The upper OB benches are proposed to be worked by 12-14 m3 Hyd. Shovels working in conjunction with 100T Rear Dumpers. The cut width of the OB Shovel benches has been adopted as 15m. The height of the OB shovel benches varies from 10-12m.

With two-way traffic along the bench, the width of benches has been proposed as 45m (15m cut width + 8m throw + 18m haul road + 4m safety berm) for OB working benches and 30m for non-working OB benches.

Coal Winning

Coal will be extracted by surface miner in conjunction with 3.5 m3 FE Loader in combination with 35T Dumper.

Mine Opening & Sequence of Operation

An inclined type of access Trench entry T1 has been excavated from North East corner of the block towards south in 1:16 gradient and exposed the roof of seam VIII in Yr-1 (Box-Cut) (Plate No. XXI-A). In the subsequent year Trench T1 advances and exposed the roof of seam VII and finally touch the floor of seam VII. This Trench (T1) will serve as main haul road for coal and material transportation.

Opencast mining operation has been proposed to develop mine for extraction of coal only in half of the strike (around 2.5 Km) in southern part of block by this access Trench T1. A truck receiving hopper has been provided at floor of Seam VII for receiving of coal from both the seam. Coal transportation from receiving hopper to surface along the Trench T1 has been provided by single stream of belt conveyor and after a transfer point, the belt conveyor connects the Ground Bunker. Mine will advance in dip side of the block along the strike in southern part in subsequent year of mining operation. This system of mining operation, mine entry and coal transportation will serve for the initial 30 year of mine operation.

After 30 year of Mine operation, another inclined type of access Trench entry T2 will be excavated from North West corner of the Opencast Mine Boundary towards east in 1:16 gradient and exposed the floor of seam VIII. This access trench T2 will connect the north east of the existing 30th year of the mine operation at roof of seam VII. Coal transportation form receiving hopper to surface along the Trench T2 has been provided by single stream of belt conveyor and after a transfer point, the belt conveyor connects the Ground Bunker. In subsequent year of mine operation, Mine will advance towards north side of the Bandha Coal Block along the dip rise of the proposed opencast mine. This system of mining operation, mine entry and coal transportation will serve from the 30th year to end of opencast mine operation (Plate No. XXI-F).

Drilling and Blasting

The elements of drilling for OB would be decided during the actual course of mining operations. However, based on the available data from the existing practices, the burden and spacing would be 8mx8.5m for the shovel benches for height of 10-12m with 200mm drill deployment.

B. Waste Disposal Techniques

Total volume of OB generated for extraction of 197.00 Mt coal will be 1922.00 Mm3 (including in seam band) with average striping ratio of 9.76 m3/t. The volume of OB to be handled in the Bandha Coal Mine is 1917.50 Mm3 including 16.50 Mm3 alluvium soil alongwith 4.5 Mm3 in-seam dirt band and 4.5 Mm3 additional alluvium soil from proposed external OB dump area. The total excavated 1926.50 Mm3 of waste material has been proposed to accommodate in internal and external dumps upto 560m RL and stacked alluvium soil will be spread over reclaimed dump.

In starting of the quarry operation, internal backfilling in excavated area is not possible due to unavailability of dumping space. The dump for the first 6 year of quarry operation is to be dumped in the proposed dip side external dump D2 and North side dump D1. From the 7th year to 25th year of quarry operation total excavated OB will be accommodated in External and Internal OB dump.

Orientation of mine working operation has been proposed to start changing from along strike operation to dip-rise of mining operation after 25th year of quarry operation, therefore internal and external OB dump is proposed to be flushed out together to maximise the OB dump accommodation.

In the 30th year of quarry operation, total 1378.65 Mm3 OB has to be excavated including 11.70 Mm3 of alluvium soil as well as additional 2.80 Mm3 in-seam dirt band and 4.5 Mm3 alluvium soil from external dump. This total excavated waste material has to be accommodated in external and internal dump. The external dump is proposed in the dip side of delineated quarry boundary i.e. west side of Bandha coal block and dip side of External OB dump (D2) will accommodate 254.70 Mm3 of waste OB material up to 560m RL. Internal backfilled dump will accommodate 1080.45 Mm3 of waste OB material up to 560m RL. 7.00 Mm3 of Top soil will be stacked for further spreading while 9.70 Mm3 alluvium soil spread over reclaimed dump at this stage. So there will be shortage of 36.50 Mm3 OB dump accommodation at the 25th year of quarry operation. Therefore, to overcome this dump accommodation shortage, another external dump (D1) of 36.50 Mm3 in north side within the quarry surface boundary has been proposed in initial stage of quarry operation. This external dump (D1) will be re-handled after 30th year of quarry operation and accommodate in external and internal dump (Plate No. XXI-E).

The produced alluvium soil of 21.00 Mm3 (16.50+4.50 Mm3) will be stacked in a separate alluvium soil dump for storage. This stacked alluvium soil will be used for spreading over the reclaimed dump during concurrent Mine closure activity.

In the final stage of dump plan, backfilled Internal OB dump will accommodate 1619.20 Mm3 of waste OB material and External OB dump D2 will accommodate 307.30 Mm3 of waste OB material. Out of the produced 21.00 Mm3 alluvium soil, 16.20 Mm3 will be spread over internal backfilled OB dump and 4.80 Mm3 on external dump D2 after its reclamation (Plate No. XXI-G).

As per CMR 2017, toe of any dump should be at least 100m away from any working. Hence, the dumping of proposed opencast should be planned keeping 100m away from the proposed locations of UG mine entries. Pit boundary has also been finalised after leaving the area for UG mine entries and other operations. The area for pit top infrastructure and locations of UG mine entries are marked on Master Plan (Plate No. XII).

A Conceptual note on Underground working is annexed as Annexure- XIV. About 17500m of drilling has been proposed in zone of indicated reserve to prove it in a phased manner starting from year 2026-27 to 2027-28. After completing the proposed drilling, a Revised Mining Plan and Mine Closure Plan incorporating details of liquidation programme of seams to be considered in UG mining will be submitted.

3.1.3	Coal production capacity proposed MTPA	5.0000
3.1.4	Justification for optimization Coal production capacity	

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No extra land is available for external dumping due to coal bearing area in all the sides of Bandha coal block. In West portion of the block i.e outside of the delineated quarry boundary and North side within the delineated quarry boundary are provisioned for external dumping for initial stage of mining. Therefore, the effective strike length for quarry is approximately 2-2.5 km at surface and depth of working mine varies from 90-230m. Considering the above facts and safety aspects, the rated normative capacity has been optimised to 5 Mtpa.

There is scope of enhancement in mine capacity by 150% by way of improvement in availability & utilization of equipment, additional OB outsourcing, etc. Thus, peak mine capacity will become 7.5 Mtpa (150% of normative production 5 Mtpa) and production life of the mine will reduce accordingly (MoC Guideline is annexed as Annexure-IX). As and when favourable geo-mining condition permits, peak capacity of 7.5 Mtpa may be produced by Bandha Coal Mine.

3.1.5	Calendar year from which the production will start	2028-29
3.1.6	Year of Achieving rated production	2031-32

3.1.7 Tentative Coal production Plan MT

Year		Coal Production Schedule			OB MM3	SR
Year of Operation	Calendar Year	UG	OC	Total		
1	2026-27				5.00	0
2	2027-28				15.00	0
3	2028-29	0.00	0.50	0.5000	18.20	36.4000
4	2029-30	0.00	1.75	1.7500	20.90	11.9429
5	2030-31	0.00	3.75	3.7500	30.95	8.2533
6	2031-32	0.00	5.00	5.0000	41.07	8.2140
7	2032-33	0.00	5.00	5.0000	41.07	8.2140
8	2033-34	0.00	5.00	5.0000	41.07	8.2140
9	2034-35	0.00	5.00	5.0000	41.07	8.2140
10	2035-36	0.00	5.00	5.0000	41.07	8.2140
11	2036-37	0.00	5.00	5.0000	43.36	8.6720
12	2037-38	0.00	5.00	5.0000	48.66	9.7320
13	2038-39	0.00	5.00	5.0000	48.66	9.7320
14	2039-40	0.00	5.00	5.0000	48.66	9.7320
15	2040-41	0.00	5.00	5.0000	48.66	9.7320
16	2041-42	0.00	5.00	5.0000	49.97	9.9940
17	2042-43	0.00	5.00	5.0000	55.37	11.0740
18	2043-44	0.00	5.00	5.0000	55.37	11.0740
19	2044-45	0.00	5.00	5.0000	55.37	11.0740
20	2045-46	0.00	5.00	5.0000	55.37	11.0740
21	2046-47	0.00	5.00	5.0000	55.71	11.1420
22	2047-48	0.00	5.00	5.0000	57.11	11.4220
23	2048-49	0.00	5.00	5.0000	57.11	11.4220
24	2049-50	0.00	5.00	5.0000	57.11	11.4220
25	2050-51	0.00	5.00	5.0000	57.11	11.4220
26	2051-52	0.00	5.00	5.0000	57.11	11.4220
27	2052-53	0.00	5.00	5.0000	57.01	11.4020
28	2053-54	0.00	5.00	5.0000	57.01	11.4020
29	2054-55	0.00	5.00	5.0000	57.01	11.4020
30	2055-56	0.00	5.00	5.0000	57.01	11.4020
31	2056-57	0.00	5.00	5.0000	57.01	11.4020
32	2057-58	0.00	5.00	5.0000	45.58	9.1160
33	2058-59	0.00	5.00	5.0000	45.52	9.1040
34	2059-60	0.00	5.00	5.0000	45.52	9.1040
35	2060-61	0.00	5.00	5.0000	45.52	9.1040
36	2061-62	0.00	5.00	5.0000	45.52	9.1040
37	2062-63	0.00	5.00	5.0000	41.34	8.2680
38	2063-64	0.00	5.00	5.0000	40.33	8.0660
39	2064-65	0.00	5.00	5.0000	40.33	8.0660
40	2065-66	0.00	5.00	5.0000	40.33	8.0660
41	2066-67	0.00	5.00	5.0000	40.33	8.0660
42	2067-68	0.00	5.00	5.0000	30.52	6.1040
43	2068-69	0.00	3.00	3.0000	17.95	5.9833
44	2069-70	0.00	2.00	2.0000	10.00	5.0000
45	2070-71	0.00	1.00	1.0000	2.05	2.0500
Note: Calendar Plan/Production Plan for the entire life of the mine.						

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<table>
<tr><td>3.1.8</td><td>Rated Capacity Mtpa</td><td>By OC : 5
By UG : 0
Overall : 5.0000</td></tr>
<tr><td>3.1.9</td><td>Life of the mine: Years</td><td>By OC : 45
By UG : 0
Overall : 45</td></tr>
<tr><td>3.1.10</td><td>Whether the proposed external OB dump site is coal/ lignite bearing: If so, whether coal/lignite below waste disposal area is extractable</td><td>Yes, Coal below external waste disposal area will be extracted by underground mining method. At the time of exhaustion of the opencast mine, underground potential of the block will be looked into. A Conceptual Note for Underground mining is enclosed as Annexure- XIV.</td></tr>
<tr><td>3.1.11</td><td>Whether the proposed external OB dump site is coal/ lignite bearing: If so, whether coal/lignite below waste disposal area is extractable</td><td>The whole area is coal bearing</td></tr>
<tr><td>3.1.12</td><td>Results of any investigation carried out for scientific mining, conservation of minerals and protection of environment; future proposals</td><td>Yes, Following Study are proposed 1) Geo-technical Study for safety purpose may be studied at suitable interval. 2) Study of applicability of High wall mining in the batters may be carried out. 3) Feasibility study of In-pit crushing and conveying for OB may be carried out. 4) Adoptability of newer technology may be studied continuously for improvement of Environment, Sustainability and governance in mining operation.</td></tr>
<tr><td>3.1.13</td><td>Type of Equipment/ HEMM proposed</td><td>
<table>
<tr><th>S.No.</th><th>Type of Equipment</th><th>Capacity</th><th>Unit</th><th>Population</th></tr>
<tr><td>1</td><td>Hyd Shovel</td><td>14</td><td>Cubic Meter</td><td>13</td></tr>
<tr><td>2</td><td>Rear Dump</td><td>100</td><td>Tonnes</td><td>106</td></tr>
<tr><td>3</td><td>Drill</td><td>250</td><td>mm</td><td>15</td></tr>
<tr><td>4</td><td>Dozer</td><td>410</td><td>Horsepower (HP)</td><td>13</td></tr>
<tr><td>5</td><td>Surface Miner (50 T Class)</td><td>2200.000</td><td>mm</td><td>1</td></tr>
<tr><td>6</td><td>Surface Miner T Class</td><td>3800.000</td><td>mm</td><td>1</td></tr>
<tr><td>7</td><td>FE Loader</td><td>3.5</td><td>Cubic Meter</td><td>5</td></tr>
<tr><td>8</td><td>Rear Dumper</td><td>35</td><td>Tonnes</td><td>14</td></tr>
<tr><td>9</td><td>Dozer with ripper</td><td>410</td><td>Horsepower (HP)</td><td>2</td></tr>
<tr><td>10</td><td>Drill</td><td>100</td><td>mm</td><td>1</td></tr>
<tr><td>11</td><td>Grader</td><td>550</td><td>Horsepower (HP)</td><td>2</td></tr>
<tr><td>12</td><td>Crane</td><td>75</td><td>Tonnes</td><td>1</td></tr>
<tr><td>13</td><td>Crane</td><td>40</td><td>Tonnes</td><td>2</td></tr>
<tr><td>14</td><td>Crane</td><td>10</td><td>Tonnes</td><td>2</td></tr>
<tr><td>15</td><td>FE Loader</td><td>6.4</td><td>Cubic Meter</td><td>1</td></tr>
<tr><td>16</td><td>Hyd. Shovel/ Backhoe</td><td>3.5</td><td>Cubic Meter</td><td>2</td></tr>
<tr><td>17</td><td>Wheel Dozer</td><td>460</td><td>Horsepower (HP)</td><td>2</td></tr>
<tr><td>18</td><td>Hyd. Shovel/ Backhoe</td><td>3.5</td><td>Cubic Meter</td><td>1</td></tr>
<tr><td>19</td><td>Dozer</td><td>850</td><td>Horsepower (HP)</td><td>2</td></tr>
<tr><td>20</td><td>Grader</td><td>280</td><td>Horsepower (HP)</td><td>2</td></tr>
<tr><td>21</td><td>Tipping Trucks</td><td>8</td><td>Cubic Meter</td><td>5</td></tr>
<tr><td>22</td><td>Water Sprinklers</td><td>70</td><td>KL</td><td>5</td></tr>
<tr><td>23</td><td>Scrapper</td><td>400</td><td>KW</td><td>2</td></tr>
<tr><td>24</td><td>Road Sweeping Machine</td><td>2500.000</td><td>mm</td><td>2</td></tr>
<tr><td>25</td><td>Mist Spray Gun</td><td>15</td><td>KL</td><td>2</td></tr>
</table>
</td></tr>
<tr><td>3.1.14</td><td>Upload Require Document</td><td>OC : NA
UG : NA</td></tr>
</table>

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Chapter-4: Safety Management

4.1 Safety Management

S.No	Parameters	Details
4.1.1	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.	

Stability of Benches, Quarry Highwalls and Spoil Dumps

During actual mining operation, systematic observations of the condition of benches, high wall slopes and spoil dumps should be carried out and the dimensions to be modified if necessary to suit the local conditions and scientific study of slope stability along with hydro-geological study of the area needs to under taken.

1. The slope angle of the working benches is adopted as 80 deg for coal and 70 deg for OB. Shovel-Dumper spoil dumps will be formed in benches of 30m in height and slope of individual dump bench will be 37deg.The total excavated 1926.50 Mm3 of waste material has been proposed to accommodate in internal and external dumps upto 560m RL and stacked alluvium soil will be spread over reclaimed dump The spoil dump height should not exceed 120m from average original surface level with an overall slope of around 28deg.The slope of spoil bank shall be determined by natural angle of repose of the material being deposited, in any case, shall not increase 37deg from horizontal. Any spoil bank exceeding 30m in height shall be benched so that no bench exceeds 30m in height and the overall slope shall not exceed 1 vertical to 1.5 horizontal. The width of berm between two adjacent OB benches will be 35m. Overall slope angle of dump will be around 28deg.No working or construction should be allowed within the 100m toe of the OB dump.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.Dump should be created in such a way that there is no chance of accumulation of water in and around the base of dump. It must be ensured that there is no stagnant water at the toe of dump and the top of the dump.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.Formation of dumping should be done in square or circular or any regular shape as far as possible.Proper drainage system should be provided to bring down rain water. Sump and pumping capacity should be sufficient to accommodate peak surface run-off and seepage of water.

xi) Gabion wall and garland drain should be constructed and maintained to trap the surface run-off and sludge coming from dump.

xii) Plantation and grassing should be done on top and slope of the dump respectively.

xiii) Regular monitoring is required to monitor development of tension crack, gullies, movement of soil mass, stagnation of water and any other unusual occurrence. Rate of movement of dump should be monitored by continuous monitoring system. Special attention should be given at curve area/turning area of the dump.

- General safety precautions are annexed as Annexure-XIII.

4.1.2	A Commitment from the Company Board that entire mining operation will be carried out as per the 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	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. A commitment from Company Board and from authorised official of the company is annexed as Annexure-III and Annexure- VIII respectively . Note- As per Regulation 106 of CMR2017 Before starting a mechanised opencast working, the owner and agent of the mine shall ensure that the mine, including its method of working, ultimate pit slope, dump slope and monitoring of slope stability, has been planned, designed and worked as determined by a scientific study and a copy of the report of such study has been kept available in the office of the mine. In the light of the Scientific Study of Slope Stability of Pit Slope and Dump slope, the elements of mining system will be modified during the actual mining operations depending upon the physical and mechanical properties of the rock. Strict implementation of safety norms of CMR-2017 and DGMS circulars must be followed during operation and modify the operation as per requirement.

Chapter-5: Infrastructure Facilities proposed and their Location

5. Infrastructure Facilities

<table>
<tr><th>S.No</th><th>Parameters</th><th colspan="3">Details</th></tr>
<tr><td>5.1</td><td>Mine infrastructure required</td><td colspan="3"><table>
<tr><th>S.No</th><th>Infrastructure to be reatin to be public use</th><th>Infrastructure to be dismantle/reclaimed</th></tr>
<tr><td>1</td><td>The required Mine Infrastructure will be constructed within the allotted Block boundary of Bandha Coal Block. The critical activities will start from year 2026-27 (PC-6/C-1). Following infrastructure will be constructed. 1) Service building 2) Workshop- Workshop comprises dumper and dozer repairing complex as well as E and M workshop. The Base Workshop of size 440mx170m is envisaged at north-west corner of the Bandha Block for the proper maintenance of HEMM. The base workshop is provided with 28 bays of size 10mx18m each for repairing of dumpers and 3 bays of size 10mx10m for repairing of Dozer and face equipment. A face workshop is also provided at the south-east corner of Bandha Block for day to day maintenance of HEMM. The face workshop comprises of 8 bays for repair and maintenance alongwith Washing Station. 3) Substation For power supply arrangement. 4) Coal Handling Plant 5) Railway siding along with RLS. 6) Statutory Buildings like magazine house, pit head bath, first aid center, rest shelter, fire-fighting room, pit/time office, weigh bridge control room, training center etc. 7) Common facilities like time and security office, fire-fighting station, car/scooter parking stand, canteen cum rest shelter etc. 8) Water Supply Arrangement- Water demand for different industrial uses are calculated under the following heads i) Washing of dumpers/dozers ii) For dust suppression of CHP iii) Firefighting requirements iv) Road watering v) Portable water requirement for manpower engaged in administrative complexes of the project. 9) Residential building complex. 10) ETP and STP. Following infrastructure will be retained to run underground mining activities - 1) Service building 2) Residential building 3) E and M workshop 4) Coal Handling Plant 5) Railway siding along with RLS. 6) Electrical Substation 7) Statutory Building 8) Common facilities 9) Water Supply arrangement 10) ETP and STP.</td><td>Dumper Dozer Workshop and face workshop will be dismantled after exhaustion of opencast mine. Pumps and pipes which will not be required, will be dismantled.</td></tr>
</table></td></tr>
<tr><td>5.2</td><td>Power supply & illumination</td><td colspan="3"></td></tr>
</table>

Power supply arrangement for Bandha Coal Mine has been proposed to receive power of 132 KV from nearby Sub-station of MPSEB (Nagwa - 15 Km, Morwa - 35 Km or Waidhan - 30 Km). The power shall be fed through 2 Nos. 132 KV overhead circuits on tower line through AAA conductor (panther equivalent). At 5 Mtpa stage, 3 Nos. 10 MVA, 132/6.6kV (each) has been proposed for power supply arrangement of Bandha Coal Mine for OB, Coal including CHP & office power supply etc.

To meet the maximum demand for additional loads coming under the coming years associated switchgears may be provided in coming years of quarry operation. The maximum demand will be achieved after considering 80% diversity and improving the system power factor to 0.98 by providing capacitor banks of adequate capacity.

5.3	Drainage & Pumping : Assessment of Volume of Water for Pumping, Pumping Capacity and Pump Selection

Pumps, Pipes and Fittings:

Pumping system has been designed for the volume of water accumulated in the mine considering maximum rainfall in a day as 280mm. Peak Pumping Quantity is worked out to be around 800000m3, the de-watering will be 5 days with 20 hr pumping every day. Thus pumping capacity required is around 8000m3/hr. The list of pump is given below:

Sl. No.	Item	Nos.
1	Main Pump 305lps, 150m head, 500 KW	8
2	Slurry Pump 150 m3/hr, 40m head, 37 KW	2
3	Face Pump 30 m3/hr, 20m head	3

Drainage of Water on Surface:

Fresh garland drains shall be made before every monsoon at the periphery of dump and active edge of the quarry to prevent the surface rain water to enter the quarry.

A sedimentation pond/lagoon shall be made and mine water will be discharged into it. After sedimentation of suspended particles, the fresh water will be discharged into river/nalla.

5.4	Coal Handling Arrangement: Brief detail of the CHP/ Mode of Dispatch, Coal quality and Coal staking and handling arrangement	The CHP capacity of 7.5 Mtpa is envisaged for the Bandha Coal Mine. The CHP comprises of 5Nos. of 100T truck receiving hopper along with 1 No. 300 TPH skid mounted 2 stage feeder breaker at the south-east side of the mine through access trench (T1) on floor of Coal Seam-VII. After 30 years of the mine operation, the truck receiving hopper position will be shifted at the north-east side of the mine through access trench (T2) on roof of Seam-VII. The coal from the truck receiving hopper will be stored at over-ground bunker of 12000 T capacity. Bunker will be divided into two partition of 8000T and 4000T for storing different grade of coal. The coal from the ground bunker will be fed to 1 No. of 4000 T Silo with RLS. Subsequently, the coal will be loaded to the Railway wagon through RLS. The belt conveyor length will be around 6 Km. The railway siding of 3 Km length is envisaged for evacuation of coal through Katni-Chopan railway line.
5.5	Coal washing and the proposed handling/ disposal of rejects	Not applicable

Chapter-6: Land Requirement

6.1 Land requirement

S.No	Parameters	Details
6.1.1	Total Land requirement for the mine in “Ha”. Indicative source of data.	

The land detail is provided by EMMRL as per Land schedule plan prepared by EMMRL. Break up of pre-mining land type (indicative) as per Land schedule

Sl. No.	Type of Land	Existing/Pre-mining Land Use	Area in Ha.
1	Tenancy Land	Agriculture	678.17
2		Township	93.76
3		Grazing	0.00
4		Barren	0.00
5		Water Bodies	2.03
6		Road	0.00
7		Commercial/ Other Use	2.13
		Sub Total	**776.09**
8	Govt. Non Forest Land	Agriculture	0.00
9		Residential	0.00
10		Township	0.00
11		Grazing	47.19
12		Barren	190.08
13		Water Bodies	34.78
14		Road	7.00
15		Railway	0.68
16		Other Use	9.63
		Sub Total	**289.35**
17	Forest Land	Revenue	3.55
18		Reserve	686.05
19		Protected	95.90
		Sub Total	**785.50**
20		Free Hold	0.00
		Grand Total	**1850.94**

Break up of pre-mining land type (indicative) and source of data.

S.No.	Land Type	Exisiting/pre-Mining Use	Area
1	Total	Total	1850.94
2	Forest Land	Reserve	686.05
3	Forest Land	Protected	95.90
4	Tenancy Land	Agriculture	678.17
5	Tenancy Land	Township	93.76
6	Tenancy Land	Water Bodies	2.03
7	Tenancy Land	Commercial/ Other Use	2.13
8	Govt. Non Forest Land	Grazing	47.19
9	Govt. Non Forest Land	Barren	190.08
10	Govt. Non Forest Land	Water Bodies	34.78
11	Govt. Non Forest Land	Road	7.00
12	Govt. Non Forest Land	Railway	0.68
13	Govt. Non Forest Land	Other Use	9.63
14	Forest Land	Revenue	3.55

6.1.2 During mining Land use details:

Type	Land use (Proposed)	Land Use (End of Life)	Land Use (Post Closure)						
			Agricultural land	Plantation	Water Body	Public/Company Use	Forest Land (Returned)	Undisturbed	Total

Excavation Area	1315								
Backfilled Area		1200	295	905					1200.0000
Excavated Void		115				115			115.0000
Without Plantation									
Top Soil Dump									
External Dump	350	350		350					350.0000
Safety Zone	15	15						15	15.0000
Haul Road between quarries									
Road diversion									
Diversion Or Below River Or Nala Or Canal									
Settling Pond	15	15			15				15.0000
Road And Infrastructure Area	85	85				85			85.0000
Rationalization Area	25.94	25.94		25.94					25.9400
Garland Drains	10	10				10			10.0000
Embankment									
Green Belt	15	15		15					15.0000
Water Reservoir Near Pit									
UG Entry	10	10				10			10.0000
Undisturbed OR Mining Right For UG	10	10						10	10.0000
Resettlement									
Pit Head Power Plant									
Water Harvesting									
Agricultural Land,Undisturbed OR Mining Right For UG									
Total	1850.94	1850.94	295.00	1295.94	15.00	220.00	0.00	25.00	1850.94

S.No	Parameters	Details
6.1.3	Surface features over the block area	A) There are 5 villages (Bandha, Tenduha, Pidarwah, Deori and Pachaur) villages located within the Block boundary of the Bandha Coal block. B) The drainages of the block are controlled by Bandha Nala and Kanchanmuda Nala. Bandha Nala flows from south to north inside the block in north west corner of Bandha Block. Bandha Nala is to be strengthened by making embankment, etc. for safe operation of mine. A very small up-stream of Kanchanmuda falls within the Bandha block. Therefore, there is no need of any diversion of Bandha Nala and Kanchanmuda Nala and re-coursing may be done for restoring hydrogeolgical pattern of the area. C) High Voltage Transmission Power line (400KV) passes almost centrally throughout the block. The power line has to be shifted suitably away from the Bandha Coal Block boundary as per statutory norms for operation of Bandha Coal Mine. D) Chopan - Singrauli Katni Rail line passes through North Western Corner of the Block
6.1.4	No. of villages/Houses to be shifted	No. of Village- 5 PAFs- 964
6.1.5	Population to be affected by the project	PAPs- 3551
6.1.6	Proposed Rehabilitation programme	R and R shall be done as per existing Laws.

6.2 DETAILS OF LEASE

S.No	Parameters	Details
6.2.1	Status of Lease	
Mining lease has been applied by EMMRL in June, 2021.		
6.2.2	Existing Lease Area “Ha”	Not applicable
6.2.3	Period for which Mining Lease has been granted/is to be renewed/ is to be applied. for.	30 Years
6.2.4	Date of expiry of earlier Mining Lease, if any .	Not applicable
6.2.5	Whether the lease boundary/ required boundary is same as mentioned in the allotment order.	Lease Boundary and Project boundary is same for Bandha Coal Mine, which is as per allotment order of Bandha Coal Block.
6.2.6	Lease Area (applied/ required) as per the Mining Plan under consideration (Ha)	1850.94
6.2.7	Whether the applied lease area falls within the allotted block.	Yes, applied lease area falls within the allotted block.
6.2.8	Area (Ha) of lease which falls outside the delineated Block Boundary/Existing Mining Lease.	Nil
6.2.8	Area (Ha) of lease which falls outside the delineated Block Boundary/Existing Mining Lease.	Nil
6.2.9	Details of outside area	Not Applicable
	Whether forms part of any other coal block	Not applicable
	Whether it contains any coal/lignite reserves.	Not applicable
	Purpose for which it is required, e.g. roads/ OB dumps/ service buildings/ colony/ safety zone/ others (specify).	Not applicable
6.2.10	Whether some part(s) of the allotted block has not been applied for mining lease	Not Applicable
	Total area in Ha of such part(s).	Total allotted area of Bandha coal Block has been applied for mining lease.
	Total reserves in such part(s). (Mt).	Not applicable
	Brief reasoning for leaving such part(s).	Not applicable

Chapter-7: Environment Mangement

7. Environment Mangement

S.No	Parameters	Details
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. The Mine closure cost has been estimated the base date of September 2021 and it has to be updated at the time of actual Escrow account opening. A certificate of commitment from Company Board and Project Proponent that the project will comply with the conditions stipulated in the Environmental Clearance and Forest Clearance is annexed as Annexure-III and Annexure- VIII respectively.

Chapter-8: Progressive & Final Mine Closure Plan

8.1.1 Land Degradation and restoration Schedule

Tentative Land Degradation and Technical Reclamation (Commutative Area Ha)									
Year/Stage		Land Degraded				Technically Reclaimed Area			
(Life of the mine plus post closure period)		Excav	Dump (Extn + Top Soil)	Infra/others	Total	Backfill	Dump (Extn + Top Soil)	Others	Total
Up to Base year	2025-26				0.0000				
C-1/Yr-1	2026-27	15	45	15	75.0000	0	45	0	45.0000
Yr-3	2028-29	95	115	50	260.0000	0	115	0	115.0000
Yr-5	2030-31	150	305	85	540.0000	0	305	0	305.0000
Yr-10	2035-36	355	420	85	860.0000	145	420	0	565.0000
Yr-15	2040-41	490	420	85	995.0000	300	420	0	720.0000
Yr-20	2045-46	670	420	85	1175.0000	450	420	0	870.0000
Yr-25	2050-51	910	420	85	1415.0000	580	420	0	1000.0000
Yr-30	2055-56	1130	430	85	1645.0000	810	430	0	1240.0000
Yr-35	2060-61	1190	360	85	1635.0000	1000	360	0	1360.0000
Yr-40	2065-66	1295	350	85	1730.0000	1145	350	0	1495.0000
Yr-45	2070-71	1315	350	85	1750.0000	1200	350	0	1550.0000
Post Closure									
Yr-50	2075-76	1315	350	85	1750.00	1200	350	0	1550.00

8.1.2 TentativeBiological Reclamation (Cumulative in “Ha”)

Year/Stage		Biologically Reclaimed Area					Forest land (Return)	Un Disturbed/ To be left for Public/com Use	Total
(Life of the mine plus post closure period)		Agriculture	Plantation	Water Body	Public/ Company Use	Total			
Up to Base year	2025-26								
C-1/Yr-1	2026-27	0	0	1	1	2.0000	0	40	42.0000
Yr-3	2028-29	0	0	3	4	7.0000	0	112	119.0000
Yr-5	2030-31	0	5	5	8	18.0000	0	120	138.0000
Yr-10	2035-36	0	80	12	13	105.0000	0	125	230.0000
Yr-15	2040-41	0	230	15	18	263.0000	0	128	391.0000
Yr-20	2045-46	0	320	15	22	357.0000	0	128	485.0000
Yr-25	2050-51	0	500	15	28	543.0000	0	128	671.0000
Yr-30	2055-56	0	650	15	33	698.0000	0	128	826.0000
Yr-35	2060-61	0	820	15	35	870.0000	0	128	998.0000
Yr-40	2065-66	0	950	15	38	1003.0000	0	128	1131.0000
Yr-45	2070-71	0	1100	15	40	1155.0000	0	245	1400.0000
Post Closure									
Yr-50	2075-76	295.00	1255.00	15	40.94	1605.94	785.50	245	1850.94

S.No	Parameters	Details

8.2	Post Closure Water Quality management (Existing water bodies available in the lease hold area; Measures to be taken for protection of the same including control of erosion, sedimentation, siltation, water.	The drainages of the Bandha coal block are controlled by Bandha Nala and Kanchanmuda Nala. Bandha Nala flows from south to north inside the block in north west corner of Bandha Block. Bandha Nala is to be strengthened by making embankment, etc. for safe operation of mine. A very small up-stream of Kanchanmuda falls within the Bandha block. Therefore, there is no need of any diversion of Bandha Nala and Kanchanmuda Nala and re-coursing may be done for restoring hydrogeological pattern of the area. Hydrogeological study report has been annexed as Annexure-XI. A garland drain of suitable dimension will be made all around the dump to catch all the run off water of the dump and will be taken to a sedimentation pond for settling of silt. The water collected will be completely reused for dust suppression (except in monsoon). Gabion walls and Retaining wall will be made at the toe of dumps to arrest any silt due to runoff. Regular monitoring of water quality of the nearby water bodies will be done as per norms and MoEFCC conditions.
8.3	Post Closure Air Quality management.	Air quality monitoring will be carried out throughout the life of mine and at post closure stage to assess the impact of proposed activity on the surroundings. No. of location of stations shall be fixed as per the MoEFCC norms and prevailing local factors.Air pollution control measures like development of greenbelt and avenue plantation, mobile water sprinkling along haul roads, fixed water sprinklers at stock yard, Crushers, CHP will be deployed to minimize the impact on surroundings.

8.4 Waste Management (Figures in MM3) (Tentative)

Year/Stage (Life of the mine plus post closure period)		OB Removal (Cumulative)			External Dump (Cumulative)		Internal Backfilling (Cumulative)		Embankment (Cumulative)	
		Top Soil	OB	Total	Top Soil	OB	Top Soil	OB	Top Soil	OB
Up to Base year	2025-26									
C-1/Yr-1	2026-27	0.20	4.80	5.00	0.20	4.80		0		
Yr-3	2028-29	1.50	37.00	38.50	1.50	37.00		0		
Yr-5	2030-31	3.00	88.25	91.25	3.00	88.25		0		
Yr-10	2035-36	8.35	291.55	299.90	7.80	212.00		80.10		
Yr-15	2040-41	10.30	527.60	537.90	7.80	250.10		280		
Yr-20	2045-46	12.40	796.95	809.35	7.80	286.50		515.05		
Yr-25	2050-51	14.40	1079.10	1093.50	7.80	286.50		799.20		
Yr-30	2055-56	16.20	1362.45	1378.65	7.00	291.20		1080.45		
Yr-35	2060-61	18.10	1599.70	1617.80	5.90	285.70		1326.20		
Yr-40	2065-66	20.20	1805.45	1825.65	4.60	307.30		1513.75		
Yr-45	2070-71	21.00	1905.50	1926.50	0	307.30		1619.20		
Post Closure										
Yr-50	2075-76	21.00	1905.50	1926.50	0	307.30		1619.20		

8.5 Top Soil Management – (Including Action plan for Top Soil management) (Tentative)

Year/Stage (Life of the mine plus post closure period)		Top Soil Removal Plan	Top Soil Used				
			Spreading Over Embankment	Spreading Over Backfill area	Spreading Over External OB Dump area	Used in Green Belt area	Total Utilised
Up to Base year	2025-26						
C-1/Yr-1	2026-27	0.20					
Yr-3	2028-29	1.50					
Yr-5	2030-31	3.00					
Yr-10	2035-36	8.35			0.55		0.55
Yr-15	2040-41	10.30		0.50	2.00		2.50
Yr-20	2045-46	12.40		0.90	3.70		4.60
Yr-25	2050-51	14.40		2.90	3.70		6.60
Yr-30	2055-56	16.20		5.50	3.70		9.20
Yr-35	2060-61	18.10		8.50	3.70		12.20
Yr-40	2065-65	20.20		10.80	4.80		15.60
Yr-45	2070-71	21.00		16.20	4.80		21.00
Post Closure							
Yr-50	2075-76	21.00		16.20	4.80		21.00

S.No	Parameters	Details
8.6	Management of Coal Rejects.	No washery has been proposed.
8.7	Restoration of Land used for Infrastructure.	The some of the infrastructures (Railway Siding, Ground Bunker, EM Workshop, Service Building, Magazine, ETP and Electrical Sub-station etc.) will be gainfully utilised for Underground mining operation after exhaustion of opencast mining operation (Yr-45).

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8.8	Disposal of Mining Machinery.	As the mine will continue as underground mine after Yr-45 the decision regarding mining machinery and infrastructure will be taken in the revised mining plan for underground mine. Dumper Dozer Workshop and face workshop will be dismantled after exhaustion of opencast mine. Pumps and pipes which will not be required, will be dismantled.
8.9	Safety & Security.	Safety measures proposed during operation and post closure stage include concrete wall along mine boundary, toe wall/gabion wall along OB dumps, fencing around water bodies, garland drains etc. Detailed Scientific Study needs to be carried out for exploring possibility of dumping of fly ash in backfilled are as per MOEFCC guideline.

8.10 Abandonment Cost and Financial Assurance.

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

Head	Activities	Unit	Quantity	Rate RS/Unit	Amount RS Cr
Progressive Closure	Water quality management	Ls	45	501672	2.26
	Air quality management	Ls	21600	25000	54.00
	Waste Management	M CUM	285.83	5000000	142.91
	Barbed wire fencing around dump	m	20935	770	1.61
	Barbed wire fencing around the pit	m	18600	770	1.43
	Filling of Void - Rehanding of Crown dump	MM3			
	Top Soil Management	MM3	21.00	40000000	84.00
	Technical And Biological Reclamation of Mined out of land and OB Dump	Ha	1255	550000	69.03
	Plantation over virgin area including green belt	Ha	40.94	550000	2.25
	Manpower Cost and Supervision	No.	30	517320	1.55
	Total wall around the dump	m	12000	3630	4.36
	Garland drain	m	1040	4400	0.46
	Garland drain around the dump	m	12000	4400	5.28
	Any other Activity				
Dismentaling of infrastrucure & Disposal/ rehabilitation of mining Machinery	Dismentaling of workshop	Ls			3.00
	Rehabilitation of the dismentaled fascilities	Ls			
	Dismentaling of pump and pipes/ other fascilities.	Ls			0.20
	Dismentaling of stowing bunker, provisioning of pumps for borewell pumping arrangement.				
	Dismentaling of UG equipment				
	Rearranging water pipeline to dump top park/Agriculture land	Ls			0.30
	Dismentaling of power lines.				
	Any other Activity				
Safety and Security	Barbed wire fencing around dump				
	Barbed wire fencing around the pit	m			
	Barbed wire fencing with Masonalry piller				
	Concrete wall with Masonalry pillers around the pit	m	4430	4070	1.80
	Securing air shaft and installation of borewall pump				
	Securing of incline				
	Concrete wall fencing around the water body				
	Boundary wall around the water body				
	Stabilisation (viz benching, pitching etc) of side walls of the water body				
	Toe wall around the dump				
	Garland Drain				

	Garland Drain around the dump				
	Drainage channel from main Ob dump	m	750	4400	0.33
	Any other Activity				
Technical and Biological Reclamation of mined out of land and OB Dump	Filling of Void	Ha			
	Top soil management	MM3			
	OB Rehandling for backfilling	MM3	36.50	67035000	244.68
	Terracing, blanketing with soil and vegetation of External OB Dump	Ha			
	Paripharel road, gates, view point, cemented steps on bank				
	Expenditure on development of Agriculture land	Ha	295	1100000	32.45
	Landscaping and Plantation	Ls			2.00
	Any other Activity				
Post Closure management and supervision	Power Cost	Ls			2.00
	Post mining water quality management	Ls			1.00
	Post mining air quality management	Ls			1.50
	Subsidence monitoring for 5 years	Ls			
	Waste management	Ls			1.50
	Manpower Cost and supervision	Ls			1.00
	Manpower Cost and supervision				
Others	Enterprenuership development(vocational/skill development training for sustainable income of affected people)	LS			1.00
	Golden Handshake/Retrenchment benefits to 100 employees of OC				
	Golden Handshake/Retrenchment benefits to 200 employees of UG				
	Onetime financial grant to societies/ institutions/ organisations which is dependent upon the project	LS			0.50
	Provide Jobs in other mines of company				
	Continuation of other services like running of school etc.	LS			1.00
	Any other Activity				
Total					663.40

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

WPI as on	Apr-19	121.10
WPI as on base date	30.09.21	135.90
Escalation rate of Closure cost		1.122
	UG	OC
Base Cost "Rs. Crs/Ha	0	0.09
Closure Cost "Rs. Crs/Ha"	0	0.101
Project Area "Ha"	0	1850.94
Amount to be depostied into Escrow Account "Rs. in Crs	0	186.945
Amount already deposited into Escrow Account "Rs. in Crs	0	0
Net Amount to be depositied into Escrow Account "Rs. in Crs	0	186.945
Rate of compounding of Annual Closure Cost		5.00%
Balance Life of the project "in Yrs	0	45
Annual Closure Cost "Rs. in Crs"	0	4.154
Amount to be deposited into Escrow Account after compounding @ of 5% "Rs. in Crs"		663.395

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Amount to be deposited into Escrow

Year	OC	Year	UG	Total
1	4.154			4.154
2	4.362			4.362
3	4.58			4.58
4	4.809			4.809
5	5.049			5.049
6	5.302			5.302
7	5.567			5.567
8	5.845			5.845
9	6.137			6.137
10	6.444			6.444
11	6.766			6.766
12	7.105			7.105
13	7.46			7.46
14	7.833			7.833
15	8.225			8.225
16	8.636			8.636
17	9.068			9.068
18	9.521			9.521
19	9.997			9.997
20	10.497			10.497
21	11.022			11.022
22	11.573			11.573
23	12.152			12.152
24	12.759			12.759
25	13.397			13.397
26	14.067			14.067
27	14.77			14.77
28	15.509			15.509
29	16.284			16.284
30	17.098			17.098
31	17.953			17.953
32	18.851			18.851
33	19.794			19.794
34	20.783			20.783
35	21.822			21.822
36	22.914			22.914
37	24.059			24.059
38	25.262			25.262
39	26.525			26.525
40	27.852			27.852
41	29.244			29.244
42	30.706			30.706
43	32.242			32.242
44	33.854			33.854
45	35.546			35.546
Total	663.395		0.000	663.395

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Annexures

Annexure 1A1

GOVERNMENT OF INDIA

MINISTRY OF COAL

OFFICE OF THE NOMINATED AUTHORITY

(Constituted under Section 6 of The Coal Mines (Special Provisions) Act, 2015 and authorised under section 26 of the Mines and Minerals (Development and Regulation) Act, 1957)

Shastri Bhawan, New Delhi

ALLOCATION ORDER

(under sub-rule (5) of rule 8 of the Coal Blocks Allocation Rules, 2017 read with section 11A of the Mines and Minerals (Development and Regulation) Act, 1957)

In re:	**Bandha Coal Mine** (the "block") particulars of which is specified in **Annexure 1**
Order no.:	NA-104/5/2020-NA
Date:	March 03, 2021
In favour of:	**EMIL Mines And Mineral Resources Limited,** incorporated in India under the Companies Act, 2013 with corporate identity number U14290WB2020PLC236717, whose registered office and principal place of business is at Industry House, 18th Floor, 10 Camac Street, Kolkata, West Bengal 700017, India (the "successful bidder")
For the purpose of:	Sale of coal, including sale to Affiliates and related parties, utilisation of coal for any purpose including but not limited to captive consumption, Coal Gasification, Coal Liquefaction and export of coal.

WHEREAS, the Nominated Authority has, in accordance with the provisions of the Mines and Minerals (Development and Regulation) Act (the "Act") and the Coal Blocks Allocation Rules, 2017 (the "Rules") conducted the auction of the block;

AND WHEREAS the successful bidder declared as successful bidder in accordance with provision of rule 5(7) of the Rules vide letter dated December 22, 2020 issued by Ministry of Coal is eligible to receive this allocation order with respect to the block;

Govt. of India
M/o Coal
Nominated Authority

AND WHEREAS the successful bidder has entered into a Coal Block Development and Production Agreement dated January 11, 2021 ("CBDPA") (as amended) with the nominated authority in accordance with the provisions of sub-rule (1) of rule 8 of the Rules;

AND WHEREAS the successful bidder has furnished a performance bank guarantee dated February 15, 2021 for an amount equal to INR 3,34,69,128.50 (Indian Rupees Three Crore Thirty Four Lakh Sixty Nine Thousand One Hundred Twenty Eight and Fifty Paise) issued by IndusInd Bank Ltd in accordance with the tender document and in accordance with the provisions of sub-rule (4) of rule 8 of the Rules.

NOW, THE NOMINATED AUTHORITY DOES ORDER:

1. On and from March 03, 2021 ("allocation date"), with respect to the block, the successful bidder shall be entitled to prospecting license OR mining lease OR prospecting license-cum-mining lease to be granted by the State Government with respect to the block, on making an application, with the terms and conditions of the CBDPA forming a part of such mining lease.

2. In accordance with provisions of sub-section (3) of the section 11A of the Act, the State Government shall grant the prospecting license OR mining lease OR prospecting license-cum-mining lease for the block to the successful bidder.

3. Hereinafter, the successful bidder shall be entitled to take possession of the block as specified in Annexure 1 without let or hindrance;

4. This allocation order is liable to be cancelled in accordance with the provisions of sub-rule (10) of Rule 8;

5. This allocation order is issued with the approval of the competent authority.

.....

(By the nominated authority)

Annexures:

Annexure 1: Particulars of the block

Name of Coal Mine	Bandha
Coal Field	Singrauli
Latitude	24° 04' 33" N - 24° 06' 47" N (Provisional)
Longitude	82° 22' 41" E - 82° 25' 09" E (Provisional)
Villages	Bandha, Tenduha
Tehsil/ Taluka	Singrauli & Deosar
District	Sidhi
State	Madhya Pradesh

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Annexure 2A

S.NO	Latitude	Longitude
1.0	24°06'52"N	82°21'39"E
2.0	24°04'17"N	82°21'39"E
3.0	24°04'17"N	82°24'57"E
4.0	24°06'52"N	82°24'57"E

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Annexure 2B

Annexure-II

CERTIFICATE

(As per Clause No. 1.8 of Guidelines for preparation, formulation, submission, processing, scrutiny, approval and revision of Mining Plan for Coal and Lignite Blocks issued by MoC, F. No. 34011/28/2019-CPAM dated 29.05.2020)

I, Atal Bihari, being the Qualified Person, recognized by the Board of EMMRL for preparation, formulation, submission of Mining Plan for Bandha Coal Block, do hereby certify that the Project of the Mining Plan for Bandha Coal Mine is confined within the vested / allotted block boundary.

It is also certify that geological block area in the proposed Mining Plan does not encroach any other block.

A conceptual plan envisaged in the proposed Mining Plan depicting the OB area, infrastructure locations and cardinal point co-ordinates of the block area is enclosed as Plate No- II

Atal Bihari
क्षेत्रीय निदेशक
सी.एम.पी.डी.आई. क्षे.सं.–6,
सिंगरौली

Atal Bihari
Regional Director
CMPDI, RI 6

Annexure-3A1

Annexure-III

ADITYA BIRLA

EMMRL

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED BY THE BOARD OF DIRECTORS AT THE MEETING NO. 03/2021-22 OF EMIL MINES AND MINERAL RESOURCES LIMITED HELD ON THURSDAY, 21ST OCTOBER, 2021 AT INDUSTRY HOUSE, 18TH FLOOR, 10, CAMAC STREET, KOLKATA-700017

"RESOLVED THAT the Board of Directors of EMIL Mines and Mineral Resources Limited ('EMMRL' or 'the Company'), (CIN: U14290WB2020PLC236717), the Block Allottee of Bandha Coal Mine as per Allocation Order No. NA-104/5/2020-NA Dated March, 03, 2021 as issued by the Nominated Authority, Ministry of Coal, Govt. of India, hereby accord their approval to the Mining Plan (Including Mine Closure Plan) and also furnish the following undertakings in accordance with the Annexure III of the Guidelines for preparation, formulation, submission, processing, scrutiny, approval and revision of Mining Plan for the coal and lignite blocks, circulated vide Office Memorandum Dated 29th May, 2020 of Govt. of India, Ministry of Coal:

1. The Mining Plan (Including Mine Closure Plan) of Bandha Coal mine covering an area of 1850.94 Ha (Geological Block) located in Singrauli Coalfield, District Singrauli, Madhya Pradesh is prepared by CMPDIL (a Subsidiary of Coal India Limited), and correctness of data used in preparation of the Mining Plan has been verified;

2. Details and eligibility of CMPDIL (a Subsidiary of Coal India Limited) and its Qualified Person (QP), Mr. Atal Bihari, Regional Director, Regional Institute - VI, CMPDIL with certification, have been verified;

3. Mining Plan (Including Mine Closure Plan) as prepared by CMPDIL has been accepted and is being recommended for approval;

4. The mine will be developed as per the Mining Plan, approved by Ministry of Coal and all other approvals, as required will be obtained from relevant authorities;

5. The entire mining operation will be carried out as per the Statutory provisions given under The Mines Act, 1952, The Coal Mines Regulations, 2017, The Environment (Protection) Act, 1986 and The Forest (Conservation) Act, 1980 and & wherever specific permission will be required, the Company will approach the concerned authorities;

6. The Company gives the Financial Assurance for implementation in accordance with the approved Mining Plan (Including Mine Closure Plan);

7. The entire Progressive and Final closure activities shall be implemented as per the approved Mining Plan (Including Mine Closure Plan) by the concerned competent authorities;

EMIL MINES AND MINERAL RESOURCES LTD. KOLKATA

EMIL Mines And Mineral Resources Limited
Regd. Office: Industry House, 18th Floor, 10, Camac Street, Kolkata 700 017, India
CIN: U14290WB2020PLC236717 | T: +91 33 4455 5500 | F: +91 33 4455 5537
E: emmrl.registered@adityabirla.com

Prepared By Atal Bihari On 30/10/2021

ADITYA BIRLA
EMMRL

8. The reclamation and rehabilitation work shall be carried out in accordance with the approved Mine Closure Plan and any modification (s) / amendment(s) which may be made in the mine Closure Plan by Ministry of Coal, from time to time;

9. The protective measures contained in the Mine Closure Plan including reclamation and rehabilitation works will be carried out in accordance with the approved Mine Closure Plan and Final Mine Closure Plan and will submit yearly report before 1st July of every year to the Coal Controller, Ministry of Coal, Government of India setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved Mine Closure Plans (Progressive and Final Closure); and

10. Company will obtain a Mine Closure Certificate from Coal Controller, Ministry of Coal, Government of India to the effect that the protective, reclamation and rehabilitation works carried out in accordance with the approved Mine Closure Plan / Final Mine Closure Plan and will surrender the reclaimed land to the State Government concerned.

RESOLVED FURTHER THAT the Common Seal of the Company, if required, be affixed to all such deeds, documents, forms, application, other writings as may be necessary/required for the aforesaid purpose in the presence of any two Directors; or any one Director and Mr. Sanjay Kumar Baid or Mr. Satya Prakash and Mr. Sanjay Kumar Baid, officials of the Company, who shall sign the same in token thereof."

Certified true copy
For EMIL Mines and Mineral Resources Limited

Krishna Fatesaria
Director
DIN: 06742199

EMIL MINES AND MINERAL RESOURCES LTD. KOLKATA

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Annexure 4

First Mining Plan

Annexure-IV is Not Applicable to this Mining Plan

Annexure-V

Schedule of Implimentation of Mine Closure Activities

TYPE OF ACTIVITY		TIME FRAME (YEARS)			
		C-1/Yr-1	to	Yr-45	Yr-46 to Yr-50
Head	Activities				
Progressive Closure	Water quality management				
	Air quality management				
	Waste Management				
	Barbed wire fencing around dump		Yr-5 to Yr-15		
	Barbed wire fencing around the pit				
	Top Soil Management		Yr-10		
	Technical And Biological Reclamation of Mined out of land and OB Dump				
	Plantation over virgin area including green belt				
	Manpower Cost and Supervision				
	Toe wall around the dump				
	Garland drain				
	Garland drain around the dump		Yr-5 -Yr-30		
Dismentaling of infrastrucure & Disposal/ rehabilitation of mining Machinery	Dismentaling of workshop				
	Dismentaling of pump and pipes/ other facilities.				
	Rearranging water pipeline to dump top park/Agriculture land				
Safety and Security	Concrete wall with masonry piller around the pit		Yr-10 to Yr-30		
	Drainage channel from main Ob dump		Yr-4 -Yr-30		
Technical and Biological Reclamation of mined out of land and OB	OB Rehandling for backfilling		Yr-32 to Yr-37		
	Expenditure on development of Agriculture land				
	Landscaping and Plantation				
Post Closure management and supervision	Power Cost				
	Post mining water quality management				
	Post mining air quality management				
	Waste management				
	Manpower Cost and supervision				
Others	Enterprenuership development(vocational/skill development training for sustainable income of affected people)		Yr-5		
	One time financial grant to societies/ institutions/ organisations which is dependent upon the project		Yr-15		
	Continuation of other services like running of school etc.				

Annexure 6

IndusInd Bank

Indusind Bank
INDBINBBXXX

Tel:1860 500 5004

RTGS

Transaction Details:

Release Date/Time:	**Friday, November 5, 2021 4:36:00 PM IST**
Company Name:	**48276610**
Product Code:	**Fund Transfer**
Sub Product Code:	**RTGS**
Type:	**New**
Tran Ref #:	**FT21110012107282**
Cust Ref #	**MPBandha**
Bank Reference:	**INDBR22021110500288480**
Issuing Bank Name:	**Indusind Bank**
Value Date:	**05/11/2021**
Fund Transfer Amount:	**INR 475,100.00**

Bank Message

Date/Time:	**Friday, November 5, 2021 4:37:00 PM IST**
Reporting Status:	**Successful**
Bank Reference:	**INDBR22021110500288480**

Comment from the Bank:

SUCCESS

General Details

Entity:		Tran Ref #:	FT21110012107282
Debit Account:	201004383971 EMIL MINES AND MINERAL RESOURCES LIMITED	Bank Reference:	INDBR22021110500288480
Bank:	Indusind Bank	Application Date:	05/11/2021
Product Type:	RTGS		

Transfer To Details

Beneficiary Name:	Bharat Kosh	Bank Name	RESERVE BANK OF INDIA
Credit Account:	10599101002	Branch Name:	PAD MUMBAI

Transaction Details

RTGS

Transaction Amount:	475,100.00	Transfer Date:	05/11/2021
Cust Ref #	MPBandha		

Prepared By Atal Bihari On 30/10/2021

Annexure 7

TO WHOM IT MAY CONCERN

The Mining Plan & Mine Closure Plan of Bandha Coal Mine Coal Mine formulated by Qualified Person-Atal Bihari, QCI Number- which was sent for expert review to Mining Plan Preparing Agency-Indian Mine Planners and Consultants, QCI Number- NABET/APA-MPPA/IA/002 DT. 28TH JANUARY2021 .

The Mining Plan & Mine Closure Plan of Bandha Coal Mine Coal Mine has been review from Technical and administrative angle and has found to be prepared in line with the guideline for formulation, processing, scrutiny and approval of Mining Plan and Mine Closure Plan circulated vide OM dated 29th May 2020. The subject mining plan is found to be in order and is recommended for consideration of the Approving Authority for approval.

.

Digital Signature

Indian Mine Planners and Consultants

GE61, Rajdanga Main Road, Kolkata - 700107

NABET/APA-MPPA/IA/002 DT. 28TH JANUARY2021

7909060885

Prepared By Atal Bihari On 30/10/2021

Additional Annexure-8

Annexure-VIII

S. R. 7458/604
Place Waidhan
Date 22/10/2021

A certificate of commitment from Project Proponent that the project wil l comply with the conditions stipulated in the Environmental Clearance and Forest Clearance

I, Bacha Prasad son of Shri Santlal Prasad, resident of Flat No-E-1204A, Amrapali Princely Estate, Sector-76, Noida, UP, do hereby solemnly affirm and swear on behalf of EMIL Mines And Mineral Resources Limited (EMMRL) as under:-

1. That Nominated Authority vide its letter dated 28th December' 20 had declared EMMRL as successful bidder for Bandha Coal Mine and subsequently Allocated the Block vide order number NA -104/5/2020-NA dated 03.03.2021 for commercial coal mining over an area of 1850.94 Hectares.
2. That, prior environment clearance and Forest Clearance are being taken for the said mining area as per the provisions of Environment Impact Assessment Notification, 2006 (hereinafter called as "EIA Notification, 2006") and the Forest (Conservation) Act 1980 respectively.
3. That we are aware of the scoping and appraising of my Environmental Clearance (EC) and Forest Clearance applications are subject to the condition(s) that we will follow all the Rules, Regulations, Bye-laws made thereunder from time to time related with the Mining operations and its surroundings that we have proposed in the Mining plan. We are also aware that the above Rules, Regulations, Bye-laws made thereunder can be from any Governmental department which is directly or indirectly related to the Mining operations and/or ancillary operations of mining aforesaid.
4. We are aware that I must follow the orders made there under if any by any Hon'ble court(s), Government Orders / Letters / Directions of Govt. of Madhya Pradesh, Notifications /Office Memorandums of by Ministry of Environment, Forests & Climate Change (MoEF&CC), or/and publications, amendments made there under if any from time to time.
5. We are also aware that the present appraising of Environmental Clearance (EC) and Forest application will be subjected to changes if any, depending on the legal outcomes, amendments in statute(s) and/or policy changes.
6. That we undertake to comply with all the statutory requirements for EC &FC and 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

NOTARIAL CANCELLED NOTARIAL

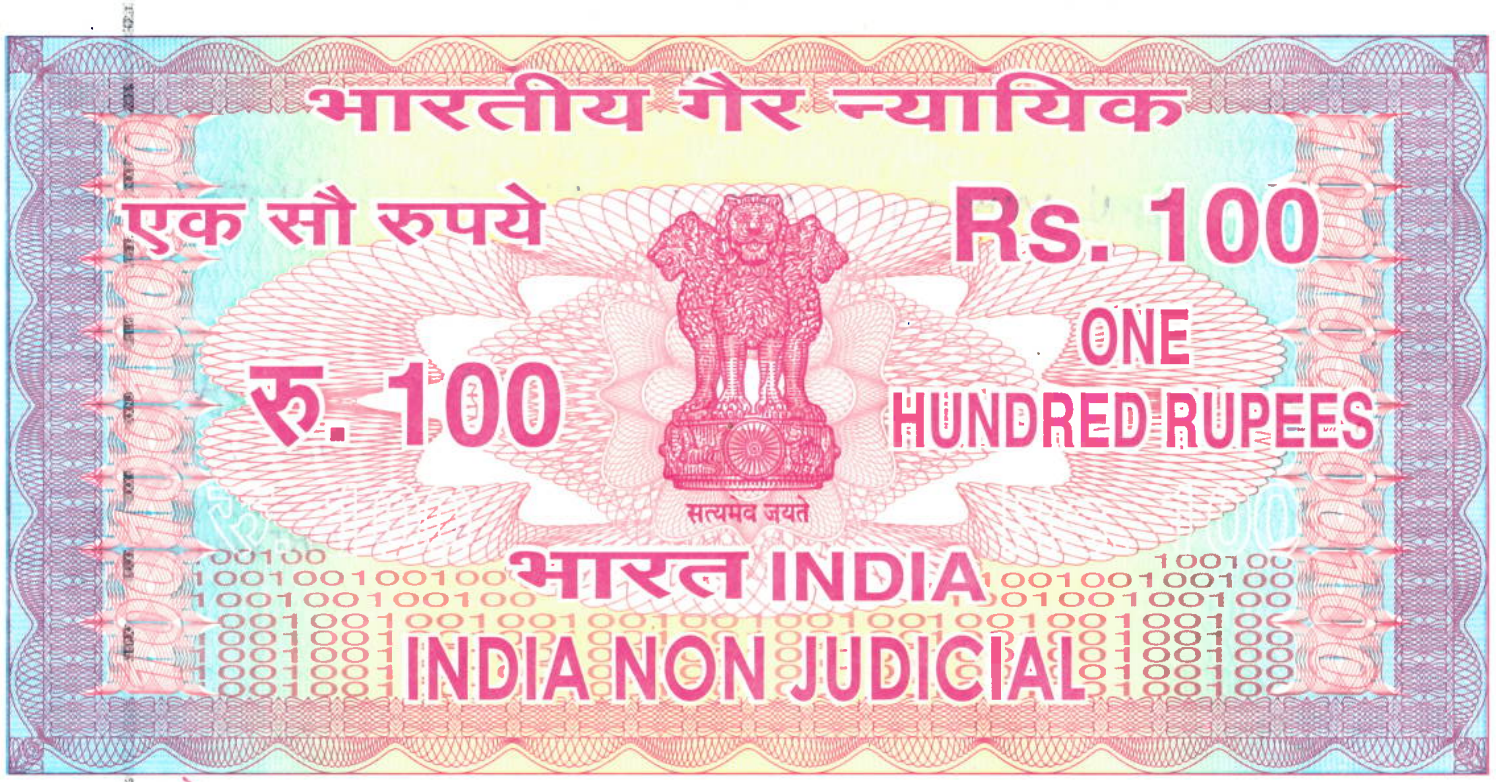
NOTARIAL Stamp Rs. 10-00 Affixed

Sig Of Deponent Executent

Ramashankar Shah Advocate NOTARY Waidhan, Distt-Singrauli (M.P.)

Identified by

Prepared By Atal Bihari On 30/10/2021



मध्य प्रदेश MADHYA PRADESH

BP 601601

S. R. 74502602

Place Waidhan

Date 22/10/2021

Ramashankar Shah
Advocate/NOTARY
Waidhan, Distt.-Singrauli (M.P.)

Prepared By Atal Bihari On 30/10/2021

Annexure-VIII

13830
22/10/2021

EML MINES AND MINERAL RESOURCES LIMITED

Aabha Shan
STAMP VENDER
DISTT COURT WAIDH

Prepared By Atal Bihari On 30/10/2021

Additional Annexure-9

Annexure- IX

F. No. 34011/28/2019-CPAM
Government of India
Ministry of Coal

Shastri Bhawan, New Delhi
The 29th May 2020

Office Memorandum

Subject: Guidelines for Preparation, Formulation, Submission, Processing, Scrutiny, Approval and Revision of Mining plan for the coal and lignite blocks.

Undersigned is directed to state that the guidelines for formulation of Mining plan and Mine Closure Plan has been amended. It has been decided by the Government that all coal (including lignite) mining operations in India shall henceforth be governed as per modified guidelines enumerated below.

1. **Mining Plan:** All coal (including Lignite) mining operation in India shall henceforth be governed as per these modified guidelines listed below and henceforth, the Mine Closure Plan and Final Mine Closure Plan shall be integral part of Mining Plan. Separate approval of Mine Closure Plan/ Final Closure Plan has been done away with. The Guideline/format for formulation of Mining plan is enumerated at **Appendix – I.**

1.1. **Implementation of the approved Mining Plans shall be sole responsibility of the mine owner.** Mining operations shall be undertaken in accordance with the duly approved mining plan. The mining plan once approved shall be valid for the balance life of the Mine, provided that any modification(s) of the mining plan is approved by the competent authority and such approval of the modified mining plan shall remain valid for the estimate balance life of the mining plan. Modification of the approved mining plan during the operation of a mining lease also requires prior approval.

1.2. The mining plan shall cover prescription for different phases of life of the mine as stage plan. The Stage plan for 1st year, 3rd year, 5th year, year of achieving rated capacity of the mine, Final year (i.e. at the end of mine life) and post closure shall be submitted at the time of initial submission of mining plan. The project proponent shall submit a **report/information** consisting **a.** compliance status with respect to approval condition of mining plan and grounds specified at para 1.3A; **b.** stage plan for next five years; **c.** revised balance life of the mine; and **d.** revised calculation of ESCROW amount with respect to revised balance life, to Coal Controller, CCO, Kolkata with a copy of the same to Administrative Section dealing with the allocation/allotment of the block and section dealing with approval of mining plan at MoC/CCO, **for information**. Such report/information must be submitted at least 180(one hundred eighty) days before the expiry of 5 (five) year, starting from the commencement of the Mineral Concession (Amendment) Rules, 2020 or the date of execution of the duly executed mining lease deed, whichever is later. Information desired above must bear certificate of **Qualified Person/ Accredited Mining Plan preparing Agency** and have approval of the respective company board. Non submission of such information during the stipulated time may result in withdrawal of mine opening permission or cancellation of the approved mining plan, as may be decided by CCO.

The Mining Plan approved prior to issue of this Guideline will qualify for submission of such report/information at least 180(one hundred eighty) days prior to expiry of 5 (five) year from the date of notification of the Mineral Concession Amendment Rules 2020.

1.3.**(A)** The mining plan may be modified for **a.** for change in method of mining; **b.** for facilitating increase in sanctioned peak capacity that is in excess of one hundred and fifty per cent of the

sanctioned rated capacity; **c.** change in leased area; **d.** in the interest of safe and scientific mining; **e.** conservation of minerals; **f.** for the protection of environment; **g.** addition of reserve by way of proving of reserve in the existing lease area; **h.** for changes in final mine closure conditions; or **i.** and such other change that may be determined by the Central Government. While submission of revision/ modification of mining plan the reason for revision/ modification shall be specified in writing by the lessee.

(B) Notwithstanding anything contained in clause (A) above, for other minor changes, the project proponent is empowered to make modification with the approval of the respective company board. These minor changes shall cover **a.** changes in land type within the leased area; **b.** changes in HEMM deployment plan; and **c.** changes in location of infrastructure within the leased area. The project proponent shall submit specific report of such minor changes to Coal Controller, CCO, Kolkata with a copy of the same to Administrative Section dealing with the allocation/allotment of the block and section dealing with approval of mining plan at MoC/CCO, for information.

1.4. The Mining Plan submitted for approval shall have prior approval of the concerned Board of the Company.

1.5. The base date of the Mining Plan should be taken as cut-off date on which the extractable reserve, balance life etc. has been quantified.

1.6. The proposed leased area in the Mining Plan shall include the area specified in the mining lease within which mining operations can be undertaken and includes the non-mineralized area required and approved for the activities falling under the definition of mine as referred in The Mines Act 1952.Evacuation route, R&R and Employee Township area outside the block will not be part of the Mining plan.

1.7. Pre-mining land ownership/land type furnished in the mining plan will be of indicative in nature along with data source at its footnote (viz. from topo sheet, cadastral plan etc.).

1.8. The excavation/ mining area envisages in the mining plan must be restricted within the allotted/vested geological block boundary/existing mining lease and if the project area is confined within the allotted block boundary/existing mining lease, a certificate to this effect is to be provided by the **Qualified Person/ Accredited Mining Plan preparing Agency** preparing the mining plan. The certificate must be made on the Conceptual Plan depicting Cardinal Point Co-ordinates (shape co-ordinates) of the project boundary, Lease boundary and Geological Block boundary (binding co-ordinates given in the vesting order).

1.9. Under provisions of Rule 16 of MCR 1960, State Government is custodian of the exploration data. As such in the cases, where the project area extends beyond the block boundary/existing mining lease the Mines and Geology Department of the concerned State Government shall issue a certificate specifying (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/existing mining lease to rule out the issue of encroachment. The application for issue of certificate from the Mines and Geology Department of the State Government must be supported with proof of the non-existence of coal/lignite in the area under reference (along with their Cardinal Point coordinates) duly certified by custodian agency viz. CMPDIL/ SCCL in case of coal and NLCIL in case of lignite.

Where the project area extends beyond the block boundary/existing mining lease, the certificate issued by the Mines and Geology Department of the concerned State Government must be attached in the Mining Plan.

1.10. In case of allotted/auctioned coal/lignite blocks, the mining plan may be revised for extraction of more coal on year to year basis.

Provided that the mining plan shall be revised for extraction of less coal on year on year basis only under following circumstances: a. if the remaining extractable reserve of the coal mine is less than

3(three) times of the rated Capacity of the current Approved Mining Plan; b. Change in method of mining from Opencast to Underground necessitated due to change in geo-mining conditions. However, revision of Mining Plan for extraction of less coal would be subject to prior approval of the Nominated Authority.

1.11. The approval of the revised Mining Plan shall not result in changes in the terms and conditions or efficiency parameters mentioned in the CMDPA/Allotment Agreement signed at the time of allotment/vesting for the auctioned/allotted blocks without prior approval of the nominated authority or Central Government, as the case may be. However, efficiency parameters mentioned in the CMDPA/Allotment Agreement shall be linked to the rated capacity of the mine.

1.12. The project proponent shall envisage the action plan for exploration and liquidation of the balance reserve yet to be projectised.

1.13. The project proponent shall take all necessary precautions regarding safety of mine workings and persons deployed therein and shall adhere to all the statutory clearances with regards to safety.

1.14. Proposed project area envisaged in the mining plan shall not encroach into any other adjacent coal block unless permitted to do so by the Ministry of Coal in writing.

1.15. The approval of the Mining Plan is without prejudice to the requirement of approvals from competent /prescribed authority under the relevant rules/ regulations etc.

1.16. The project proponent shall submit an undertaking that the mine shall be operated as per the Environment Clearance (EC) & Forestry Clearance (FC) for the project.

1.17. **Statutory Obligation:** The legal obligations, if any, which the lessee is bound to implement, like special conditions imposed while execution of lease deed, approval of Mining Plan, conditions imposed by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Central Pollution Control Board (CPCB),State Pollution Control Board (SPCB), Directorate General of Mines Safety (DGMS) or any other organizations describing the nature of conditions and compliance positions thereof, should be indicated in the Mining Plan.

2. Mine closure Plans: Mine Closure Plans will have two components viz. i) Progressive or Concurrent Mine Closure Plan, and ii) Final Mine Closure Plan. Progressive Mine Closure Plan would include various land use activities to be done continuously and sequentially during the entire period of the mining operations, whereas the Final Mine Closure activities would start towards the end of mine life, and may continue even after the reserves are exhausted and/or mining is discontinued till the mining area is restored to an acceptable level. The Mine closure details of the Mining Plan should be oriented towards the restoration of land back to its original as far as practicable or further improved condition.

2.1. Mining is to be carried out in a phased manner along with reclamation and afforestation work in the mined-out area.

2.2. Progressive mine closure plan shall be prepared for a period of every five years from the beginning of the mining operations. These plans would be examined periodically in every five years period and to be subjected to third party monitoring by the agencies approved by the Central Government, like Central Mine Planning and Design Institute Ltd. (CMPDIL), National Environmental Engineering Research Institute (NEERI), Indian Institute of Technology (IIT-ISM) or any other institutes/ organizations/ agencies specified from time to time for the purpose.

2.3. Various project specific activities viz. mined-out land details & their technical and biological restoration plan, water quality management, infrastructure to be retained and demolished, disposal of mining machinery, etc. shall be furnished in the relevant paras. Where the backfilling of the mine void is being carried out as part of regular mining operation, it shall not be included in the list of progressive mine closure activities. However, in case, where the backfilling of mine void is to be carried out specifically for closure of the mine, quantum of such overburden and the mine closure fund earmarked for the purpose must be included in the list of activities to be taken up for mine closure in the mining plan at the time of submission itself.

2.4. The Government may at any time before the closure of mine require certain activities to be included in the mine closure plans, which it may consider necessary for the safety and conservation of environment, or in compliance with any modification/ amendment in the relevant legislation.

2.5. **Abandonment cost:** The total cost for carrying out such activities shall be estimated for assessment of abandonment cost of the mine involving progressive and final mine closure activities such as barbed wire fencing all around the working area, dismantling of structures/demolition and cleaning of sites, rehabilitation of mining machinery, plantation, physical/biological reclamation, landscaping, biological reclamation of left-out overburden dump, filling up of de-coaled void, post environmental monitoring, supervision charges, power cost, protective and rehabilitation measures including their maintenance and monitoring, miscellaneous charges etc. for the specified post closure period.

2.6. **Escrow Account Calculation:** In August 2009 it was estimated that typically closure cost for an opencast mine was around rupees six lakhs per hectare of the total project area and rupees one lakh per hectare for underground project area at the-then price level. Accordingly vide letter dated 7th January 2013 a guideline for mine closure was issued which needed modification in these rates based on the wholesale price index (WPI) as notified by Government of India from time to time while preparing the Mining plan and Mine Closure Plan. The escalated rate (based on the current base year i.e. 01.04.2019) is Rupees Nine Lakh per hectare in opencast and Rupees one lakh fifty thousand per hectare for underground Mine. These rates will be considered as Base Rate to be applicable from 01.04.2019, which may change as specified from time to time by the Government of India.

[Exemplary Calculation: {(Rs 6 lakhs x 1.561 linking factor for base year 2004-05 x WPI 121.1 as on April 2019) / (WPI as on August 2009)} = Rupees 8.75 lakh, rounded to Rupees 9 (nine) lakhs per hectare in case of Opencast project].

Henceforth, these rates will stand modified based on the wholesale price index (WPI) as notified by Government of India from time to time. Annual closure cost is to be computed considering the total project area of the mine multiplied by escalated rate (at the above mentioned rates) and dividing the same by the balance life of the mine in years. An amount equal to the annual cost is to be deposited each year throughout the mine life compounded @5% annually.

[For example if the annual cost works out to Rs 100, then in the first year the amount to be deposited will be Rs 100, in the second year 100x(1+5%)^1, in the third year 100x(1+5%)^2 and so on.]

Further, in case of the mine, where escrow account is already open, the annual closure cost is to be computed considering the total project area at the above mentioned rates minus the amount already deposited and dividing the same by the balance life of the mine in years and annual cost as arrived should be compounded @5% annually.

2.7. **Financial Assurance:** The Mining Company/ Mine Owner as a part of Financial Assurance will open a Fixed Deposit Escrow account, with the Coal Controller Organization (on behalf of the Central Government) as exclusive beneficiary prior to commencement of any activities on the land/project area of the mine and shall submit the same to Coal Controller Organization (CCO) before the permission is given for opening the mine. The mining company shall cause the payment to be deposited at the rate computed as indicated at Para 2.6. The owner of the company may select the Schedule Bank where the Escrow account is to be opened and inform the same to the Coal Controller, CCO, Kolkata.

2.8. Coal Controller, Kolkata shall get the WPI (used for escalation of closure cost at the time of formulation of Mining plan) updated, at the time of opening of Escrow account. The mine owner/ company including all public/ private sector companies shall deposit the yearly amount in a Schedule Bank in accordance with Para 2.6. Coal Controller, **Kolkata shall also get the**

information, submitted under to para 1.2, verified and get the yearly closure cost modified with respect to the latest WPI in accordance with para 2.6.

2.9. Final Mine Closure: The details of the Mining Plan (covering Final Mine Closure Plan envisaging the details of the updated cost estimates for various mine closure activities and the Escrow Account already set up, shall be submitted to the approving authority for approval at least five years before the intended final closure of the mine.

2.10. Final Mine Closure would be considered to be completed only after acceptance of the third-party audit report by the Coal Controller on the compliance of all provisions of Mine Closure Plan. Any Institute/ Organization/Agency as may be specified by the Government for this purpose may be engaged for Third Party audit to create a self-sustained ecosystem. Failure of restoration within the specified period may result in forfeiture of Escrow Account created as per Para 2.6& 2.7. The details of the Final Mine Closure Plan along with the details of the updated cost estimate for various mine closure activities and escrow account already set up shall be submitted at the time of approval of final mine closure plan.

2.11. **Time Scheduling for abandonment:** The Action plan for carrying out all abandonment operations (progressive and final mine closure) should be furnished in the form of bar chart for a period of life of the mine plus post closure period. Post closure period shall be taken as3 (three) years for Underground mines and Opencast mines having stripping ratio lesser than 6(six) MM^3/Te & 5 (five) years for mines having stripping ratio more than 6(six) MM^3/Te.

2.12. **Implementation of the approved Mine Closure Plan shall be sole responsibility of the mine owner.** Mining is to be carried out in a phased manner i.e. continuation of mining activities from one phase to other indicating the sequence of operations depending on the geo-mining conditions of the mine. Up to 50% of the total deposited amount including interest accrued in the ESCROW account may be released after every five years in line with the periodic examination of the Closure Plan as per Para 2.2. The amount released should be equal to expenditure incurred on the progressive mine closure in past five years or 50% whichever is less. The balance amount shall be released to mine owner/leaseholder at the end of the final Mine Closure on compliance of all provisions of Closure Plan. This compliance report should be duly signed by the lessee and certify that said closure of mine complied all statutory rules, regulations, orders made by the Central or State Government, statutory organisations, court etc. and certified by the Coal Controller.

2.13. **Responsibility of the mine owner:** It is the responsibility of the mine owner to ensure that the protective measures contained in the mine closure plan including reclamation and rehabilitation works have been carried out in accordance with the approved mine closure plan and final mine closure plan.

2.14. The owner shall submit to the Coal Controller a yearly report before 1st July of every year setting forth the extent of protective and rehabilitative works carried cut as envisaged in the approved mine closure plans (Progressive and Final Closure Plans).

2.15. The money to be provided per hectare of total Project Area for the purpose is to be deposited every year on commencement of any development activity on the land for the mine after opening a Fixed Deposit Escrow Account prior to obtaining mine opening permission from Coal Controller. Mining company/owners including all Public Sector Undertakings shall deposit the yearly amount in a Scheduled Bank. If the Mine owners fail to deposit the required annual amount in accordance with Para 2.6, 2.7 & 2.8, the Government can withdraw the mining permission.

2.16. The funds so generated are towards the security to cover the cost of closure in case the mine owner fails to complete the relevant closure activities. The prime responsibility of mine closure shall always lie with the mine owner, and in case these funds are found to be insufficient to cover the cost of final mine closure including the areas covered in Para 2.3 2.6, 2.7, 2.8 & 2.9 above. The mine owner shall undertake to provide the additional fund equivalent to the gap in

funding before five years of Mine Closure failing which it may be recovered by such other methods as the competent authority may deem fit in this regard.

2.17. **Final Closure Certificate:** The Mine owner shall be required to obtain a mine closure certificate from Coal Controller to the effect the protective, reclamation, and rehabilitation work in accordance with the approved Mining plan covering final mine closure provisions/activities have been carried out by the mine owner for surrendering the reclaimed land to the State Government.

2.18. The balance amount at the end of the final Mine Closure shall be released to mine owner on compliance of all provisions of Closure Plan duly signed by the mine owner to the effect that said closure of mine complied with all statutory rules, regulations, orders made by the Central or State Government, statutory organizations, court etc. and duly certified by the Coal Controller. This should also indicate the estimated extractable coal reserves and coal actually mined out.

2.19. If the Coal Controller has reasonable grounds for believing that the protective, reclamation and rehabilitation measures as envisaged in the approved mine closure plan in respect of which financial assurance was given has not been or will not be carried out in accordance with mine closure plan, either fully or partially, the Coal controller shall give the mine owner a written notice of his intention to issue the orders for forfeiting the sum assured at least thirty days prior to the date of the order to be issued after giving an opportunity to be heard.

3. Formulation of Mining Plan by Qualified Person (QP) or Accredited Mining Plan Preparing Agency (MPPA):

3.1. System of granting Recognition to a person for preparation of mining plan u/s 22C of MCR 1960 & preparation of mining plan only by RQP u/s 22B of MCR 1960 shall be done away with, after commencement of the Mineral Concessions (Amendment) Rules, 2020.

3.2. After commencement of Mineral Concession (Amendment) Rule 2020, no mining plan shall be accepted unless it is prepared by Qualified Person (QP) or Accredited Mining Plan Preparing Agency (MPPA).

3.3. Quality Council of India (QCI) or National Accreditation Board for Education and Training (NABET) shall be engaged for accrediting following entities:

(i) Accredited Prospecting Agency (APA) for undertaking prospecting operations and preparation of geological reports for Coal and Lignite Mines, and

(ii) Mining Plan Preparing Agency (MPPA) for preparation of mining plan (for Coal, Lignite Mines and Sand for Stowing)

3.4. The Quality Council of India (QCI) or National Accreditation Board for Education and Training (NABET)shall grant accreditation in accordance with such standards and procedures as specified in schedule VI of Mineral Concession (Amendment) Rule 2020.

3.5. Qualified Agency (QP) or Mining Plan Preparing Agency (MPPA) who prepares mining plan for a block/mine, shall have recognition from the concerned company board that the qualification of the QP or accreditation of the MPPA has been duly verified and is in line with the relevant provision of the MCR 1960.

4 Submission, Processing and Scrutiny of Mining Plan

4.1 **On and from the date of publication of order and upto the expiry of period of nine months from the commencement of the Mineral Concession (Amendment) Rules, 2020**, every mining plan submitted for approval/modification shall be accompanied with a non-refundable application fee specified from time to time in this regard, for the project area specified in the mining plan.

4.2 **On and from the expiry of period of nine months from the commencement of the Mineral Concession (Amendment) Rules, 2020**, every mining plan submitted for approval/modification

shall be accompanied with a non-refundable application fee specified from time to time in this regard, for the project area specified in the mining plan and peer/expert review done by any accredited mining plan preparing or reviewing agency at their (applicant's) own cost. During examination of the Mining Plan by the internal committee of MoC, if it is felt that a review by expert or by specialized agency is required, the committee may recommend referring the mining plan to such expert/agency with the approval of the MP approving authority. Charges for the expert review shall be borne by the applicant.

4.3 All pages (including cover page, plates and Annexures) shall bear the signature & stamp furnishing details of the QP/Accredited Mining Plan preparing Agency (MPPA) in physical mode of submission and e-signature/digital signature during the online system of submission.

4.4 Ministry of Coal is in process of development of on-line portal for submission and approval of mining plan. system of acceptance of Physical copy shall be continued till the development/operationalization of online portal for submission and approval of mining plan.

4.4.1 **Submission to Physical Copy Mining Plan to Ministry of Coal:**

4.4.1.1 The project proponent shall submit one soft copy and four hard copies of Mining Plan (draft)- one each to the concerned Administrative Section of the Ministry of Coal for the concerned block, Section of MoC/CCO dealing with approval of Mining plan, Coal Controller, CMPDIL/ Extended office of CCO & the dispatch receipt of the speed post (confirming that the draft Mining Plan has been sent).The contact details and correspondence address of the section dealing with the approval of Mining plan, administrative section for the mine, members of the committee etc. shall be updated time to time, on the website of the Ministry of Coal/Coal Controller Organisation.

4.4.1.2 The project proponent shall incorporate the observation (if any) and submit the mining plan (after incorporating the compliance to the observation) to section of MoC/CCO dealing with approval of Mining plan, concerned administrative section of the Ministry of Coal, Coal Controller and CMPDIL/ Extended office of CCO.

4.4.1.3 **Submission of Mining Plan (after incorporating compliance) to Ministry of Coal:** The project proponent shall submit 04 (Four) hard copies & 01 (one) soft copy of modified Mining Plan and the compliance to the observations along with copy of the dispatch receipt of the Speed Post (confirming that the modified Mining Plan has been sent to section of MoC/ CCO dealing with approval of Mining Plan, concerned administrative section of the Ministry of Coal, Coal Controller, and CMPDIL/ Extended office of CCO).

4.4.1.4 The procedure of submission at Para 4.3.1 will be replaced by process of submission at para 4.3.2 on development of portal for online submission and approval of Mining Plan.

4.4.2 **Online System of Submission of Mining Plan for Approval:**

4.4.2.1 Project proponent shall register online, using registered official mail ID.

4.4.2.2 For the purpose of preparation of Mining plan through a QP or MPPA, project proponent shall share a temporary login with QP/MPPA. This temporary login shall be valid till the preparation and approval of mining plan only.

4.4.2.3 The QP/MPPA shall upload the Mining plan through the temporary login and submit it to the project proponent; QP/MPPA once submits the mining plan to the project proponent, he shall not be able to modify.

4.4.2.4 The Project Proponent shall make payment of processing charges/fees online as specified from time to time by Ministry of Coal;

4.4.2.5 The Project Proponent shall after incorporating relevant company board approvals submit the mining plan to the Approving Authority; The mining plan submitted to approving authority shall become visible to Administrative Section for the respective block, section of MoC/CCO dealing

with approval of Mining plan, members of the Internal Committee, Coal Controller, CMPDIL/ Extended office of CCO, simultaneously. System of SMS alerts shall be available at all stages;

4.4.2.6 Observations of the Committee Members shall be uploaded online and the project proponent shall also submit Mining Plan, after incorporating compliance, online

5 Scrutiny & Processing of Mining Plan

5.1.1 The current system of getting the mining plan scrutinized through CMPDI, Ranchi shall continue. Ministry of Coal is in process of creating an extended office of Coal Controller Organization at Delhi which shall be delegated with the work of processing and scrutiny of mining Plan. A letter to this effect shall be issued separately.

5.1.2 CMPDIL/Extended office of CCO at Delhi shall scrutinize the mining plan and submit comments to section of MoC/CCO dealing with approval of Mining plan within Fifteen (15) days of receipt of the Mining Plan. Non-submission of comments within the stipulated time may be presumed as "no comment" from CMPDIL/Extended office of CCO; CMPDIL/ Extended office of CCO at Delhi, if consider necessary to make a physical verification of the site/site visit for scrutiny of the mining plan, may make such site visit/physical verification of the site, however, no relaxation in the time line as specified above may be given.

5.1.3 Administrative Section of the Ministry of Coal (dealing with the block) shall scrutinize the mining plan with respect to Vesting order/ allotment order and CMDPA signed with allottee at the time of allotment and submit observations to section of MoC/CCO dealing with approval of Mining plan (till the development of portal for Mining plan approval) within Fifteen (15) days of receipt of the Mining Plan. Non-submission of comments within the stipulated time may be presumed as "no comment" from the administrative section;

5.1.4 Members of the Internal Committee shall examine the mining plan from Technical and administrative angle based on the observations of the Administrative Section (dealing with the respective block) and CMPDIL/Extended office of CCO and the peer/expert review report submitted with the mining plan and submit observations to section of MoC/CCO dealing with approval of Mining plan (till the development of portal for Mining plan approval) within Fifteen (15) days of receipt of the Mining Plan. Non-submission of comments within the stipulated time may be presumed as "no comment" from the administrative section. Members of the internal committee, CMPDIL/Extended office of CCO may raise observation twice only. The observation raised shall be communicated directly to the project proponent for incorporating the same in the mining plan. The project proponent shall make presentation in the meeting of the internal committee for scrutiny.

5.1.5 Section of MoC/CCO dealing with approval of Mining plan shall communicate the observation (if any) to the project proponent for compliance till the development of online system for submission, processing, and approval of mining plan.

5.1.6 Subsequent, to development of online portal for submission, processing, and approval the observations of the internal committee members shall be uploaded directly on the portal, which will be visible to the project proponent. A timeline of 15 days shall be available for the internal committee members to upload the comments. Non-submission of comments within the stipulated time may be presumed as "no comment".

6 Timeline for submission of Compliance:

Once the observation of the Scrutiny of the mining plan is communicated either in hard copy, mail or online, the Project Proponent is required to submit the mining plan after incorporating the compliance to the observation within a period of 15 days of the communication, failing which the mining plan submitted for approval shall be rejected.

Provided that any such application may be entertained after the said period of 15 Days, if the applicant satisfies the approving authority that he had sufficient cause for non-submission of mining plan (after incorporating the compliance) in time. However, in any case this period may not be extended beyond 30 days from the date of receipt of communication of the observation.

7 Approving Authority:

7.1 On and from the date of publication of order and up to the expiry of period of nine months from the commencement of the Mineral Concession (Amendment) Rules, 2020, the powers to approve mining plan for all categories of coal and lignite mines and sand for stowing shall be exercisable by Project Adviser, Ministry of Coal.

7.2 On and from the expiry of period of nine months from the commencement of the Mineral Concession (Amendment) Rules, 2020, the power to approve mining plan for all categories of coal and lignite mines including sand for stowing shall be exercisable by the Coal Controller, CCO, Kolkata, a subordinate office of Government of India in the Ministry of Coal.

7.3 The person delegated to approval of Mining Plan under sub-section (1) of section 26 read with clause (b) of sub-section (2) of section 5 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) (hereinafter, the 'Act') may seek help of an Internal committee constituted for the purpose.

7.4 The approving authority shall dispose of the application for approval of the Mining Plans within a period of 30 days from the date of receiving of such application (The Mining Plan received on or before 30th of Current Month will be considered in the ensuing meeting). Provided that the aforesaid period of 30 days shall be applicable only if the Mining Plan is complete in all respect, and in case of any modifications subsequently suggested after the initial submission of the Mining Plan for approval, the said period shall be applicable from the date on which modified mining plan is re-submitted.

8 Internal Committee for Scrutiny of Mining Plan:

8.1 Members of the Internal Committee shall examine the mining plan from Technical and administrative angle based on the observations of the Administrative Section dealing with the respective block & CMPDIL/ Extended office of CCO.

8.2 The internal committee shall recommend the mining plan for "Approval" or "Rejection". In case of recommendation for Rejection, the committee shall record the reason for Rejection.

8.3 Till the opening of CCO office at Delhi, the internal committee shall consist of:

1. Director (Technical), MoC, Member Secretary
2. Director/ Deputy Secretary, MoC of the section dealing with the allocation/allotment of the respective block, Member
3. Coal Controller or his representative, Member
4. Director level officer of CMPDIL, Member
5. Director/Deputy Secretary, Nominated Authority, Member

8.4 After opening of CCO office at Delhi, the internal committee shall consist of:

1. Director level officer of CCO having relevant working experience., Member
2. Director/ Deputy Secretary of the section dealing with the respective block, Member
3. Head of Regional Coal Controller Office (having relevant working experience in mine planning), CCO Regional Office New Delhi, Member Secretary
4. Any other technical person having working experience of not less than 15 (fifteen) years in mine planning, Member

9 Communication of Approval:

9.1 In case of allotted/auctioned mine, section dealing with approval of Mining Plan shall communicate the decision of the approving authority within a period of 5 (five) working days in form of a letter confirming "in-principle approval" of the Mining Plan to the project proponent

with a copy of the same to the Nominated Authority, Govt. of India. Final approval of the Mining Plan in such cases shall be communicated by the section dealing with approval of Mining Plan, only on receipt of applicable payments and its confirmation from the Nominated Authority, Govt. of India.

9.2 While for mines other than auctioned/allotted mines, section dealing with approval of Mining Plan shall communicate the decision of the approving authority within a period of 5 working days.

10 Revision:

10.1 Any person aggrieved by any order made or direction issued in respect of mining plan by an officer competent to approval mining plans shall within 30 days of the communication of such order or direction, apply to the Secretary (Coal), Ministry of Coal for a revision of such order or direction thereon.

10.2 On receipt of any application for revision the authority shall give the aggrieved person a reasonable opportunity of being heard and may within 30 days confirm, modify or set aside the order or direction and his decision thereon shall be final.

11 **This Guideline** supersedes the previous orders and are without any prejudice to any other relevant rules and regulations, such as those issued by the State Governments, Ministry of Environment, Forest and Climate Change, Ministry of Labour and Employment, etc.

(Hitlar Singh)
Under Secretary to the Government of India

To,

All the existing Coal and Lignite block allocates

Copy to: -

1. All Joint Secretaries, MoC.
2. Coal Controller, Coal Controller's Office, 1- Council House Street, Kolkata.
3. CMD, CIL, Newtown, Rajarhat, Kolkata-700156, W.B
4. CMD, NLCIL, Cuddlore, Distt. Neyveli- 607801 (Tamil Nadu).
5. CMD, Singareni Collieries Company Limited (SCCL), Kothagudem Collieries, Khammam Distt.(A.P).
6. Tech. Director (NIC) - with the request to place it to Website of the Ministry of Coal.

Additional Annexure-10

Annexure- X

Ref:- EMMRL/Bandha/CMPDI/MP/01-2021 Date: 9th Sep 2021

General Manager
Business Development, CMPDI
Gondwana Place, Kanke Road
Ranchi - 834031

Sub : Mining Plan (Including Mine Closure Plan) for Bandha Coal Block

Dear Sir

We are in receipt of Draft Mining Plan of Bandha OCP (5.0 MTPA) vide ref no. CMPDI/BD/C(999)/E-373650/29 dt. 26.08.2021. At the outset, we extend our thanks as the plan has been done very well and your team deserves our heartiest compliments on doing such a fine job. We have however, a few issues which we would request you to kindly examine. The said plan is required to be submitted to the Government for approval and whatever we are submitting in our attached comments/observation may kindly be examined by you and those that you find as valid may be incorporated in the Mining Plan. Our observation/comments are attached herewith for needful action.

Thanking You,
For EMIL Mines And Mineral Resources Ltd

(Satya Prakash)
Head – Commercial Coal

Encl.: As above

EMIL Mines And Mineral Resources Ltd
Regd. Office: Industry House, 18th Floor, 10 Camac Street, Kolkata 700017, India
CIN:U14290WB2020PLC236717|T: +91 33 4455 5500| F : +91 33 4455 5537
E: emmrl.registered@adityabirla.com

Annexure- X

MINING PLAN OF BANDHA

Sl No	Clause No	Item	Observation / Suggestion
1	-	Cover Page	Mining Plan (Including Mine Closure Plan)
2	-	Cover Page	EMIL Mines And Mineral Resources Limited (EMMRL)
3	-	Rated and Peak capacity- Cover Page	a. Rated Capacity: 5MTPA b. Peak Capacity (@150% of the rated capacity): 7.5MTPA Note: 1. Circular issued by MoC for peak capacity to be annexed. 2. Calendar programme of excavation to be included with a peak capacity of 7.5MTPA
4	-	List of Plates	R.F should be mentioned
5	-	Abbreviations	Abbreviations should be added after Plates before Checklist
6	-	List of tables	List of tables to be added
7	1.1.3	Base Date of Mining Plan/Mine Closure Plan	September 2021
8	1.1.6	Mode of Coal Transport	Railway and road based on consumer location
9	1.2.3	Availability of power supply, water etc	Madhya Pradesh State Electricity Board (MPSEB)
10	1.2.4	Prominent physiographic features drainage pattern, natural water courses, rain fall data, highest flood level	Kachanmuda Nala originates from the block and runs south to north inside the adjoining Amelia Block and meets Kachan dam in the north east of the block. **Rest as per Draft Mining Plan clause 1.2.4**
11	1.2.5	Important surface feature within the project area and major diversion or shifting involved	a. Name of the Villages to be modified as Bandha, Tenduha, Pidarwah, Pachaur and Deori b. Railway line need not to be diverted – has to be mentioned c. Following sub-headings also should come for diversion: - i. Road ii. 11 KV line

Prepared By Atal Bihari On 30/10/2021

12	1.3.1	Name of the Allotee	Need to be changed everywhere: EMIL Mines And Mineral Resources Limited.
13	1.3.3	Name and address of the applicant	Phone, Fax ,e-mail and Website should be captured
14	1.3.5	Starting Date of the Mine as per CMDPA	Not CMDPA it is CBDPA. Starting date of the mine as per attached production plan
15	1.3.7	Production schedule as per opening permission	Production schedule of the mine as per attached production plan
16	1.3.9	Cardinal points coordinates of the block boundary	Certificate from CMPDI to be annexed
17	1.5.2	Block area projectised	It should be checked whether it should be 1315 or 1350
18	1.5.5	Life of the Project "Yrs"	As per the table provided in general comments section (Sl. No. 6)
19	1.5.10	Seams not considered for Mining with reasons	Please add Underground concept note as annexure
20	2.1.8		Project area is confined within area, certified map from Qualified person is attached as Annexure ….
21	2.2.1	Regional geological setup of the area, local geology, Structure, Stratigraphy sequence	Missing – it should be given as per GR. Regional Geology set up has not been provided.
22	2.2.8	Whether any further exploration / study is required or suggested and time frame in which it is to be completed	14000 to 16000 meter of drilling is proposed in indicated reserve area.

23	2.2.9	Year wise future programme of exploration	Future exploration to be completed within 2 years of commencement of Mining operation.
24	3.1.2	Proposed method of mining with justification on suitability of method of mining	Following Head wise should be elaborated: - i. Mine Boundaries ii. Opening Location iii. Mine Design: - a. Rated Capacity b. Design Criteria iv. Mining Scheme v. Coal Wining & OB removal vi. Drilling & blasting vii. Bench Height viii. Bench width ix. Slope x. Sequence of Mining xi. Overburden Removal & OB dumps xii. Top Soil Management xiii. Selected methodology
25	3.1.7	Tentative Coal Production Plan “MT	There is a discrepancy in OB volume data at one table it is shown as 1922 MCM instead of 1917.50 MCM. Year-wise cumulative coal, OB and SR should be added.
26	3.1.12	Results of any investigation carried out for scientific mining, conservation of minerals and protection of environment; future proposals	Additional Studies: - Please mention following studies to be carried out in future. 1. In Pit conveying system 2. Geo-technical study. 3. Use of Technology for Environment, sustainability & Governance in Mining operation Note: Slope stability study is not required to be mentioned here as this is a mandatory study to be carried out by project proponent
27	4.1	Important safety aspects	Missing: - A commitment from the Company Board is annexed Note: To be provided by EMMRL
28	5.2	Power supply & illumination	Bandha OCP proposed to receive power at 33 kV from nearby 132/33 kv sub station. 2 Nos. 33 kV overhead circuits separately on tower line through AAA conductor (panther equivalent). At 5 Mtpa stage, 2 Nos. 7.5 MVA, 33/6.6kV (each) has been proposed for power supply arrangement of Bandha OCP for OB, Coal

			including CHP & office power supply etc. To meet the maximum demand for additional loads coming under the coming years associated switchgears may be provided in coming years of quarry operation. The maximum demand will be achieved after considering 80% diversity and improving the system power factor to 0.98 by providing capacitor banks of adequate capacity.
29	5.3	Drainage & Pumping: Assessment of volume of water for Pumping, Pumping Capacity	Please elaborate calculations of pumping requirement and capacity of pumps
30	5.4	Coal Handling Arrangement: Brief detail of CHP/ Mode of Dispatch, Coal quality and coal staking and handling arrangement	Please change capacity of followings; 1. Storage bunker- 12000 with 2 partitions of 8000 T & 4000 T 2. Surge Hopper Capacity should be such that it can load a full rake (4000 T) 3. All equipment to be provided as per peak capacity of 7.5 MPTA
31	6.1.3	Surface features over the block area	a. Village names should be modified as per modifications made at clause 1.2.5 b. Kachanmuda nala should be modified as per modifications done at clause 1.2.4
32	6.1.4, 6.1.5, 6.1.6	No. of villages/ Houses to be shifted Population to be affected by the project] Proposed Rehabilitation programme	Details to be captured as per already completed SIA Study to be provided by EMMRL
33	6.2	Details of lease – Missing as	It must cover all sub-headings as per MoC guidelines of Mining Plan format captured in Page no 27 & 28

		per MoC notification	
34	7.1	Commitment from the project proponent that the company will comply Environment and Forest Condition stipulated in the respective clearances	Last line of 7.1 should read as "Environmental Clearance and Forest Clearance is annexed". (To be provided by EMMRL)
35		Chapter 8	Following Heads need Elaboration: - 1. Year wise Dump schedule with dump locations to be provided. 2. Water Quality Management- Could not understand what was intended to write here. The write up should be on Water Quality Management post mine closure. a. Waste water generation and control of pollution b. Waste water from service facilities c. Waste from HEMM washing and Workshops d. Pumped out water from the quarry e. Surface run-off from External dump 3. Water Demand & Water Balance 4. Source of water 5. Air and Dust Pollution Control Measures a. Controlling fugitive dust b. Drilling operation in OB c. Blasting in O.B d. Loading of O.B. and coal to Dumpers e. Transport of OB and Coal 6. Control of Dust in CHP 7. Measures to mitigate CO levels 8. Measures to mitigate NOx levels 9. Noise Control Measures 10. Year wise top soil management 11. Restoration of Land used for Infrastructure 12. Disposal of Mining Machinery 13. Safety & Security 14. Safety Management Plan 15. Mechanized opencast working
36	8.10.1	Abandonment Cost:	Guideline for this table is available in the notifications issued by MoC and detailed in table 8.10.1 page no 39. Format may please be followed.
37		General	1. As per provided Mining plates an external dump D1 is required to be re-handled during the mining operation itself. It has not been elaborated in Calendar Programme. 2. Table 6.1.2 & 8.1.2 – Tables show 1575 and 1555 ha of plantation respectively. Further all the biologically reclaimed area has been proposed for plantation. In our view plantation area should be restricted to the extent of

forest degradation only. Rest we should propose to reclaim as agricultural land.

3. A stage plan to be provided showing coal evacuation arrangement after re-aligning mining face to East - West.
4. MDO / Contractual operation may be added
5. Considering the simplicity of the structure, it is requested that a total Geological and Mining Loss should be taken as 5% instead of 15% considered in the MP.
6. Construction period as per the table below:

Year		Year of Production				
Calendar Year	Year of Operation	UG	OC	Total	OB	Strippping Ratio
2021-22	PC1					
2022-23	PC2					
2023-24	PC3					
2024-25	PC4					
2025-26	PC5					
2026-27	PC6 & C1				5.00	-
2027-28	Y1				15.00	
2028-29	Y2		0.50	0.50	18.20	36.40

7. Equipment for OB removal to be calculated as per MDO Norms adopted by CMPDI.
8. Provision for haul road. It should be taken as 25mtrs instead of 40mtrs as coal evacuation will largely be through in-pit/surface conveyor
9. Please examine possibility of application of high-wall mining where open cast operation stops and reserves to be added.
10. Punch entry for underground mining - For approaching the Punch Entries, substantial decoaled space by the side of the Northern Boundary has been left unfilled. In the process substantial over burden storage capacity has got lost. We suggest construction of Reverse inclines for approaching the seams and these Inclines could be located further to the west to the point where open cast mining will be stopped.

11. Provision of Shaft - The Shaft has been located in the South–East corner of the block. Here also, substantial over burden dumping space gets lost. Further, the Shaft will come into use only towards the fag end of life of underground mine. Instead, consideration may kindly be given to location of the shaft near the Reveres inclines. This will obviate loss of over burden dumping space and the shaft coming to use right from the start of underground mining.
12. Equipment configuration may be verified such as addition of 2 no's of drills as mentioned as coal equipment (Coal wining through SM)
13. Table to be given

    Seam Thickness Range, Depth Range (m),Net Geo. Res. (Mt), Blocked Reserve (Mt) - Highwall/ Batter , Nala/River/Road, Barrier Uneconomical, Total Blocked; Mineable Reserves, Mining Losses

Annexure- X

Prepared By Atal Bihari On 30/10/2021

Additional Annexure-11

Annexure- XI

NOTE ON HYDROLOGY OF BANDHA COAL BLOCK FOR MINE PLANER

STATEMENT OF PROBLEM AND SOLUTION:

As suggested in ToR by MoEF, there will not be any diversion of Kanchanmuda & Bandha Nala outside mine boundary. Mine is planned in such a way that the total surface water available in pre mining should be same during mining and post mining period. In pre mining the present nala is seasonal which will become perennial with addition mine seepage water during mining period: In this regard detail Hydrological Study of Bandha Coal Block is being done. Some of the salient features of study are given below:

1. WATERSHED:

Bandha Coal Block is located at ridge of two micro watersheds.

I. Bandha Nala Micro-watershed (79.19 km^2)

II. Kanchanmuda Nala Microwatershed (40.85 km^2)

These two micro watersheds are part of two different sub watersheds of Sone River sub zone (1 d)

1. Bandha Nala ⟶ Mahan Nadi ⟶ Gopad River ⟶ Sone River
2. Kanchanmuda Nala ⟶ Kanchan Nadi ⟶ Rihand Dam ⟶ Sone River

I. In Coal Block, Bandha Nala constitutes only 14.5 km^2 of Bandha Nala micro watershed. The external water of 5.15 km^2 is entering into coal block.

II. In Coal Block, Kanchanmuda Nala constitutes only 4 km^2 of total Kanchanmuda micro watershed. No external water is entering into coal block from Kanchanmuda nala.

2. PEAK FLOOD ESTIMATION:

Peak flood estimation is done based on area of 5.15 km^2 as external water entering into mine from Bandha Nala Watershed. This is required to suggest suitable design of catch / garland drain for safe mining. The Rational Method is used for estimation of peak flood. The peak flood for external water is estimated based on heaviest rainfall in 24 hour in 1 year (2021), 25 years, 50 years and 100 year return periods. The estimated peak flood of different periods is given in **Table 1.**

Table 1: Peak Flood Estimation

Sr. No.	Heaviest Rainfall in Past years return period	Rainfall in 24 hours	Rainfall Intensity	Runoff Coefficient 25%	Area of External Water	$Q = \frac{CIA}{3600}$
			I	C	A	
		mm	m/hr		$m^2 \times 10^6$	m^3/sec
1	1 (measured)	40	0.015	0.25	5.15	5.36
2	25 (Isopluvial)	180	0.066	0.25	5.15	23.60
3	50 (Isopluvial)	200	0.074	0.25	5.15	26.46
4	100 (Isopluvial)	240	0.088	0.25	5.15	31.47
5	Recommended peak flood – double of 100 years return period					63

The design of garland / catch drain is done based on recommended peak flood for safety of mine. The tentative design will be Bed width – 4 m, side slope – 1.5:1, Depth of water 3 m, slope gradient – 1: 100.

3. ANNUAL MONSOON RUNOFF YIELD:

The annual runoff yield generated and pass through Bandha Coal Block is estimated and given in **Table 2.**

Table 2: Annual Monsoon Runoff Yield

Sr. No.	Catchment	Area km^2	Monsoon Rainfall	Runoff Coefficient Monsoon Rainfall	Total Annual Yield
		$m^2 \times 10^6$	m	%	$m^3 \times 10^6$
1	Bandha Coal Block	18.50	1.0066	20	3.72442
2	Kanchanmuda Nala Coal Block	4	1.0066	20	0.80528
3	Bandha Nala Coal Block	14.5	1.0066	20	2.91914
4	Bandha Nala External	5.15	1.0066	20	1.03679
5	Total Kanchanmuda Nala Watershed	40.85	1.0066	20	8.22392
6	Total Bandha Nala Watershed	79.19	1.0066	20	15.94253

Surface water within coal block will yield 3.72 MCM/year with addition of 1.037 MCM/year will be external water pass through coal block. Thus, the total water passing through coal mine will be 4.76 MCM/y. Out of this 0.80 MCM/y through Kanchanmuda Nala and 3.96 MCM/y will be through Bandha Nala. Total water of 4.76 MCM/y will be conserved and will be discharge into respective nalas without diverting nala outside mine boundary. The tentative method for water management will be dealt here with.

4. WATER MANAGEMENT PLAN:

The entire external water passing through Bandha Nalla will be taken in to lease area for water conservation and a proper water management is being planned so that there should not be any unnatural loss of surface water runoff. The water management plan of mine will provide water in Bandha and kanchanmuda nala throughout year by surface water and mine seepages.

Garland drains have been planned on along periphery of quarry, external dump, backfilled areas (depending on contours). The garland drains shall be routed through catch pits and settling tanks to settle out suspended solids in the storm water. The clean water will be discharged to natural water courses. Small grasses and bushes in drains hold back solid particles from draining away. Small stone barriers across the drain will check water current and arrest solids.

Stone pitching will be made at suitable places to regulate water flow. Some of the drains which will serve for a long time shall be made pucca. Settling pits, garland drains shall be cleaned regularly, especially during monsoons.

- The proposed Garland Drains will not affect the Basin and sub basin flows, as the discharge received at end point of channel is the flood discharge of the same catchment area. Thus the Garland Drains will not change in catchment area of Kachanmuda Nala.
- A network of Garland drains to be provided to intercept the surface run-off from undisturbed area so that they do not flow into “disturbed area” & get polluted. This will arrest surface run off from all the three sides.
- A network of Garland drains to be provided to intercept the surface run-off from “disturbed area” and direct it to sedimentation pond to treat it. Treated water will be

allowed to flow into natural drains. Under the proposed drainage network following drains are proposed

- **Catch Drain**: - Open drain around the quarry on eastern, Southern, Northern & western side to intercept the surface run-off and prevent them to enter quarry. Intercepted water will be diverted to natural drain
- **Foot Drain: -** Garland drain around the external dump to collect surface run-off from the dump and direct them to sedimentation pond. Treated water from sedimentation pond will be allowed to follow to natural drains
- For additional safety the Garlands channel have been designed for more discharge capacity to accommodate additional flood discharge along with high channel bunds on both side.
- The scheme involves very simple civil engineering works and can be completed in a period of 2-3 years.
- Naturally occurring construction materials like sand, screened gravel and aggregates etc. are available in the nearby area. Construction of the proposed Garland channel is safe for environment and habitation in the nearby area.

Thus the re-coursing of Kachanmuda Nala will have no impact on hydrological pattern of the area, at the operational stage of mine entire surface run off from lease hold area will flow through respective schemes.

5. APPROVAL FROM COMPETENT AUTHORITY:

Based on Hydrology report proper design and drawings of proposed Garland / catch Drains will be evaluated by Water Resources Department, M.P. Based on their approval, construction will be done accordingly.

6. AQUATIC ECOLOGY:

- No endangered, threatened and endemic category fauna as per the IUCN-Red Data Book (RDB), Botanical Survey of India (BSI), Indian wildlife (Protection) Act, 1972 reported in the water body.
- Natural re-colonization of aquatic species is likely to take place, once flow of energy and nutrients will restore in the Garland channel.
- The proposed Garland Drain scheme has minimal interference
- with the environment and hence would not affect the aquatic ecology of the study area

Additional Annexure-12

Annexure-XII

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इंस्टीच्यूट लिमिटेड
(कोल इण्डिया की अनुषंगी कम्पनी/भारत सरकार का उपक्रम)
गोंडवाना प्लेस, कॉके रोड, राँची-834031, झारखण्ड(भारत)
Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited/Govt. of India Public Sector Undertaking)
Gondwana Place, Kanke Road, Ranchi -834031, Jharkhand (India)
CIN:U14292JH1975: Website-www.cmpdi.co.in An ISO 9001-2015 Certified Company (License No. QM/L-5003433)
क्षेत्रीय संस्थान-6, पत्रालय-जयंत, जिला-सिंगरौली (म.प्र.) भारत- 486890
Regional Institute-VI, PO-Jayant, Dist- Singrauli (MP) – 486890
फोन नं.:07805-277812, फैक्स नं.:07805-277807, ई-मेल: rdri6.cmpdi@coalindia.in

क्रमांक: सीएमपीडीआइ/क्षे.सं.-6/खान योजना/2021/ दिनाँक: 14.09.2021

Minutes of Meeting held on 13.09.2021 at CMPDI, RI-VI and CMPDI (HQ), Ranchi through VC

A meeting was held on 13.09.2021 at CMPDI, RI-VI and CMPDI (HQ), Ranchi through VC on draft Mining Plan & Mine Closure Plan of Bandha OCP headed by Shri A. K. Rana, Director (T/P&D), CMPDI (HQ), Ranchi. The draft Mining Plan & Mine Closure Plan of Bandha OCP has been presented by CMPDI, RI-VI in presence of RD, RI-VI. The comments from EMMRL has been received on 09.09.2021. The following decision has been taken on Bandha OCP and received comments from EMMRL:

Sl.No.	Comments of EMMRL	Decision taken in meeting
1	Total geological and mining loss should be taken as 5% only	This is as per ISP guideline 10% uncertainity loss should be taken for NGR & 5% mining loss as per CMPDI Norms
2	MDO/Contractual Operation may be added	As per scope of work in work order, PR should be prepared in departmental mode.
3	All equipment to be provided as per peak capacity of 7.5 Mtpa.	As per scope of work in work order, mining plan and PR should be prepared for rated capapcity
4	HEMM should be calculated as per MDO norms	May be considered as per suitability of EMMRL.
5	OB Removal should start in pre-construction and construction period.	May be considered as per suitability of EMMRL only in construction period.
6	Application of Highwall Mining and reserves should be added corres-pondingly	As per geo-mining condition and proposed design of opencast project, there is little scope of Highwall Mining
7	Construction of Reverse Incline in UG for approaching the seam should be in dip side (west side of the block) in place of Punch entry.	As per UMD Division, the proposed Punch Entry is most suitable.
8	Location of Shaft-2 in south-east corner, should be changed and may provide near to Rreserve Incline.	As per UMD Division, the proposed location is most suitable.
9	Cardinal points co-ordinates of the block boundary - Certificate should provide from CMPDI	Exploration Deptt. of CMPDI (HQ) may fulfill the requirement.

List of Participants

CMPDI (HQ)
1. Shri A K Rana, Director (T/P&D)
2. Shri Manvendra Kumar, GM(PAD)
3. Shri D Bhattacharjee, GM(OC)
4. Shri Pramod Kumar, CM(Mining)

CMPDI, RI-VI
1. Shri Atal Bihari, RD, RI-VI
2. Shri R K Meena, HOD (MP)
3. Shri Satyaveer Singh, Manager(Mining)
4. Shri Saumya Dutta, Dy.Manager(Geology)

Atal Bihari
14.9.21
क्षेत्रीय निदेशक

फोन नम्बर/Phone No. : 07805-277812
फैक्स नम्बर/Fax No. : 07805-277807
E-mail: : rdri6.cmpdi@coalindia.in
वेबसाईट/Website : www.cmpdi.co.in

Prepared By Atal Bihari On 30/10/2021

Additional Annexure-13

Annexure-XIII

General Safety Precautions

All 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.

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.

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:

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. 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.

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.

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.

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:

viii) In the event of encountering steep floor gradient, floor blasting should be done and the area properly levelled by dozer before spoil dumping.

ix) No working or construction should be allowed within the 60m toe of the OB dump.

x) 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 .

xi) 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.

xii) 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.

xiii)Formation of dumping should be done in square or circular or any regular shape as far as possible.

xiv) 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 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 (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.

4. **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**

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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.

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 (Organization 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 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.

9 . **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.

10 . **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.

Additional Annexure-14

Annexure-**XIV**

CONCEPTUAL NOTE

FOR

ASSESSMENT OF UG MINING POTENTIALITY

OF SEAMS IN LEFT OUT AREA & UNDERLYING VIRGIN SEAMS OF BANDHA COAL BLOCK

SEPTEMBER 2021

UNDERGROUND MINING DIVISIN

CENTRAL MINE PLANNING & DESIGN INSTITUTE (CMPDI)

(A Subsidiary of Coal India Limited)

GONDWANA PLACE, KANKE ROAD, RANCHI

JHARKHAND, PIN – 834031

Prepared By Atal Bihari On 30/10/2021

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Annexure-**XIV**

1 INTRODUCTION

Mining Plan and Mine Closure Plan of Bandha Coal Block of M/s EMIL Mines & Mineral Resources Limited (EMMRL) is under preparation at RI-VI, CMPDI, Singrauli. The said Coal Block shows the existence of seven coal horizons with their splits (i.e. from seam-II to Seam-VIII with their splits). Coal extraction by opencast has been proposed up to seam-VII in part of the area. Underground mining potentiality of left out coal seam-VIII & VII in dip side of the block along with other underlying seams of seam-VII has to be assessed.

1.1 LOCATION

The block area under study for report falls in the Deosar Tehsil of Singrauli district of Madhya Pradesh State. The block is located on the North-Eastern part of Main basin of Singrauli Coalfield. The block area is bounded by Latitude 24º 6' 51.064"N to 24º 4' 17.375"N and Longitude 82º 24' 56.668"*E to 82º 21' 39.764"E*.

2 DESCRIPTION OF THE BLOCK

The block extends over an area of about 18.50 Sq.km, in which forest cover is extended over an area of about 7.90 Sq.km. The block is covered by Mohanban Reserve Forest and Pidarwah Protected Forest in many patches. The limits of Block Boundary are defined as given below:

Northern : Southern boundary of Coal conveyor corridor for Amelia block which is 25 meters away from the southern boundary of Bandha North block.

Eastern : Western boundary of Amelia block.

Southern : Part of northern boundary of Chhatrasal block and part unblocked.

Western : Unblocked Area

2.1 GEOLOGICAL STRUCTURE

The general dip and strike of the seams within the geological coal block area as under:

i) Strike	The strike of the coal seam is generally NE-SW in the block.
ii) Dip	Dip of the bed varies from 2^{o} to 8^{o} NW in most part of the block.

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2.2 EXPLORATION STATUS

The block is geologically explored. Total 164 number of boreholes have been drilled within the block. The estimated borehole density comes around 9.0. The said borehole density is for seam-VIII & Seam-VII but for other underlying seams, the borehole density are lower than 9.0 and comes up to 0.7 in seam-II.

2.3 ADDITIONAL EXPLORATION REQUIREMENT

The geo-mining parameters of the block are very much suitable for introduction of mass production technology like longwall and Bord & Pillar with continuous miner. Proposed opencast in Bandha Block envisages external and internal dumping over major part of the block area (i.e. around 16.5 sq.km) having dump height 120m from original floor level. This will increase the effective depth of seam in left out area as well as in de-coaled area which are to be worked by underground mining method. Considering dead load of 120m height dump and depth of seam, Bord & Pillar system of mining (Especially in dip side of the property) may be difficult. The borehole density of the block for upper seams (i.e. seam-VIII & VII) is around 9.0 but for lower seams is around 6 to 7, which is less for introduction of mass production technology as long wall. Deployment of long wall technology will require high capital investment. Hence some additional borehole will be required to make higher borehole density in lower seams for successful deployment of long wall technology. Tentatively estimated number of borehole may be as under:

Number of Boreholes	Mean average Depth	Total Meter
50 (approx.)	350	17500 m (approx.)

The said borehole should be drilled before start of opencast mining operation within the block otherwise it will be difficult to drill hole in de-coaled, internally & externally dumped area in future. Underground mining with mass production technology as long wall in less borehole density area may be difficult.

3 MINING HISTORY OF THE BLOCK

The block is presently free from any mining activity but seam-VIII & VII have been considered for opencast planning for this project. The nearest mining activity is in Amelia North block (first in Main basin) situated north east of this block by a joint venture of Jay Pee industries & M.P. Govt.

4 DETAILS OF SEAM & SELECTION / REJECTION OF SEAMS FOR UG MINING

The geological block considered for this report shows existence of seven coal horizons along with their splits from seam-VIII to seam-II.

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Annexure-**XIV**

4.1 SEQUENCE OF SEAMS

The sequences of seams, their thickness range, depth range and parting between seams within the considered geological block are as under:

Coal Seam /Parting	Stratigraphic Thickness Range (m)			Effective Thickness Range (m)			Depth Range	
	Nos. of Bhs.	Min	Max	Nos. of Bhs.	Min	Max	Min	Max
VIII	142	0.41	3.65	137	0.41	2.91	53.66	439.61
Parting	140	20.82	45.86					
VII	141	7.08	16.81	136	6.96	15.24	86.00	486.40
Parting	133	35.76	46.34					
VI	135	0.45	3.25	127	0.76	3.25	138.05	486.25
Parting	126	12.1	28.16					
V TOP	126	0.22	3.57	119	0.49	3.55	164.45	438.24
Parting	115	0.80	6.16					
V BOT	116	0.05	1.59	75	0.23	1.59	169.95	445.15
Parting	102	11.27	27.52					
IV	110	0.18	2.62	100	0.44	2.62	186.05	467.00
Parting	98	22.88	42.12					
IIIA	104	0.23	2.28)	92	0.23	2.28	210.95	494.25
Parting	75	7.65	24.02					
III COMB	64	0.14	5.40	50	0.40	4.39	225.65	506.00
Parting (IIIA & III TOP)	13	12.97	22.01					
III TOP	13	0.2	3.23	11	0.43	3.23	250.02	338.94
Parting	13	1.08	3.75)					

4.2 SEAM WISE ANAYSIS FOR ITS WORKABILITY AND PRESENT STATUS

For the assessment of underground mining potentiality of the seams in the said geological block, detailed seam wise analysis have been done. The analysis of the seams have been done based on the geological information of the GR of the block, available plates of GR like isochore plan, seam structure, borehole litho log, geological model of the block. Considering available proven technology for coal mining in India, seam /sections having thickness >1.5m have been considered as workable seam/sections. Seams having thickness <1.5m have been considered non workable. Detailed seam wise status of the seams present within the considered geological block are as under:

Seam/ Section	Seam wise Status
VIII	Seam is present over the entire block area of 18.5 sq.km. Seam considered for opencast planning in rise side of the property for 13.5 sq.km. Rest of the area around 5.0sq.km is left in dip side of the block. Out of balance left out area (5.0 sq.km), around 3.11 sq.km on dip side has been used for external dump and rest around 1.89 sq.km area for pit top infrastructure of proposed opencast. This seam is workable in entire left out area having general thickness 1.5m to 2.0m except few isolated non workable patch having thickness less than 1.5m.
VII	Seam is present over the entire block area of 18.5 sq.km. Seam considered for opencast planning in rise side of the property for 13.5 sq.km. Rest of the area around 5.0sq.km is left in dip side of the block. Out of balance left out area (5.0 sq.km), around 3.11 sq.km on dip side has been used for external dump and rest around 1.89 sq.km area for pit top infrastructure of proposed opencast. This seam is workable in entire left out area having general thickness 12m to 15m.
VI	Seam is virgin and present within the entire block. Major part of the area is workable having thickness range in workable area 1.5m to 2.5m (approx.) with isolated non workable patches having thickness less than 1.5m distributed over the entire block area.
V TOP	Seam is virgin and present within the entire block. Major part of the area is workable having thickness range in workable area 1.5m to 2.5m (approx.) with isolated non workable patches having thickness less than 1.5m distributed over the entire block area.
V BOT	Virgin but non workable due to low seam thickness (<1.5m) in the entire block.
IV	Seam is virgin but non workable in major part of the area due to low seam thickness (<1.5m). A patch around 4.5 sq.km area in dip side shows workable seam thickness >1.5m, which may be considered for mining.

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IIIA	Seam is virgin but non workable due to low seam thickness (<1.5m) in the entire block except few isolated small workable patches (>1.5m thickness), which are practically difficult to work.
III COMB	Seam is virgin but non workable due to low seam thickness (<1.5m) in the entire block except one isolated workable patch (>1.5m thickness) in the rise side of the property, which is practically difficult to work. Approaching this workable will require huge drivage in thin zone area.
III TOP	Virgin but non workable due to low seam thickness (<1.5m) in the entire block.

N: B: The above stated workability is as per the isochore plan of GR. The isochore of the seams are drawn based on I_{100} analysis of the borehole data. For UG planning isochore based on I_{30} will be required. The present isochore may change on I_{30} analysis. Accordingly seam thickness and quality may change. In addition to that workability of seams may also change after I_{30} analysis.

4.3 SEAMS SELECTED FOR UG MINING & REASONS FOR SELECTION

On the basis of above observations seams / sections selected for underground mining are seam-VIII & VII in left out area and seam-VI, V(Top) and IV in the entire workable area(> 1.5m thickness) of the block. The reasons for selection of the seams for underground mining are as under:

Seam/ Section Selected for UG Mining	Reasons for selection
VIII	This seam is workable in entire left out area having general thickness 1.5m to 2.0m except few isolated non workable patch having thickness less than 1.5m.
VII	This seam is workable in entire left out area having general thickness 12m to 14m.
VI	Major part of the area is workable having thickness range in workable area 1.5m to 2.5m (approx.)
V TOP	Major part of the area is workable having thickness range in workable area 1.5m to 2.5m (approx.)
IV	Seam is workable in a patch around 4.5 sq.km area in dip side having seam thickness >1.5m.

4.4 SEAMS NOT SELECTED FOR UG MINING & REASONS FOR NOT SELECTION

The reasons for non-selection of the seams for underground mining are as under:

Seam/ Section Not Selected for UG Mining	Reasons for non-selection
V BOT	Non workable due to low seam thickness (<1.5m) in the entire block.
IIIA	Non workable due to low seam thickness (<1.5m) in the entire block except few isolated small workable patches (>1.5m thickness), which are practically difficult to work.
III COMB	Non workable due to low seam thickness (<1.5m) in the entire block except one isolated workable patch (>1.5m thickness) in the rise side of the property, which is practically difficult to work. Approaching this workable will require huge drivage in thin zone area.
III TOP	Non workable due to low seam thickness (<1.5m) in the entire block.

4.5 DETAILS OF GEOLOGICAL RESERVE

Seam wise geological reserve (M.Te) within the considered geological block are given below:

Seam	Reserve (M.Te)	Seam	Reserve (M.Te)
VIII	51.256	III COMB	21.7382
VII	325.5813	III TOP	2.6811
VI	49.4889	III BOT	0
V TOP	47.7239	II COMB	8.194
V BOT	5.2257	II TOP	0.0627
IV	25.732	II BOT	0.2136
IIIA	22.484	GRAND TOTAL	560.3814

5 TENTATIVELY ESTIMATED EXTRACTBLE RESERVE

5.1 ESTIMATED MINEABLE RESERVE (M.Te) OF SEAMS CONSIDERED FOR UG MINING

The details of estimated mineable reserve of the seams considered for underground mining are as under:

Seam Name	Geo. Res as per GR	Geo. Res. Considered in Opencast	Balance Geo. Res.	Estimated Extractable Reserve (M.Te)
VIII	51.256	36.50	14.76	6.00

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VII	325.5813	235.21	90.37	17.00
VI	49.4889	0	49.49	18.00
V TOP	47.7239	0	47.72	17.00
IV	25.732	0	25.73	4.00
Total	499.78	271.71	228.07	62.00

Note: The above estimated extractable reserve is tentative. This estimated extractable reserve may change while doing detailed planning for proposed underground. In addition to that this reserve are based on isochore plan prepared on I_{100} basis. This extractable reserve may also change as per isochore on I_{30} basis. The above extractable reserves are estimated considering deployment of long wall and Bord & Pillar with CM wherever possible. Hence, this extractable reserve may also change with change in technology. The percentage of extraction of some of the seams appears low due to presence of non-workable patches within workable area which makes some of the workable area practically not workable and higher thickness of seam. The above estimated extractable reserve may change on detailed planning of the UG project.

6 MINE ENTRIES

The possible location of mine entries have been examined for the extraction of seams by underground mining methods in left out area of seam-VIII & seam-VII and other underlying virgin seams. Seam-VIII & seam-VII is proposed to be extracted by proposed opencast in rise side of the property up to a depth of 300m. Due to proposed opencast workings, presence of internal dump in de-coaled area and external dump in dip side of the property, it is difficult to approach the coal seam from dip side, rise side and centre of the property. The only possible option to approach the seam-VIII & seam-VII is from the batter of proposed opencast. Hence, it is proposed to approach seam-VIII from the OB Bench batter (Seam-VII). After approaching seam-VIII from the batter through Inclined entries, main trunk shall be developed along the dip of the property and auxiliary trunk heading shall be developed along strike in the dip side batter of proposed opencast after leaving a protective barrier of at least 60m from top edge of quarry. From this auxiliary trunk heading, set of two drifts from the floor of seam-VIII shall be made to approach other underlying seams up to seam-IV (location of mine entries are marked on final stage quarry plan attached with the report). The seams below seam-IV are either not workable in the entire property or workable in patches which is difficult to approach. Hence mine entries up to seam-IV have been considered for the proposed underground project. Seam-IV is also workable in patch but patch is large. So this has been

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considered for proposed UG mining. The tentative location of entries has been finalised with due consideration of mining & dumping strategy of opencast. The number of airshafts and their depth, length & dimensions of inclined entries and drifts from seam-VIII to seam-IV and their location may change while doing detailed planning. The tentative details of mine entries for the proposed underground project are given in table below.

Mine Entries	Gradient	Depth / Length	Dimension	Location	Purpose
Inclined Entry-1	1 in 4.5	360m	5.5m x 3.0m	OB Bench of Seam-VIII, near CMSBD-24 borehole	Intake + FSV / MUV
Inclined Entry-2	1 in 6	300m	5.5m x 3.0m	OB Bench of Seam-VIII, near CMSBD-24 borehole	Intake + Belt
Drift-1 (Seam-VIII to Seam-IV)	1 in 6	840m	5.5m x 3.0m	Near CMSBD-149 borehole	Intake + FSV/ MUV
Drift-1 (Seam-VIII to Seam-IV)	1 in 4.5	630m	5.5m x 3.0m	Near CMSBD-149 borehole	Intake + Belt
Airshaft-1	Vertical	365m	5.0m Dia	Near borehole CMSBD-58	Return
Airshaft-2	Vertical	184m	5.0m Dia	Near borehole CMSBD-147	Return
Airshaft-3	Vertical	308	5.0m Dia	Near borehole CMSBD-135	Intake

N: B: Length and position of entries may change after detailed study for coal exposure of seam-VIII in benches & toe position of internal dump during detailed planning. Present length of entries is based on primary study of available data / plan/ information.

Considering the maximum extent along dip (around 6.5km) and along strike (around 4.5km) in rise side of the block (i.e. North-eastern and southern side of the block), peripheral system of ventilation will be required. Hence space for airshaft should be left considering the future underground mining of underlying virgin seams. As per CMR 2017, toe of any dump should be at least 100m away from the mine entries. Hence, the dumping of proposed opencast should be planned keeping 100m away from the proposed locations of mine entries. Pit boundary should also be finalised after leaving the area for mine entries. The area for pit top infrastructure and locations of mine entries are marked on the final stage quarry plan attached with this report for consideration of pit planning and dump planning.

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Annexure-**XIV**

7 MINING STRATEGY

7.1 GEOMINING PARAMETERS OF THE SEAMS CONSIDERED FOR UG MINING

Geo-mining parameters of the seams considered for UG mining are as under:

Sl. No.	Parameters	Data / Information
1	Area of considered Block Bandha Block	18.5 Sq.Km
2	Total Mining area considered for opencast (seam-VIII & Seam-VII)	13.5 Sq.Km
3	Area considered for External dump within the block in dip side (approx.)	3.11 Sq.Km
4	Area considered for Pit top infrastructure of proposed opencast (approx.)	1.89 Sq.Km
4	No. of borehole Drilled within block	164
5	Boreholes density (BHs/sq.km) of blocks	9.0
6	Borehole intersection of the seams considered for UG (Seam-VI, Seam-V(T) & IV seam)	6 to 7
7	General seam Thickness Range of seams considered for UG as per Isochore Plan(Approx.)	
a	Seam-VIII (in Left out area)	1.5m to 2.0m
b	Seam-VII (in left out area)	12m to 15m
c	Seam-VI	0.76m to 3.25m
d	Seam-V(T)	0.49m to 3.55m
d	Seam-IV	0.44m to 2.62m
8	Depth of seam (approx.) from surface of seams considered for UG mining (as per BH intersection in the considered GR.	
a	Seam-VIII (in Left out area)	180m to 436m
b	Seam-VII (in left out area)	240m to 495m
c	Seam-VI	138m to 486m
d	Seam-V(T)	164m to 438m
d	Seam-IV	186m to 467m
9	Height of OB dump over the UG Mining area from original surface RL	120m
10	Paring Between seams (as per GR)	
a	Between seam-VII & Seam-VIII	20.82m to 45.86m

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b	Between seam-VI & Seam-VII	35.76m to 46.34m
c	Between seam-V(Top) & Seam-VI	12.1m to 28.16m
d	Between seam-IV & Seam-V(Top)	12.12m to 35.27m
11	Grade of Coal (in band) as per GR of the seams considered for UG mining in the said coal block(as per I100 Sample)	
a	Seam-VIII (in Left out area)	G7 to G17
b	Seam-VII (in left out area)	G7 to G12
c	Seam-VI	G6 to G15
d	Seam-V(T)	G4 to G12
d	Seam-IV	G4 to G15
12	HGI of coal seams considered for UG mining	
a	Seam-VIII (in Left out area)	63 to 86
b	Seam-VII (in left out area)	50 to 67
c	Seam-VI	46 to 78
d	Seam-V(T)	54 to 72
d	Seam-IV	51 to 77
13	Gradient of the seam in the proposed mining area	2º to 8º
14	Immediate Roof & Floor of seams considered for UG mining	
a	Roof and Floor of Seam-VIII : Immediate roof of the seam is represented predominantly by medium to coarse-grained sandstone and shale, immediate floor is composed of shale, intercalations of shale and sandstone, sandy shale, carbshale high	
b	Roof and Floor of VII Seam: Immediate roof of the seam is represented predominantly by medium to coarse-grained sandstone, immediate floor is composed of Shale, intercalations of shale and sandstone, or sandy shale.	
c	Roof and Floor of Seam-VI: Immediate roof of the seam is represented predominantly by medium to coarse-grained sandstone, immediate floor is composed of intercalations of shale and sandstone, or sandy shale.	
d	Roof and Floor of seam-V (Top): Immediate roof of the seam is represented predominantly by medium to coarse-grained sandstone, immediate floor is composed of Shale, intercalations of shale and sandstone, or sandy shale.	
e	Roof and Floor of Seam-IV : Immediate roof of the seam is represented predominantly by medium to coarse-grained sandstone, immediate floor is composed of sandstone, intercalations of shale and sandstone, or sandy shale	
15	Degree of Gassiness	Not Known

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	(Degree of gassiness of the seam is not known. This has to be determined for the project.)	
16	Details of Reserve	
a	Geological Reserves of the Block	560.38 M.Te
b	Geological Reserves Considered for opencast	271.71 M.Te
c	Geological Reserve Considered for UG Mining (>1.5m thickness)	228.07 M.Te
d	Estimated Tentative Extractable Reserves of seams considered for UG Mining	62.0 M.Te.
e	Percentage of extraction w.r.t Geological Reserve Considered	27% (approx.)
Note: The above geo-mining parameters are based on the geological report considered for preparation of conceptual report. This may change while actual mining & planning for the proposed UG mining area.		

7.2 BROAD MINING STRATEGY

Broad mining strategy for the proposed underground has been formulated considering the geo-mining parameters of the seams considered for underground mining and anticipated surface constraints as well as underground constraints of the geological block considered for UG mining. The anticipated surface constraints for the proposed underground may be the proposed opencast workings in upper seams (i.e. in seam-VIII & Seam-VII) in part of the area and external and internal OB dump in the geological block area. The underground constraint for the proposed underground may be inter seam parting between seams, frequent thinning of seams and randomly distributed small non workable patches of different seams within the considered UG mining area.

7.3 BROAD STRATEGY TO DEAL SURFACE CONSTRAINTS

The sequence of mining for the proposed opencast is in such a way that there will be either active working or dumping through the life of the opencast project. Hence preparation of mine entries to approach the seams will be difficult. In addition to that depillaring below active working & active dumping will not be permitted by DGMS. Hence simultaneous operation of UG mining operation and opencast mining operation will not be practically possible. Hence it is proposed to extract the seams by underground mining method after completion of opencast mining operation in overlying seams and dumping operation in the considered UG mining area. External and internal dumping as well as pit boundary for the proposed opencast should be planned after leaving the space with due consideration of safety for proposed mine entries as marked on the final stage quarry plan attached with this report.

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7.4 BROAD STRATEGY TO DEAL ANTICIPATED UG CONSTRAINTS

- Parting between seams are generally less than 60m. The immediate underlying seam of seam-VII (i.e. quarry floor of proposed OC) is seam-VI. The parting between seam-VII & Seam-VI varies from 35.76m to 46.34m which is less than 60m. The quarry is proposed to be filled up with OB dump up to a height of 120m from original surface profile. Extraction of seam-VI shall be done only after getting permission from DGMS.

- The underlying seams of seams considered for opencast mining shows frequent thinning of seams (i.e. thickness <1.5m). With the available proven technology for Indian coal mining, seams thickness less than 1.5m is difficult to work as on date. Delineation of UG mining area in seams have been done considering the seam thickness >1.5m as workable seam / section per isochore plan. Area less than 1.5m have been considered as non-workable.

- The seams considered for UG mining area shows random distribution of non-workable patch in workable area which makes some of the workable area practically difficult to approach. Hence, panel layout needs to be done avoiding non workable patch wherever possible.

8 METHOD OF MINING

The geo-mining parameters of the seams considered for underground mining has potential for deployment of mass production technology as long wall as well as Bord & Pillar with continuous miner. The gate road development may be done with Bolter Miner.

8.1 TENTATIVE PRODUCTION CAPACITY & EXPECTED LIFE OF UG PROJECT

Tentative production capacity for the project may be around 1.80 Mty. The details of estimated production capacity are as under: Total estimated extractable reserve is around 62.0 M.Te. Expected production life of UG project with above tentative rate of production may be around 35 Years. This estimated production capacity and production life of the project may change while doing actual planning for UG mines.

9 USE OF PIT TOP INFRASTRUCTURE OF OPENCAST

Since the underground mining will be started after completion of opencast mining operation, the pit top infrastructure shall be used by the proposed underground wherever possible.

10 LIMITATIONS WITH THE UG PROJECT

- Geological reserve of the seam have been estimated based on I_{100} analysis of borehole data for determination of seam thickness. This estimation has been done considering the opencast mining of the seams. But for underground mine planning Isochore on I_{30} analysis will be required. If we will go

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for I_{30} analysis, some of the seams showing workable thickness may become non workable due to splitting of seams on I_{30} analysis.

- The parting between floor of the proposed quarry and immediate underlying workable seams have parting less than 60m. The proposed quarry is to be filled up with OB.
- The grade of coal is inferior (ranging from G4 to G17). Probability of financial viability of the project appears low.
- Simultaneous opencast & underground mining in the said geological block is practically not possible. Hence UG project may be started after completion of proposed OC mining & dumping operations.
- The borehole density of underlying seams are low hence degree of confidence for underground mining will be low unless additional borehole is drilled to increase the borehole density.
- Mining in seam-IV will require long thin seam drivage to approach the workable patch.

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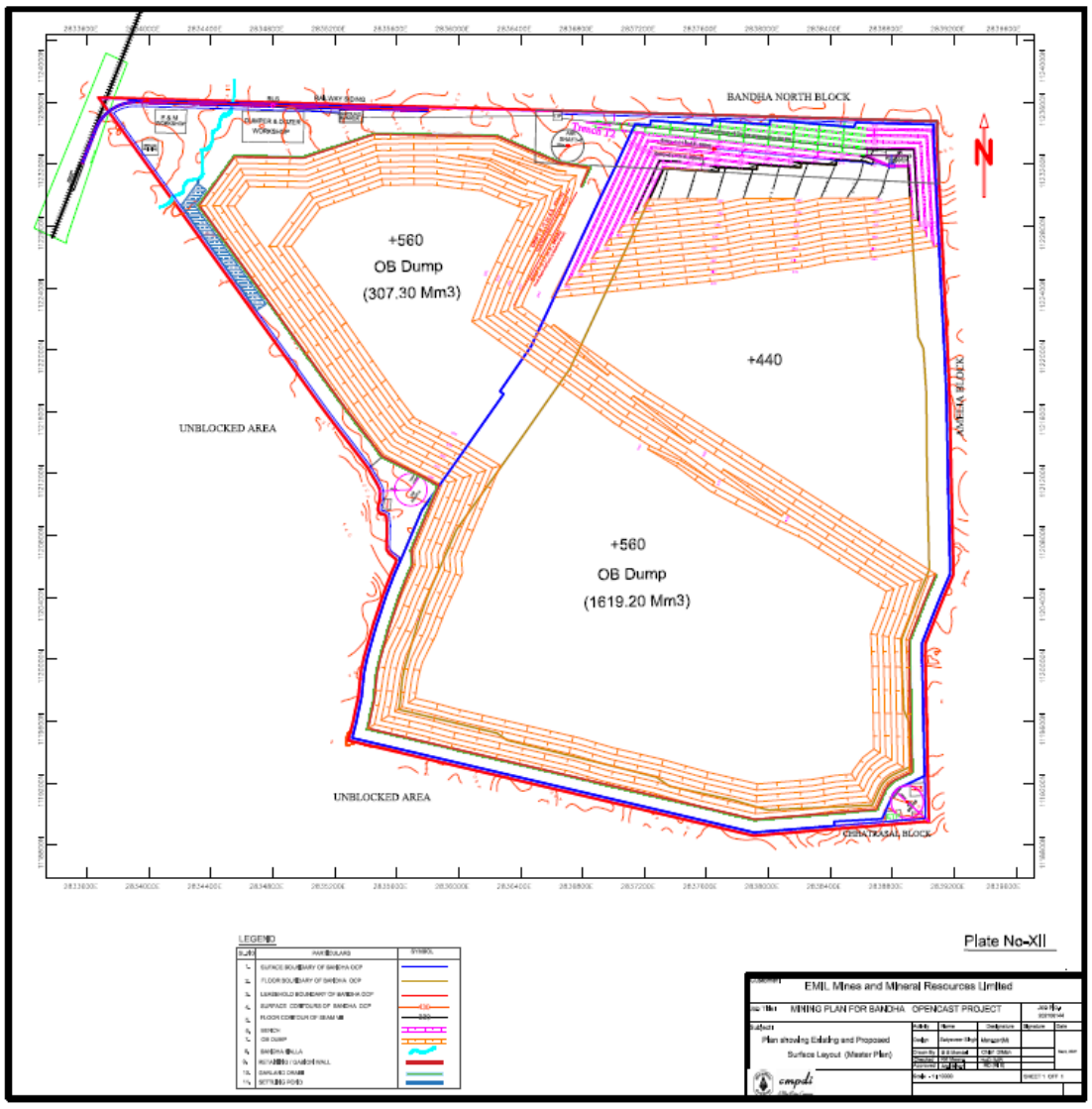
Annexure-**XIV**

FINAL STAGE QUARRY PLAN OF PROPOSED OPENCAST (MASTER PLAN)



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Additional Annexure-15

File No.NA-710/5/2018-NA

Annexure- XV

F.No NA-710/5/2018-NA
Government of India
Ministry of Coal
Office of Nominated Authority
******

120-F, Shastri Bhawan, New Delhi
Dated: the 19th July, 2021

OFFICE MEMORANDUM

Sub: Relaxation under the event of Force Majeure due to 2nd wave of COVID pandemic.

In view of Force Majeure request in line with the Allotment Agreement/ Coal Mine Development And Production Agreement received by the Nominated Authority seeking relaxation in efficiency parameters, the Competent Authority is pleased to grant relaxation of three months in the efficiency parameters as detailed below:

a. For operational coal mine: Relaxation of **3 months** i.e. the production schedule as per Mine Plan will be adjusted on pro-rata basis for the Financial Year 2021-22.
b. For non-operational coal mine: Relaxation of **3 months** in the timelines of all the Efficiency Parameters whose due date of achievement falls on or after 1 st April, 2021 .

2. This is for your kind information and needful please.

(Manish Uniyal)
Under Secretary to Government of India
011-23384106

To
List of Allocattee as Annexed

Prepared By Atal Bihari On 30/10/2021

280129/2021/Nominated Authority

Sl. No.	Mine	State	Successful allocattee	Force Majeure Request received
1	Belgaon	Maharashtra	Sunflag Iron and Steel Ltd	Yes
2	Takli-Jena-Bellora (North) &Takli-Jena-Bellora (South)	Maharashtra	Aurobindo Reality And Infrastructure Private Limited	Yes
3	Marki Mangli II	Maharashtra	Yazdani International Private Limited	Yes
4	Dhirauli	Madhya Pradesh	Stratatech Mineral Resources Private Limited	Yes
5	Urtan	Madhya Pradesh	JMS Mining Private Limited	Yes
6	Urtan North	Madhya Pradesh	JMS Mining Private Limited	Yes
7	Bandha	Madhya Pradesh	EMIL Mines And Mineral Resources Limited	Yes
8	Sahapur East	Madhya Pradesh	Chowgule And Company Private Limited	Yes
9	Suliyari	Madhya Pradesh	APMDCL	Yes
10	Bikram	Madhya Pradesh	Birla Corp. Ltd	Yes
11	Brahampuri	Madhya Pradesh	Birla Corp. Ltd	Yes
12	SialGhoghri	Madhya Pradesh	Reliance Cement Company Private Limited	Yes
13	Sahapur West	Madhya Pradesh	Sarda Energy And Minerals Limited	Yes
14	Chotia	Chhattisgarh	BALCO	Yes
15	Gare Palma IV/8	Chhattisgarh	Ambuja Cements	Yes
16	Talaipalli	Chhattisgarh	NTPC	Yes
17	Gidhmuri & Paturia	Chhattisgarh	Chhattisgarh State Power Generation Co. Ltd.	Yes
18	Gare Palma IV/7	Chhattisgarh	Sarda Energy & Minerals Limited	Yes
19	Gare Palma Sector -II	Chhattisgarh	Maharashtra State Power Generation Co. Ltd. (Mahagenco)	Yes
20	Jamkhani	Odisha	Vedanta	Yes
21	Radhikapur (East)	Odisha	EMIL Mines and Mineral Resources Limited	Yes
22	Dulanga	Odisha	NTPC	Yes
23	New Patrapara	Odisha	NTPC	Yes
24	Khagra Joydev	West Bengal	DVC	Yes
25	Moitra	Jharkhand	JSW STEEL LIMITED	Yes
26	Kotre basantpur & Pachmo	Jharkhand	CCL	Yes
27	Brahmdiha	Jharkhand	Andhra Pradesh Mineral Development Corporation Ltd	Yes
28	Chakla	Jharkhand	HINDALCO INDUSTRIES LIMITED	Yes
29	Rajhara North (Central & Eastern)	Jharkhand	Fairmine Carbons Pvt Ltd	Yes
30	Gondulpara	Jharkhand	Adani Enterprises Ltd	Yes
31	Urma Paharitola	Jharkhand	Aurobindo Reality And Infrastructure Private Limited	Yes

280129/2021/Nominated Authority

Sl. No.	Mine	State	Successful allocattee	Force Majeure Request received
32	Amarkonda Murga Dangal	Jharkhand	ECL	Yes
33	Brahmini & Chichro Parsimal	Jharkhand	ECL	Yes
34	Badam	Jharkhand	Bihar State Power Generation Co Ltd	Yes
35	Banhardih	Jharkhand	Jharkhand Urja Utpadan Nigam Ltd	Yes
36	Tubed	Jharkhand	DVC	Yes
37	Chatti Bariatu, Chatti Bariatu South	Jharkhand	NTPC Ltd	Yes
38	Kerandari	Jharkhand	NTPC Ltd	Yes
39	Rajbar D & E	Jharkhand	Tenughat Vidyut Nigam Ltd	Yes
40	Tokisud North	Jharkhand	NMDC Ltd.	Yes
41	Pachhwara Central	Jharkhand	Punjab State Power Corp Ltd	Yes
42	Dumri	Jharkhand	HINDALCO	Yes
43	Kathautia	Jharkhand	HINDALCO	Yes
44	Saharpur Jamarpani	Jharkhand	UP Rajya Vidyut Utpadan Nigam Ltd	Yes

Additional Annexure-16

FTS-300647/2021/O/o AS(VKT)

Annexure- XVI
(Revised Allocation Order)

Government of India
Ministry of Coal
Office of Nominated Authority
******

120-F, Shastri Bhawan, New Delhi
01st/05th November, 2021

Corrigendum No. 1 to the Allocation Order no. NA-104/5/2020-NA dated March 03, 2021

In re:	**Bandha Coal Mine** (the "block") particulars of which is specified in **Annexure 1**
Order no.:	**NA-104/5/2020-NA**
Date:	~~October 28, 2021~~ November 05, 2021
In favour of:	**EMIL Mines and Mineral Resources Limited,** incorporated in India under the Companies Act, 2013 with corporate identity number U14290WB2020PLC236717, whose registered office and principal place of business is at Industry House, 18th Floor, 10 Camac Street, Kolkata, West Bengal 700017, India (the "Successful Bidder")
For the purpose of:	Sale of coal, including sale to Affiliates and related parties, utilisation of coal for any purpose including but not limited to captive consumption, Coal Gasification, Coal Liquefaction and export of coal.

WHEREAS, the Nominated Authority has, in accordance with the provisions of the Mines and Minerals (Development and Regulation) Act (the "Act") and the Coal Blocks Allocation Rules, 2017 (the "Rules") conducted the auction of the block;

AND WHEREAS, the Nominated Authority has, in accordance with provisions of the Act and the Rules issued the Allocation Order no. NA-104/5/2020-NA dated March 03, 2021.

AND WHEREAS the Successful Bidder has requested for amendment in the particulars of the block specifically the name of the villages, tehsil, district and revision in bounding co-ordinates for the block in the Allocation Order.

Tiwari

AND WHEREAS considering such request the matter was examined and it was felt necessary to modify Annexure 1: Particulars of the block.

NOW THEREFORE, following corrigendum to the Allocation Order is issued:

1. In Annexure 1: Particulars of the block, the name of the villages, tehsil and district and the co-ordinates have been modified as provided below:

Annexure 1: Particulars of the block

Name of Coal Block	**Bandha**
Latitude	24°04'17" N - 24°06'52" N (Provisional)
Longitude	82°21'39" E - 82°24'57" E (Provisional)
Villages	Bandha,Tenduha,Pidarwah,Deori,Pachur
Tehsil/ Taluka	Sarai
District	Singrauli

(V K Tiwari)
Additional Secretary & Nominated Authority

Additional Annexure-17

Annexure-XVII

Compliance of Observations of the Scrutiny Committee	
Application No	APP0063
Name of Mine	Bandha Coal Mine
Name of Project Proponent	BACHA PRASAD

S.No	Parameters	Final Observation Details	Remarks
INPUT SHEET			
6	a. Targeted capacity b.Peak Capacity (150% of the rated capacity)	Instead of Target Capacity and Peak Rated Capacity, Rated capacity and Peak Capacity shall be mentioned.	Targeted capacity a. Rated Capacity – 5Mtpa b. Peak Capacity (150% of rated capacity) – 7.5Mtpa **Data has been filled correctly but SWC site does not show properly.**
1. PROJECT INFORMATION			
1.3.7	Production Schedule as per opening permission (meeting provisions of CMDPA if any) / Allotment Agreement	Scheduled date of mine opening permission as per CBDPA is 3/9/2026. However, in the proposed Mining Plan coal production has been proposed from year 2028-29. Reason for this delay may be provided.	The stripping ratio of this mine is a very high (Avg. SR 9.76). The block is in the deep side of the seam and in-crop zone of any seam is not falls within the block. So minimum depth of the top most seam is around 60m and a trench type of entry has been proposed to access the coal seam. Around 30Mm3 of OB has to be removed during the trench formation before exposing the coal seam-VIII. So coal production has been proposed from 2028-29 (Yr-2) though mine has been proposed to start in 2026-27 (Yr-0). Scheduled date of mine opening permission as per CBDPA is 3/9/2026, but A relaxation of 3 months in the timeline of all the efficiency parameters has been provided vide letter No. NA-710/5/2018/NA dated 19.07.2021.
1.5.7	Net Geological Block “Ha”	1. As per guidelines it should be Net Geological Block ‘‘Ha’’. It shall be noted that the format shall not be changed under any circumstances. 2. In the proposed Mining Plan ,Geological Reserve has been indicated as 610.61, which is not matching with Geological Reserve in summary of mine.	1. Heading as provided in SWCS site is “geological block area yet to be projectised “Ha” as provided in site itself which has not been changed by user. 2. 610.61 Mt is Gross Geological reserve of the block which accounts 502.29 Mt of Proved Gross Geological reserve and 108.32 Mt of Indicated reserve, while 560.38 Mt is net geological reserve, which accounts 452.06 Mt of Proved Net Geological reserve and 108.32 Mt of Indicated reserve.
1.5.15	Extractable Reserves “Mt”	What is the corresponding Net Geological Reserves considered for opencast Mining.	There is no rows for net geological reserves of considered reserve in Opencast mining. Corresponding net geological reserve of extractable 197.00 Mt reserve by Opencast mining is 271.71 Mt
1.5.16	% of Extraction/ recovery	Percentage of Extraction/ recovery is very less (33.155%). To be explained.	Recovery is not 33.155% . it is 35.155% as mentioned in Mining Plan. Recovery of 35.155% has been calculated by the system on the basis of total 560.38 Mt. Geological reserve of the block While it would be 72.50% considering projectised geological reserve of 271.71 Mt.
1.5.24	Handling of Rejects	Data to be furnished.	**S.No. 1.5.23 coal beneficiation envisaged is unchecked while handling of rejects – not applicable but due to SWCS problem it is shown blank.**
2. EXPLORATION, GEOLOGY, SEAM SEQUENCE, COAL QUALITY & RESERVE			
2.2.2	Local geology, Structure, Stratigraphic sequence, Characteristics of the litho-logical units (coal seams /partings/overburden).	Data to be furnished.	**Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.4	Status of Exploration of the block	Data to be furnished.	Explored (Some patches of forest area require more exploratory drilling for more confidence in reserve estimation). **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.5	Area covered by ‘detailed’ exploration within the block (sq. km)	Data to be furnished.	18.5094 Square Km. **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.6	Whether entire lease area has been covered by ‘detailed’ exploration.	Data to be furnished	Yes Some patches of forest area require more exploratory drilling for more confidence in reserve estimation. **Already data has been filled but may not be shown in report due to SWCS website problem**
2.2.7	No. of boreholes drilled within the block	Data to be furnished.	164 No. of BH **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.8	Whether any further exploration/study is required or suggested and time frame in which it is to be completed	Data to be furnished.	Some more drilling is required in forest area due to lesser borehole density (as per requirement) in some patches of forest area. Borehole may be drilled after getting forestry clearance. About 17500m of drilling has been proposed in zone of indicated reserve in a phased manner as found suitable by PP probably starting from year 2026 and may be completed in next 3 to 4 years. **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.9	Year wise future programme of exploration	Data to be furnished	Approx. 50BH of 17500m drilling has to be done in 3 years. Year wise drilling programme is not possible to provide in SWCS site as addition of rows is not provided in SWCS for 2.2.9 **(Problem has been communicated to IT division). Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.10	Overall borehole density within the block (no./ sq. km) approx	Data to be furnished.	Overall BH density is 9. **Already data has been filled but may not be shown in report due to SWCS website problem**
2.2.11	No of Seams available as per GR (Geological Report)	Data to be furnished.	Total 8 No. of seams (Seam VIII,Seam VII,Seam VI,Seam V-TOP,Seam V-BOT,Seam IV,Seam III-A,Seam III-COMB,Seam III-TOP,Seam III-BOT,Seam II-COMB,Seam II-TOP,Seam II-BOT) is in the block as per GR. **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.12	Seams not considered for Mining with	Data to be furnished.	Seam-VIII and VII are considered for opencast mining. All seams below Seam-VII are not favourable for Opencast mining due to high Stripping Ratio and dumping constraints. Seams below Seam-VII may be mined out by Underground Mining Method. **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.13	Dip of the Seam	Data to be furnished.	2 deg to 8 deg NW A**lready data has been filled but may not be shown in report due to SWCS website problem**
2.2.14	Seam wise thickness, depth and reser	Data to be furnished.	**Already data has been filled but may not be shown in report due to SWCS website problem**
2.2.15	Methodology of reserves estimation (also mention if any software package has been used).	Data to be furnished.	**Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.16	Average GCV “KCal/kg”	Data to be furnished.	Grade of the Seam VIII varies from G7 to G17 (Avg. G12) and Grade of the Seam VII varies from G7 to G12 (Avg. G9). The overall grade of reserve proposed to be extracted by Opencast is 4560 (G-10). **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.17	Gross Geological Reserve of the block “Mte	Data to be furnished.	610.61 Mt (502.29 Mt Proved Gross Geological Reserve + 108.32 Mt Indicated Reserve) **Already data has been filled but may not be shown in report due to SWCS website problem**
2.2.18	Net Geological Reserve of the block “Mte”	Data to be furnished.	560.3800 Mt (452.06 Mt Proved Net Geological Reserve + 108.32 Mt Indicated Reserve) **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.19	Minable Reserve of the block “Mte”	Data to be furnished	207.35 Mt. **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.20	Blocked Reserve “Mte	Data to be furnished.	64.36 Mt **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.21	Corresponding extractable reserve of	Data to be furnished.	197.00 Mt **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.23	Reserve already depleted (Base date of Mining Plan)	Data to be furnished	Nil. **Already data has been filled but may not be shown in report due to SWCS website problem**
2.2.22	Percentage of Extraction	Data to be furnished	35.155% on total reserve of 560. 38 Mt. **Already data has been filled but may not be shown in report due to SWCS website problem.**
2.2.24	Balance Reserve (as on Base Date)	Data to be furnished	197.00 Mt. **Already data has been filled but may not be shown in report due to SWCS website problem.**
3. MINING			
3.1.1	Existing method of mining if the mine is under operation	Details regarding other mine operators need not be provided.	Bandha Block is a virgin block. Details of other mine operator has been removed.

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3.1.2	Proposed method of mining with justification on suitability of method of mining	1. Opencast mining has been proposed up to 230m depth only. Possibility to be explored to mine coal reserves at a greater depth by opencast method so that exploitation of coal reserves in the coal block can be maximized. 2. Reserves, which have not proposed to be mined by opencast method, are proposed to be mined by underground method and a conceptual report prepared by CMPDI regarding this has been attached as annexure. However detailing as per Para 3.1.2 of Guidelines for preparation of Mining Plan issued by MoC dated 29.05.2020 has not been done in the report	1) There is no extra land available for External OB dumping outside of the Bandha Coal Block as all sides of the block are coal bearing area. So the removed OB waste material during Opencast mining operation has to be accommodated in dip side of the block as External Dump and backfilled dump accommodation as Internal Dump. The limit of Opencast mining has been optimised to accommodate the produced OB upto 120m above Avg. OGL in the leasehold of the block and therefore, Opencast mine is technically feasible only upto 230m for seam VIII and VII. 2) Some of the forest patches of the block has very less bore hole density due to non-availability of permission of drilling in Forest Area. Therefore, out of 560.38 Mt reserve, 108.32 Mt reserve is marked as Indicated reserve and 452.06 Mt reserve is Gross Proved Reserve in GR. Considering seam continuity opencast mine planning of Seam-VII and VIII has been done. Seam Wise Drilled BH is enlisted below: Seam - No. of BH VIII- 142 VII - 141 VI - 135 V TOP - 126 V BOT - 116 IV - 110 IIIA - 104 III COMB - 64 III TOP - 13 After getting FC from MoEF&CC, further 17500m drilling will be done as also proposed in Mining Plan. A fresh geological modelling of the lower seams considered in Conceptual Note on underground will be done and underground possibility will be further assessed after completing these activities. Due to above mentioned facts, only a Conceptual Note on underground possibility has been attached as Annexure in Mining Plan of Bandha Coal Mine (5 Mtpa). A detailed Planning with production schedule of Underground Mining will be provided in next Review Meeting of Mining Plan.
3.1.11	Whether negative proving for coal / lig	The proposed external dump area is over coal bearing area and it has not been projectized. The coal reserve under the external dump has been envisaged to be extracted by underground method of mining. In parameter 2.2.2 the thickness of seam VII has been mentioned as 7.08 m to 16.81m. In parameter 1.5.10 the unprojectised reserve of seam VII is 90.37 Mte and proposed to be extracted by underground mining method. It is requested to provide details of the borehole data in this unprojectised external dump area to ascertain the range of thickness of seam VII in this area. Considering the seam thickness it is requested to elaborate the method of extraction of seam VII and its percentage extraction in this area from coal conservation point of view.	The thickness of the Seam-VII below the external dump area marked as D2 varies from 7.08m-13.5m (Avg.-12m) and bore hole density of this area is around 8.8BH/sqr. Km. A mass production technology of underground e.g. Long wall mining method may be envisaged as also mentioned in Conceptual Note of underground mining method. Out of 500.94 Ha of unprojectised area below the external dump D2, 233.54 Ha is forest land and only 9 bore hole has been drilled for exploration in this forest area as permitted by forest department. The bore hole density in the forest area lies in unprojectised area of 500.94 Ha is around 3.86. This bore hole density is not sufficient for underground planning. So final certainty of the seam will be provided after more drilling in this area. A detailed Planning of Underground Mining with production schedule will be provided in next Review Meeting of Mining Plan.
6. LAND REQUIREMENT			
6.1.6	Proposed Rehabilitation programme	R&R shall be done as per existing laws. Proposed Draft R&R policy (Annexure XII) shall not be part of the Mining Plan and shall be removed.	R&R should be formulated as per RFCTLARR-2013. Annexure XII has been removed
8. PROGRESSIVE & FINAL MINE CLOSURE PLAN			
8.1.1	Land Degradation and restoration Sch	Post closure activities starts from year Y-44 though the life of the mine is 45 years. This shall be corrected.For determination of Y-1 of the project, Para 8.1 of the Guidelines of MoC dated 29.05.2020 shall be referred to.	Year 2026-27 is marked as Yr-0 (PC-6/C-1) due to overlap of this year to pre-construction and construction period. Some of the activity will be started in this year so this year has been considered in evaluating mine closure cost considering total life of the mine 45 year.
8.1.2	TentativeBiological Reclamation (Cumulative in "Ha")	Post closure activities starts from year Y-44 though the life of the mine is 45 years. This shall be corrected.For determination of Y-1 of the project, Para 8.1 of the Guidelines of MoC dated 29.05.2020 shall be referred to.	Year 2026-27 is marked as Yr-0 (PC-6/C-1) due to overlap of this year to pre-construction and construction period. Some of the activity will be started in this year so this year has been considered in evaluating mine closure cost considering total life of the mine 45 year.
OTHERS			
9.1	Undefined	1. As per allocation letter the name of mine is Bandha Coal Mine and at different places it has been mentioned as Bandha Opencast project. To be corrected. 2. Annexure XIII cannot be a part of the Mining Plan. It shall be removed. 3. Annexure XIV- For determination of Y-1 of the project, Para 8.1 of the Guidelines of MoC dated 29.05.2020 shall be referred to. 4. The comments made during Expert Review and point-wise compliance made shall be incorporated in the report. 5. Annexure 2B: Letter mentioned as Corrigendum of Vesting Order dated 05.11.2021 to be incorporated in the report.	1. As suggested, name of the project has been changed to Bandha Coal Mine. 2. As suggested Annexure-XIII has been removed from Mining Plan. 3. Year 2026-27 is marked as Yr-0 (PC-6/C-1) due to overlap of this year to pre-construction and construction period. Some of the activity will be started in this year so this year has been considered in evaluating mine closure cost. 4. Complied 5. Letter mentioned as Corrigendum of Vesting Order dated 05.11.2021 has been annexed in Annexure-1 (1-A).
9.2	Undefined	For UG workings 1. Plan showing mode and location of entries and surface layouts shall be furnished 2. Plan showing layout of the panel for each system shall be furnished 3. Plan showing layout of pillar extraction shall be furnished 4. Plan showing support system shall be furnished 5.Plan showing haulage and transport system shall be furnished. 6. All stages of mining shall be marked in distinct color in the working plan of each seam	May be provided after detailed exploration of the seams considered in underground mining method. A detailed Planning with production schedule of Underground Mining will be provided in next Review Meeting of Mining Plan.

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Additional Annexure-18

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)
गोन्दवाना प्लेस, कांके रोड, राँची - 834 031, झारखंड (भारत)
Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
Gondwana Place, Kanke Road, Ranchi - 834 031, Jharkhand (INDIA)
CORPORATE IDENTITY NUMBER - U14292JH1975GOI001223

पत्रांक: सीएमपीडीआई/मुख्या./E-699814 दिनांक: 26.02.2020

सेवा में,

General Manager (P&P),

Central Coalfields Limited

Darbhanga House,

Ranchi – 834008, Jharkhand

विषय : Minutes of meeting of the discussion with DGMS for finalization of depillaring below active dumping of Amlo expansion opencast.

महोदय,

A meeting between officials of Underground Mining Division (UMD), RI-3 from CMPDI Ranchi and officials of DGMS was held on 23.02.2021 in the chamber of Dy DG, DGMS to discuss various issues related to development & depillaring of underlying seams (seam-V & Seam-III) below proposed mining operation / active dumping of proposed Amlo expansion PR (5.0 Mty).

The minutes of the meeting is enclosed as Annexure-I of the letter.

This is for your information & necessary action at your end.

Thanking you.

भवदीय,

25/02/2021

(आनंदजी प्रसाद)
महाप्रबंधक (यूएमडी)

Copy to

1. Regional Director, RI-III, CMPDI, Ranchi.
2. GM (UG), Darbhanga House , Ranchi

फोन नम्बर / Phone No : +91 651 2230528
फैक्स नम्बर / Fax No. : +91 651 2231447, 2230528
वेब साईट / Website Address : http://www.cmpdi.co.in

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ANNEXURE-I

Minutes of the meeting held on 23.02.2021 to discuss various issues related to development & depillaring schedule of proposed Amlo UGP below proposed opencast mining operation of Amlo Expansion PR (5.0 Mty).

As per the minutes of meeting vide letter number GM (P & P)/20/2694 dated 19.10.2020, it was decided to hold a meeting with DGMS to discuss the difficulties in production scheduling of proposed Amlo underground due to opencast mining operation of proposed Amlo expansion PR . Accordingly, a meeting between officials of Underground Mining Division (UMD), RI-3 from CMPDI Ranchi and officials of DGMS was held on 23.02.2021 in the chamber of Dy DG, DGMS to discuss various issues related to development & depillaring of underlying seams (seam-V & Seam-III) below mining operation of proposed Amlo expansion PR.

List of participants are as under:

Underground Mining Division (UMD) of CMPDI Hq, Ranchi

1. Sri Anandji Prasad, GM (UMD)
2. Sri Pramod Kumar, Chief Manager(Mining)
3. Sri K. Pavan Kumar, Dy Manager (Mining)

Regional Institute-III, CMPDI, Ranchi.

1. Sri Manoj Kumar , Regional Director, Regional Institute-III, CMPDI, Ranchi
2. Sri Uma Shankar Singh, Chief Manager (Mining)

DGMS office, Ranchi

1. Sri M. Rafiq Sayeed, Dy. Director General , DGMS Ranchi
2. Sri Supriyo Chakraborty , Director of Mines Safety, DGMS, Ranchi

The following points & issues were deliberated and agreed during the meeting:

1. The meeting was chaired by Dy. Director General, DGMS Ranchi.

2. The various issues related to extraction of underlying seam-V & seam-III below proposed mining operation of Amlo Expansion PR (5.0 Mty) was deliberated by Underground Mining Division (UMD), CMPDI, HQ Ranchi and agreed in the meeting as mentioned below:

a) It was deliberated that Amlo underground is to be planned below the existing working of Amlo opencast. The proposed mining area of proposed Amlo underground will be vertically below within part of the existing mining area of Amlo opencast. The existing Amlo opencast is in operation up to seam-VI. An expansion PR of Amlo opencast considering the existing mining area of Amlo opencast as well as additional adjoining area of existing Amlo opencast has also been prepared for extraction up to seam-VI. The extraction of overlying seams by Amlo opencast within the proposed Amlo underground project is close to completion but there will be internal dumping in the de-coaled area. The height of existing internal dump within the proposed UG mining area is presently around 15m above the surrounding surface RL. As per the

planning of Amlo Expansion PR, additional in pit dumping is also to be done in the proposed UG mining area having final dump RL 340m. The parting between the floor of the quarry & roof of seam-V in the proposed mining area is around 28m whereas the parting between floor of the quarry and roof of seam-III is around 55m.

b) After this deliberation, it was suggested by DGMS and agreed by the team of officers that there may not be any problem in development of seams below active dumping of Amlo opencast even if the parting is low with higher pillar size considering dead load of internal dump over parting. But in case of depillaring of developed pillar, the parting between the floor of the quarry and roof of the seam to be depillared should be more than 15t (where t- thickness of extraction). If the parting thickness is less than 15t, then there may be the chances of overriding of pillars while depillaring of developed pillar. Hence depillaring of seams may not be safe.

c) In case of proposed Amlo underground, the parting between floor of quarry (i.e floor of seam-VI) and roof of seam-V is around 28m in the considered mining area. The maximum thickness of extraction is around 2.04m. The estimated safe parting as per technical guidelines suggested by DGMS for maximum thickness of extraction comes around 31m. Here the existing solid parting is less than estimated safe parting, hence there may be the chances of overriding of pillars due to dead load of OB dump over the parting and will be difficult to control the roof while depillaring in seam-V. Hence, practically depillaring in seam-V may not be safe.

d) The quality of coal of seam-V varies from G-10 to G-12 and estimated extractable reserve for seam-V is around 1.20 M.te. Considering the quantity of extractable reserve of seam-V, difficulties in depillaring of seam-V, its inferior grade of coal & safety of the mine, the depillaring of seam-V may be avoided by the company and extraction of only seam-III may be considered by the company for safe mining.

e) The parting between seam-III and floor of seam-VI (i.e quarry floor) comes around 55m within the mining area. The proposed maximum thickness of extraction for seam-III is around 2.50m. The estimated safe parting as per technical guidelines suggested by DGMS (i.e 15t) comes to around 38m. Here the actual parting between floor of quarry & roof of the seam is more than the estimated safe parting, hence there may not be chances of overriding of pillars while depillaring in seam-III.

f) It was further suggested by the DGMS that the above sated safe parting (i.e 15t) is applicable for overlying virgin strata but in this situation the overlying strata is loose internal dump. Hence, a scientific study should be done for the estimation of impacts of dead load of internal dump over the parting between roof of seam-III & floor of seam-VI (i.e floor of the quarry).

g) It was also suggested by DGMS that there may be chances of slope failure of dump due to subsidence in underlying seam-III. Hence a scientific study should be done for the estimation of impact of subsidence on stability of dump slope on depillaring of seam-III below internal dump area.

Additional Annexure-19

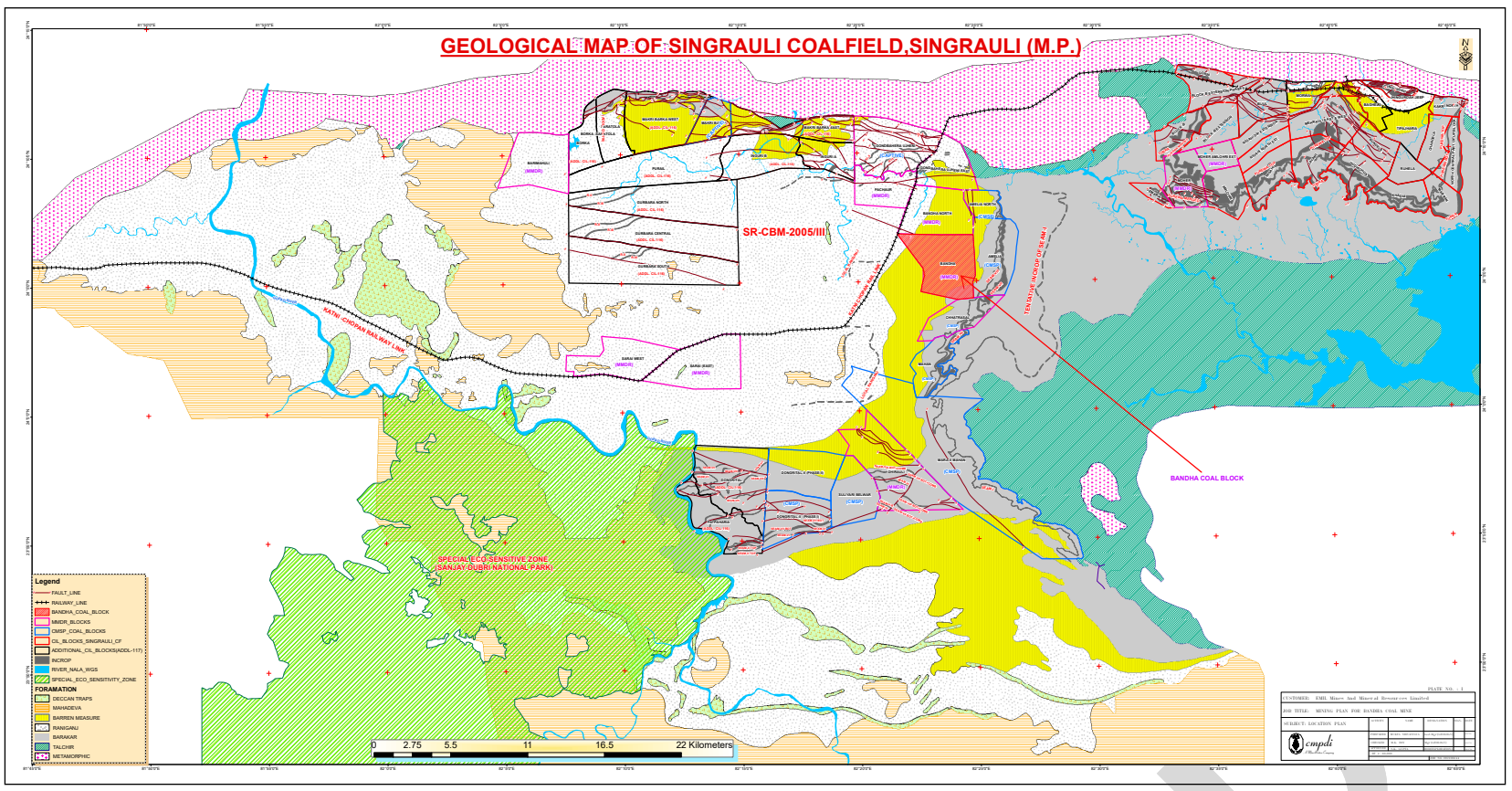
ANNEXURE-XIX

Compliance of the Recommendation given by Internal Committee of MoC

Sl.	Recommendations	Compliance Details
1	Time frame for further exploration/ study shall be finalized. (refer para 2.2.8). Year-wise future program of exploration to be finalized (refer para 2.2.9). The location of the proposed boreholes shall be marked on the Geological Plan.	Drilling program has been given and location of proposed bore well has been marked on geological plan and given as Plate No.-XXIV.
2	After completion of the proposed exploration, the project proponent shall submit for approval a Revised Mining Plan and Mine Closure Pan incorporating the details (as per Guidelines of MoC for preparation of Mining Plan dated 29.05.2020) of liquidation programme of seams from underground mining also.	It has been mentioned in the mining chapter that after completion of proposed exploration drilling, a Revised Mining Plan and Mine Closure Plan incorporating the details of liquidation program of coal seams to be considered in UG mine method will be submitted.
3	Surface features, village outline, outline of land outside the project area, railway line, railway siding etc. shown outside the Geological Block/ Project area shall not be part the Mining Plan and shall be removed from the plans.	Surface features and village outside the block has been removed from the Plan.
4	Para 8.1 of the Guidelines of MoC for preparation of Mining Plan shall be referred to for determining Year 1.	Determination of Year 1 has been done according the suggestion and accordingly all necessary changes has been done.
5	It was informed by the project proponent,during presentation, that DGMS has certain guiding principles regarding simultaneous working in underground with respect to overlying opencast working. Any instructions available in this regard shall be enclosed as annexure. Project Proponent will undertake to adhere to these guidelines / instructions.	Minutes of Meeting with DGMS regarding depillaring below active dumping has been annexued as Annexure-XVIII.
6	Calendar for peak production (Annexure XIII) may not be part of Mining Plan and shall be removed from the Mining Plan.	Peak Production Colander Program has been removed from Mining Plan.
7	R&R shall be done as per existing laws	Complied.

Plan/Plates

Plate 1



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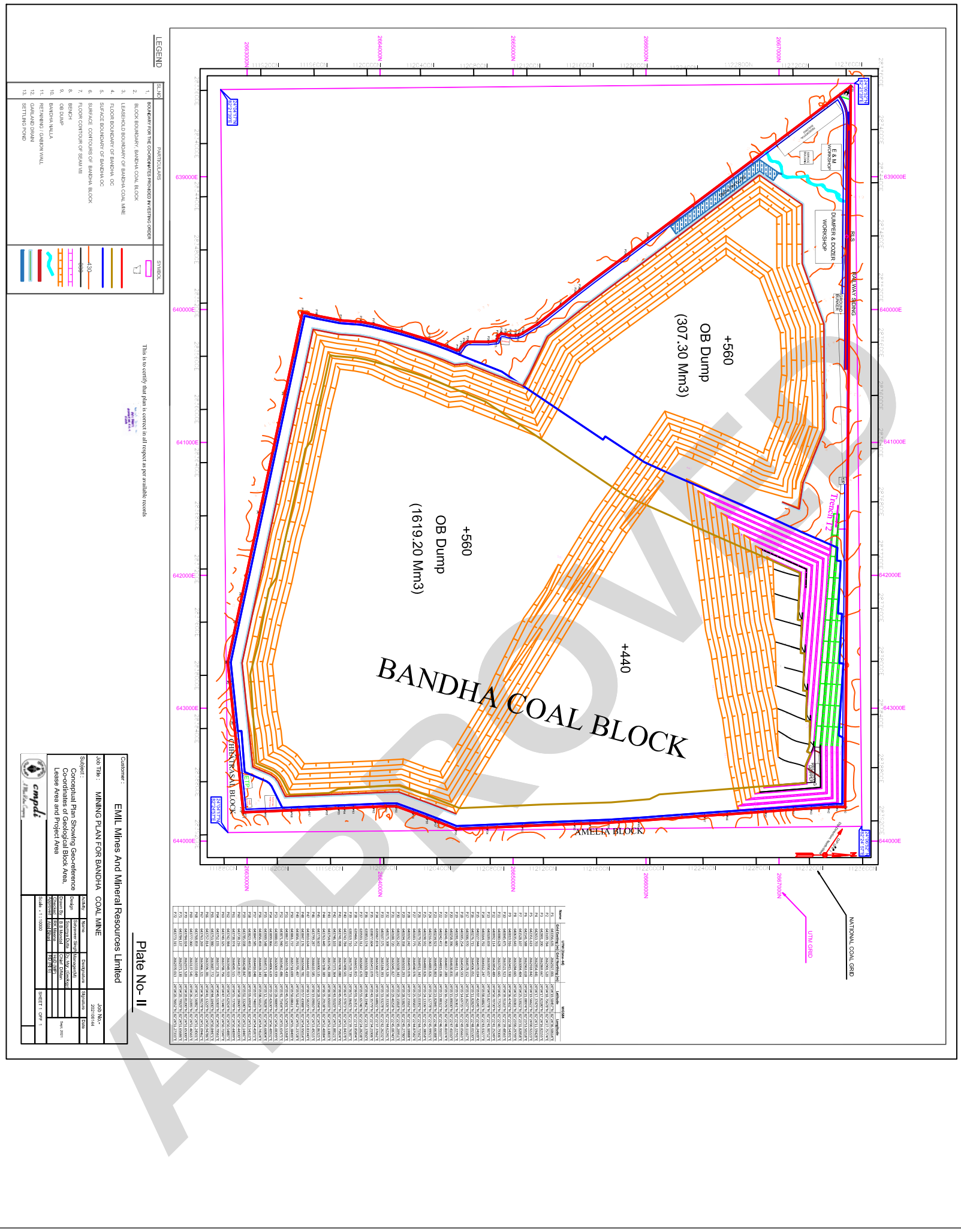
Plan / Plate 2A



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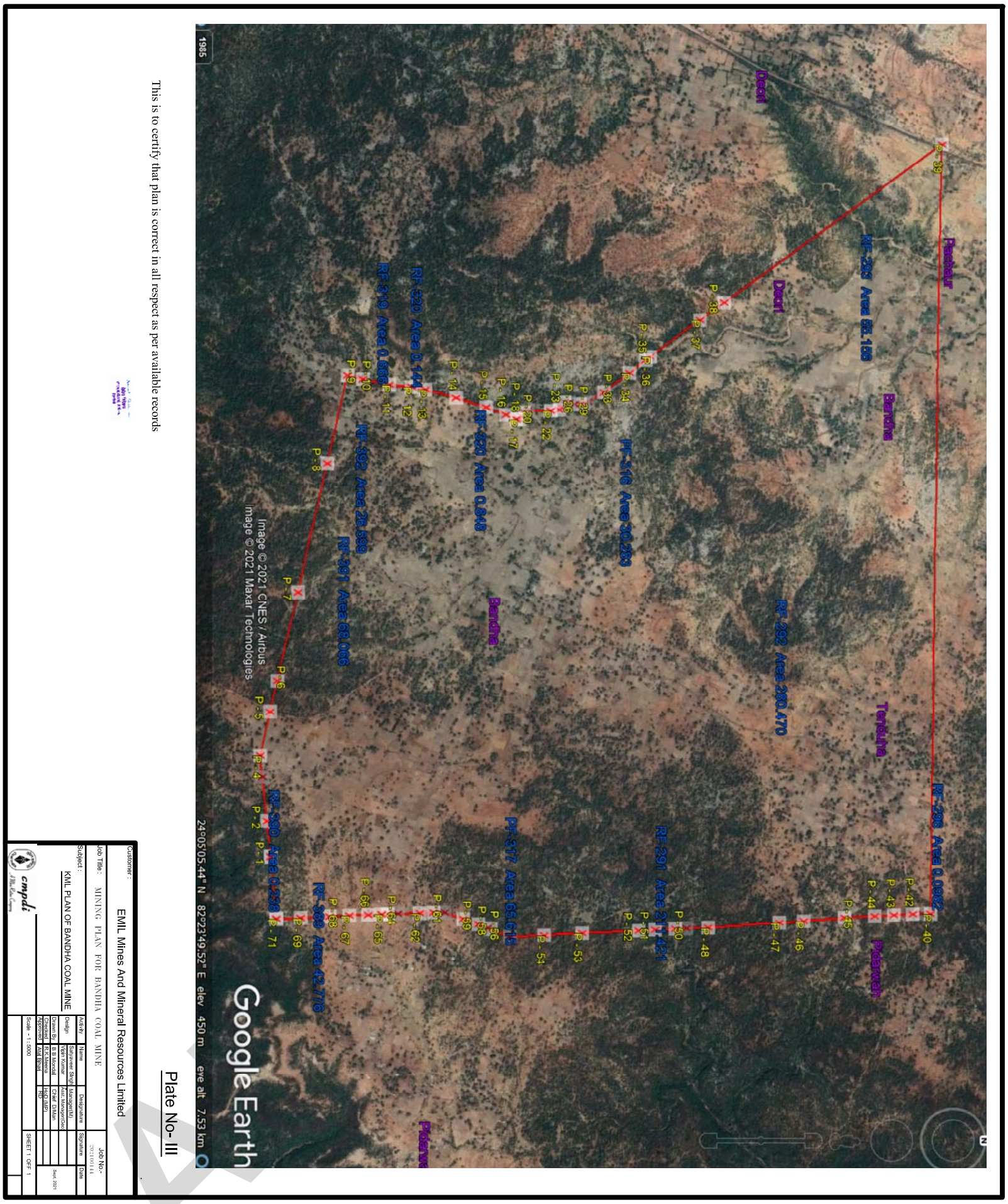
Plan / Plate 3A (Lease Area)



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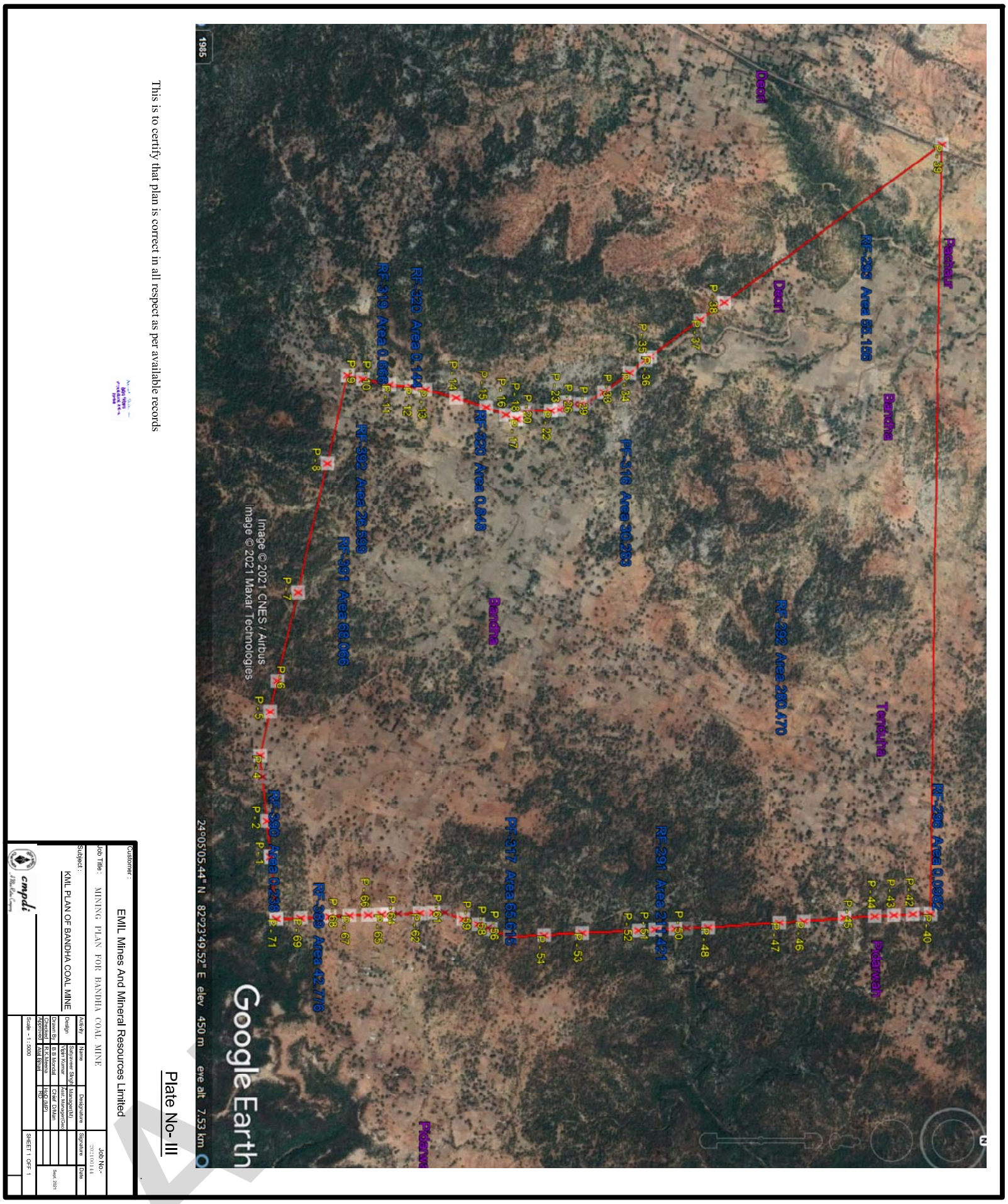
Plan / Plate 3B (Project Area))



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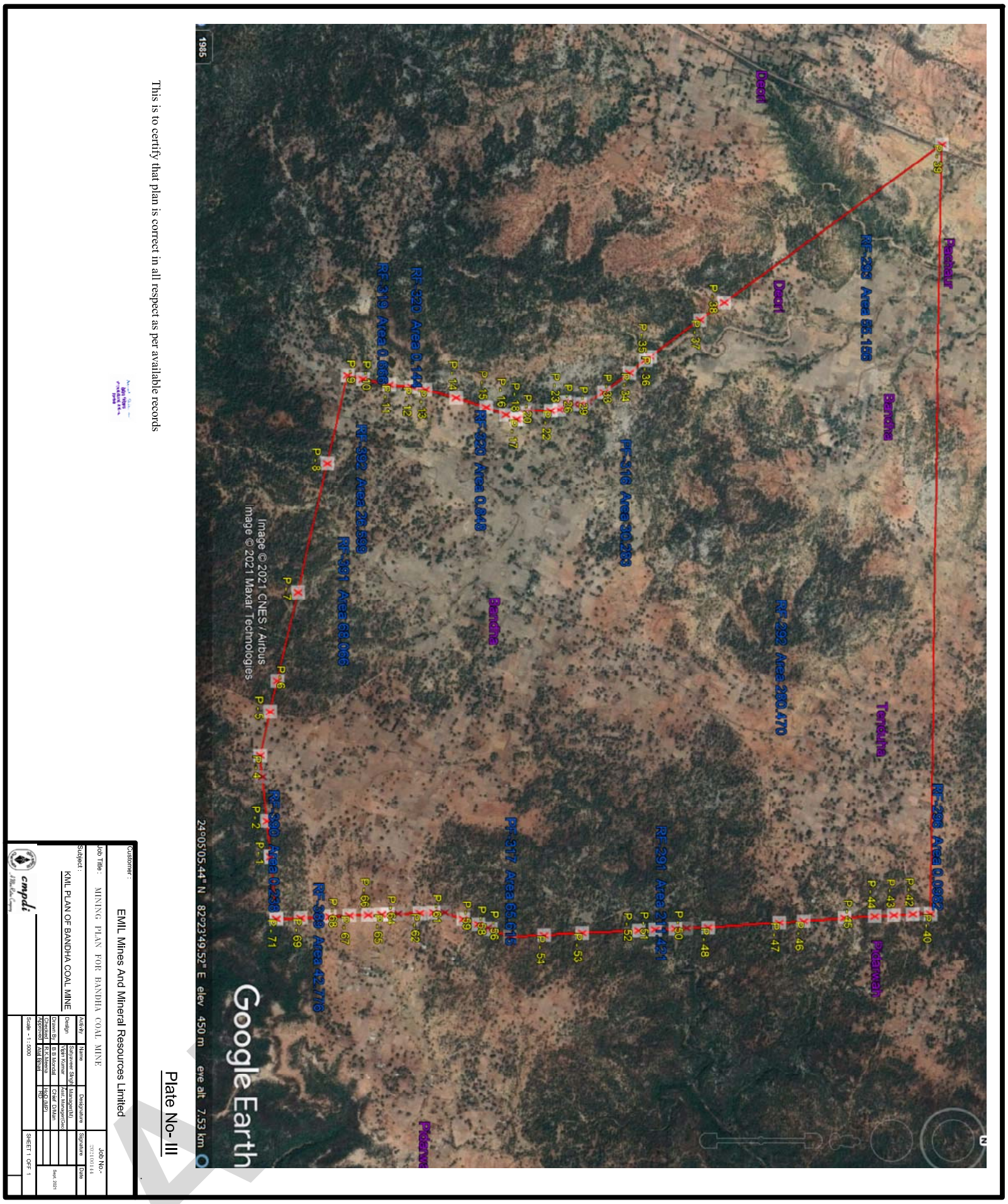
Plan / Plate 3C (Geological Block))



This is to certify that plan is correct in all respect as per available records

Plate No- III

Customer :	EMIL Mines And Mineral Resources Limited			
Job Title :	MINING PLAN FOR BANDHA COAL MINE			
Subject :	KML PLAN OF BANDHA COAL MINE	Activity	Name	Designation
		Design	Satyaveer Singh	Manager(MA)
			Vipin Kumar	Asst. Manager(Geo)
		Drawn By	B.B.Mondal	Chief DiMan
		Checked	R.K.Meena	HoD (MP)
		Approved	Atal Bihari	HoD (M)
		Scale - 1: 5000		
		SHEET 1 OFF 1		

Job No.- 20211001144

Sept, 2021

cmpdi

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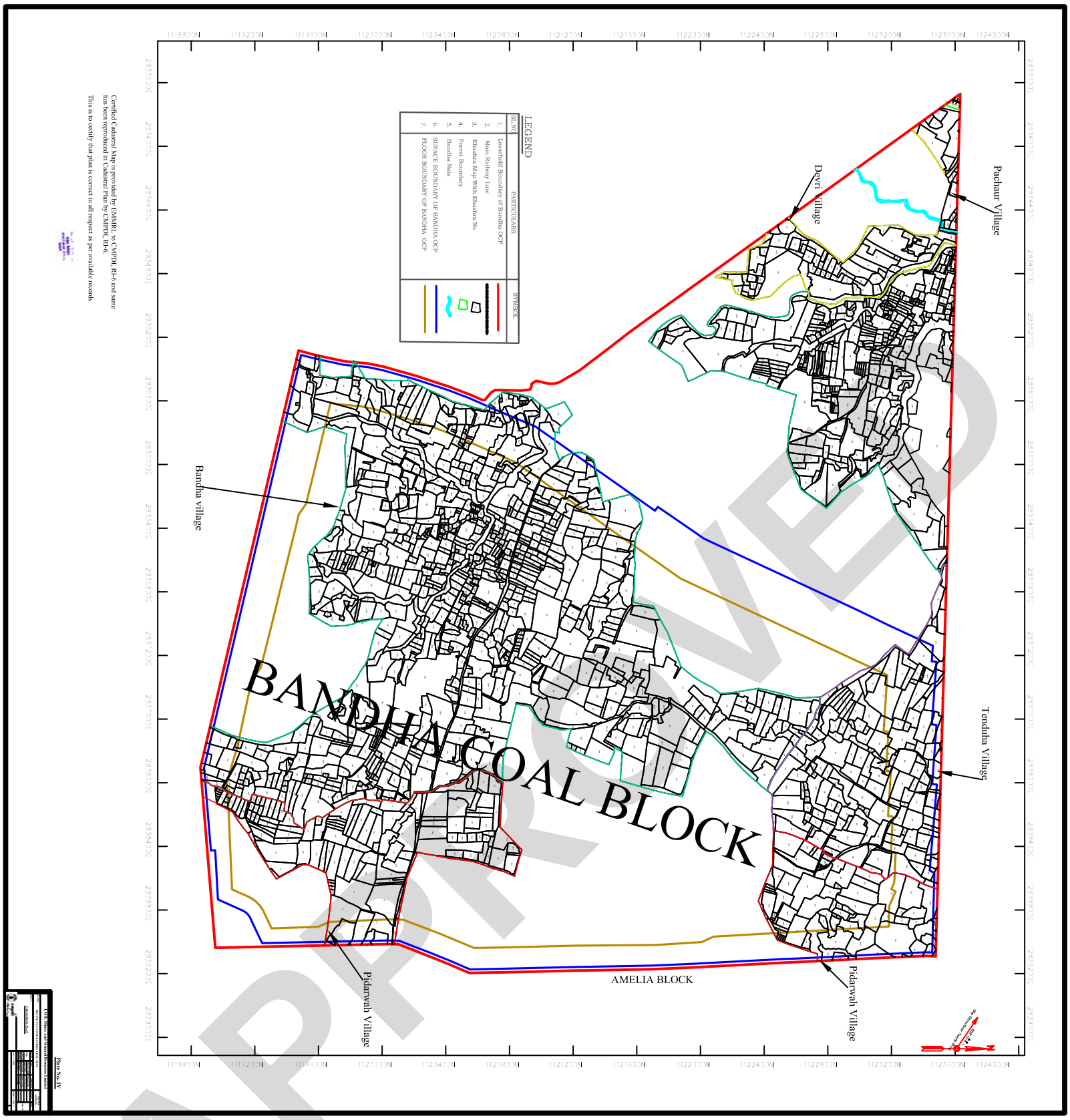
Plan / Plate 4



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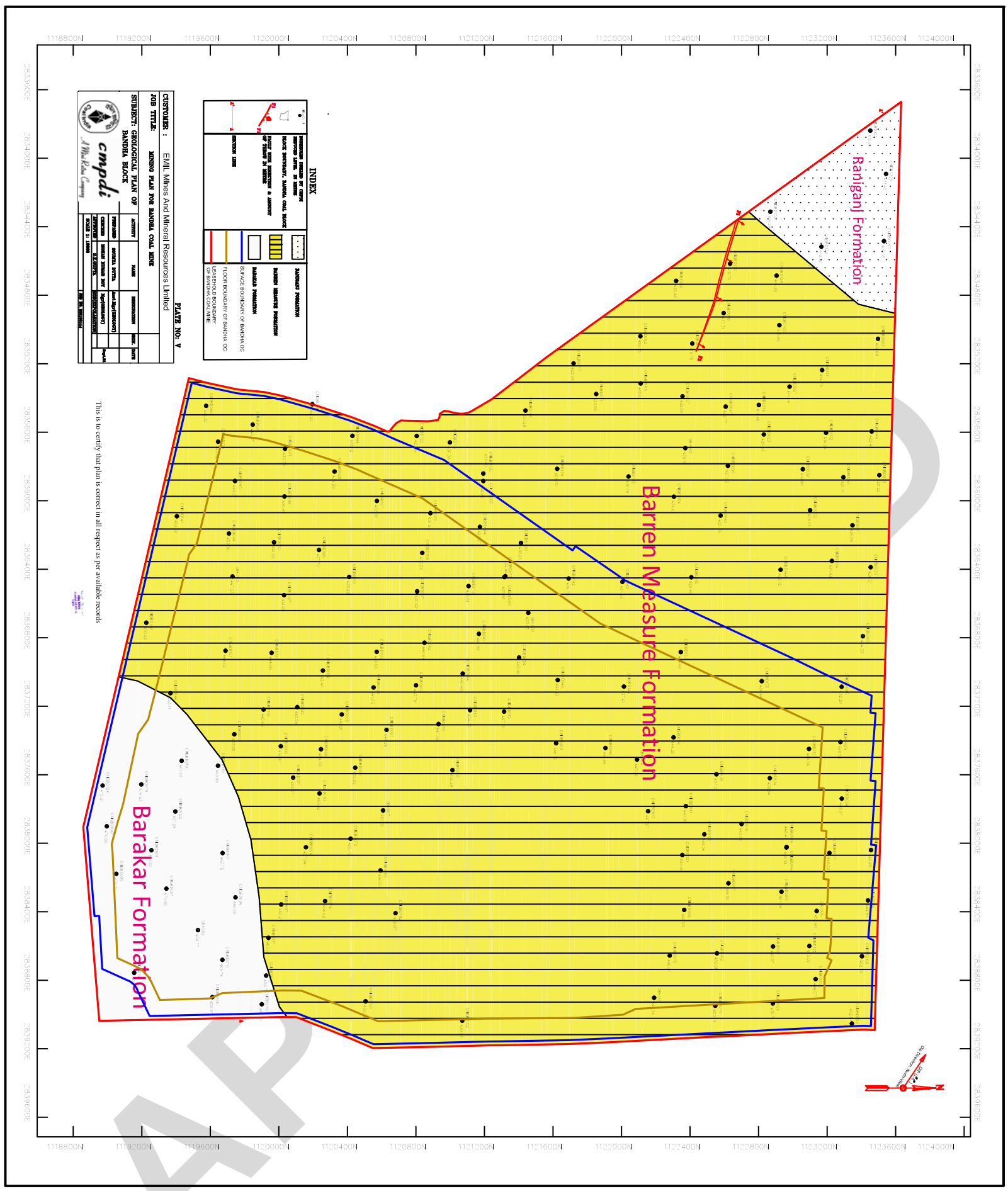
Plan / Plate 5A1



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Plan / Plate 6A1

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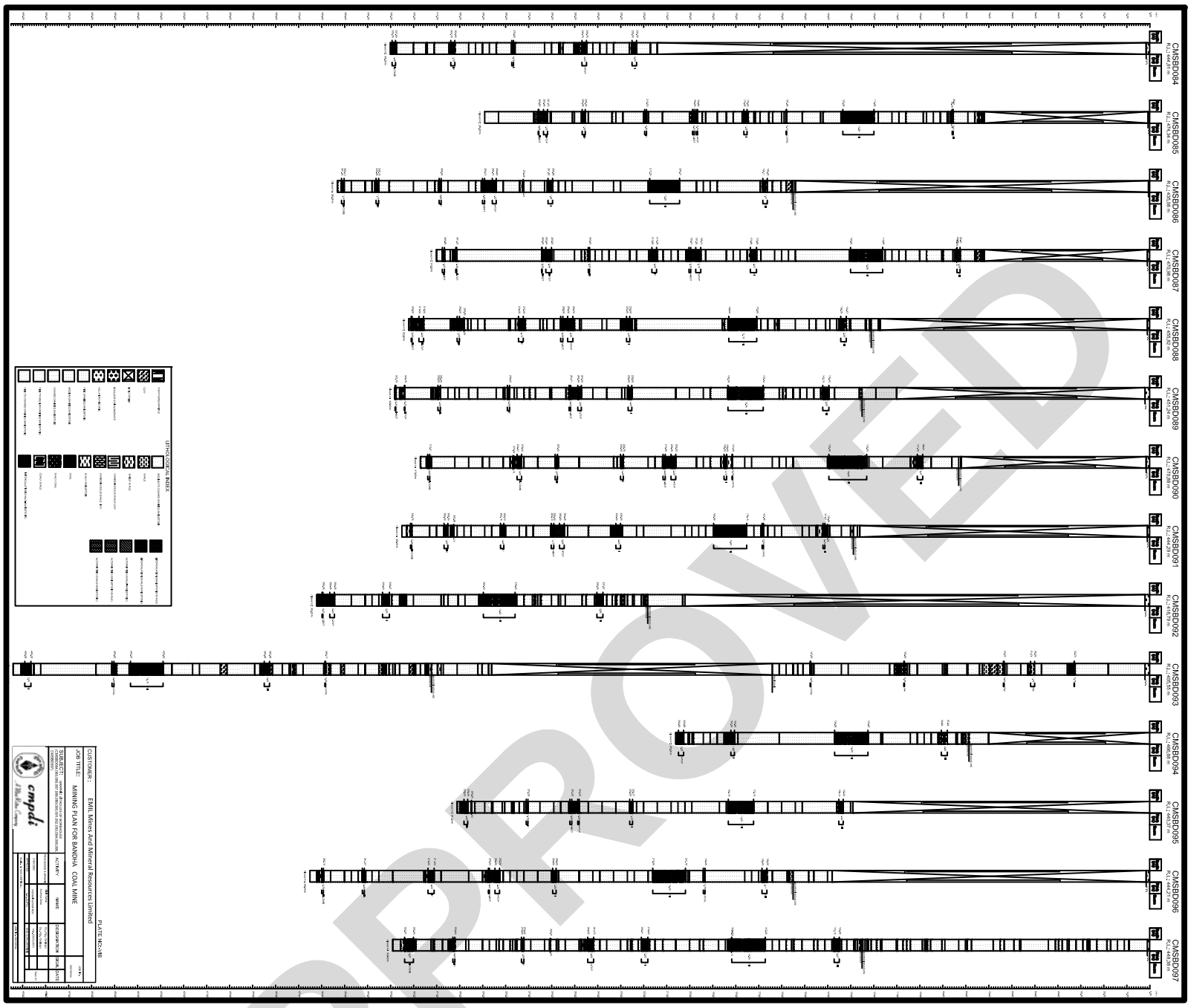
Plan / Plate 6A2



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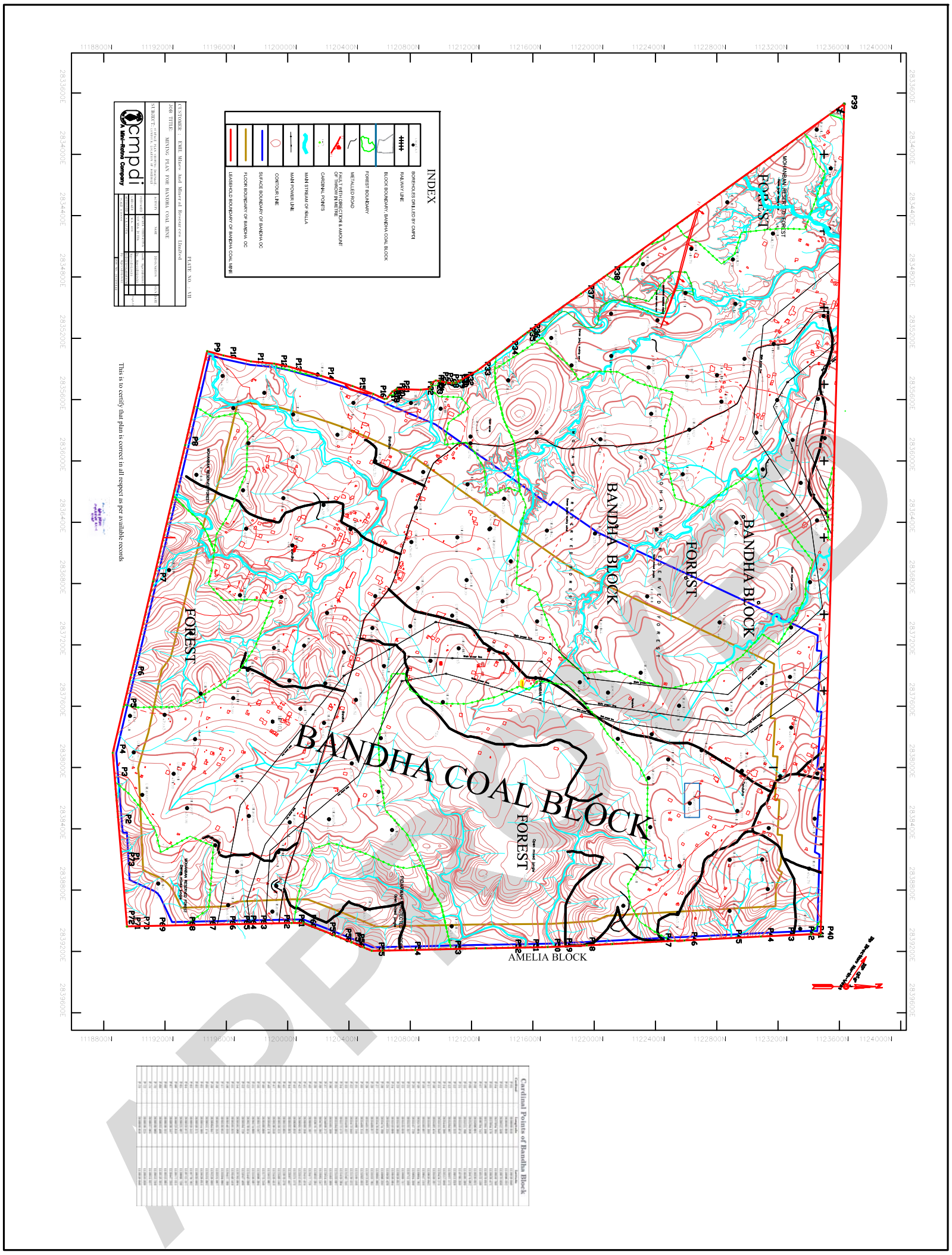
Plan / Plate 7



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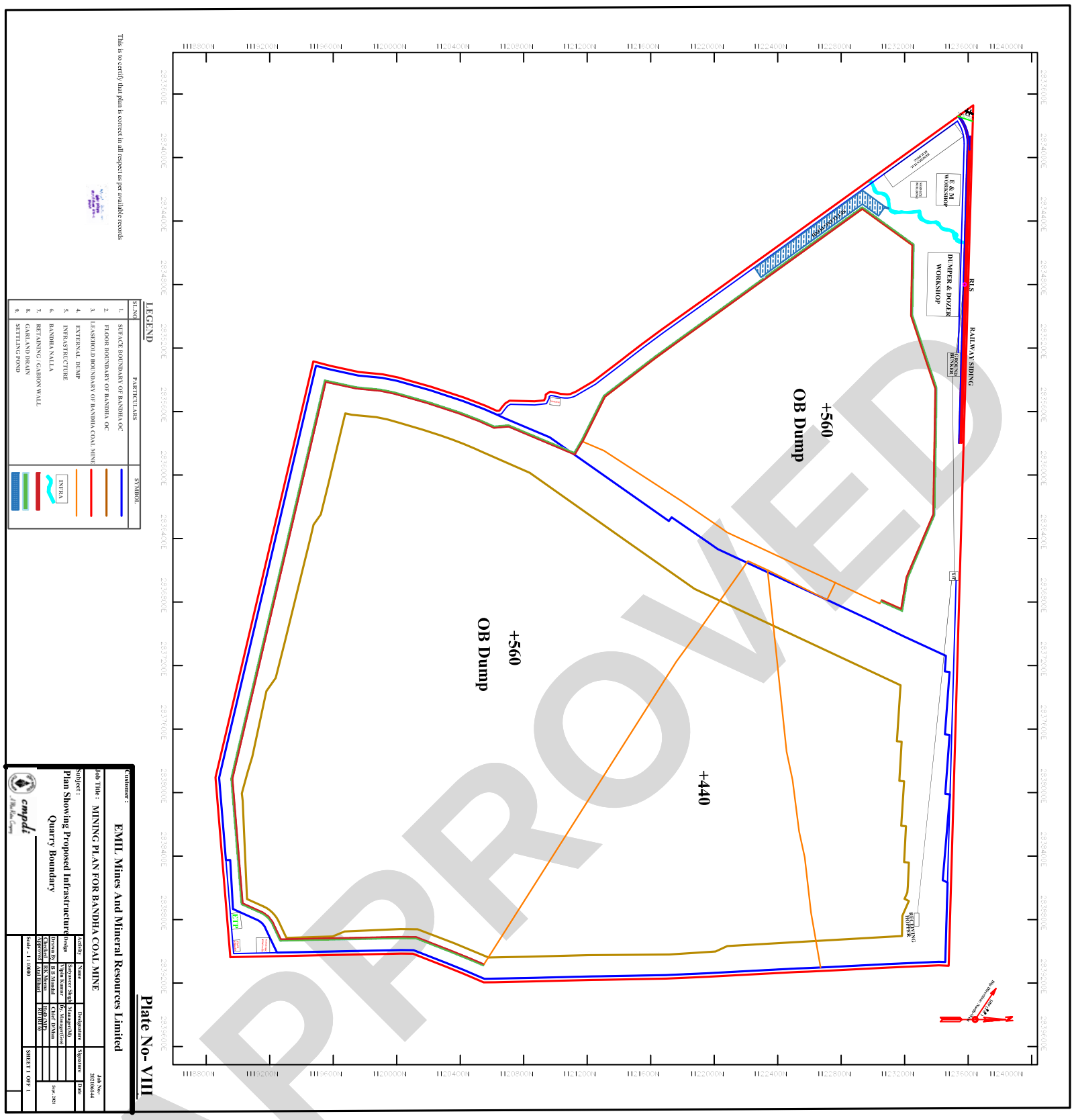
Plan / Plate 8



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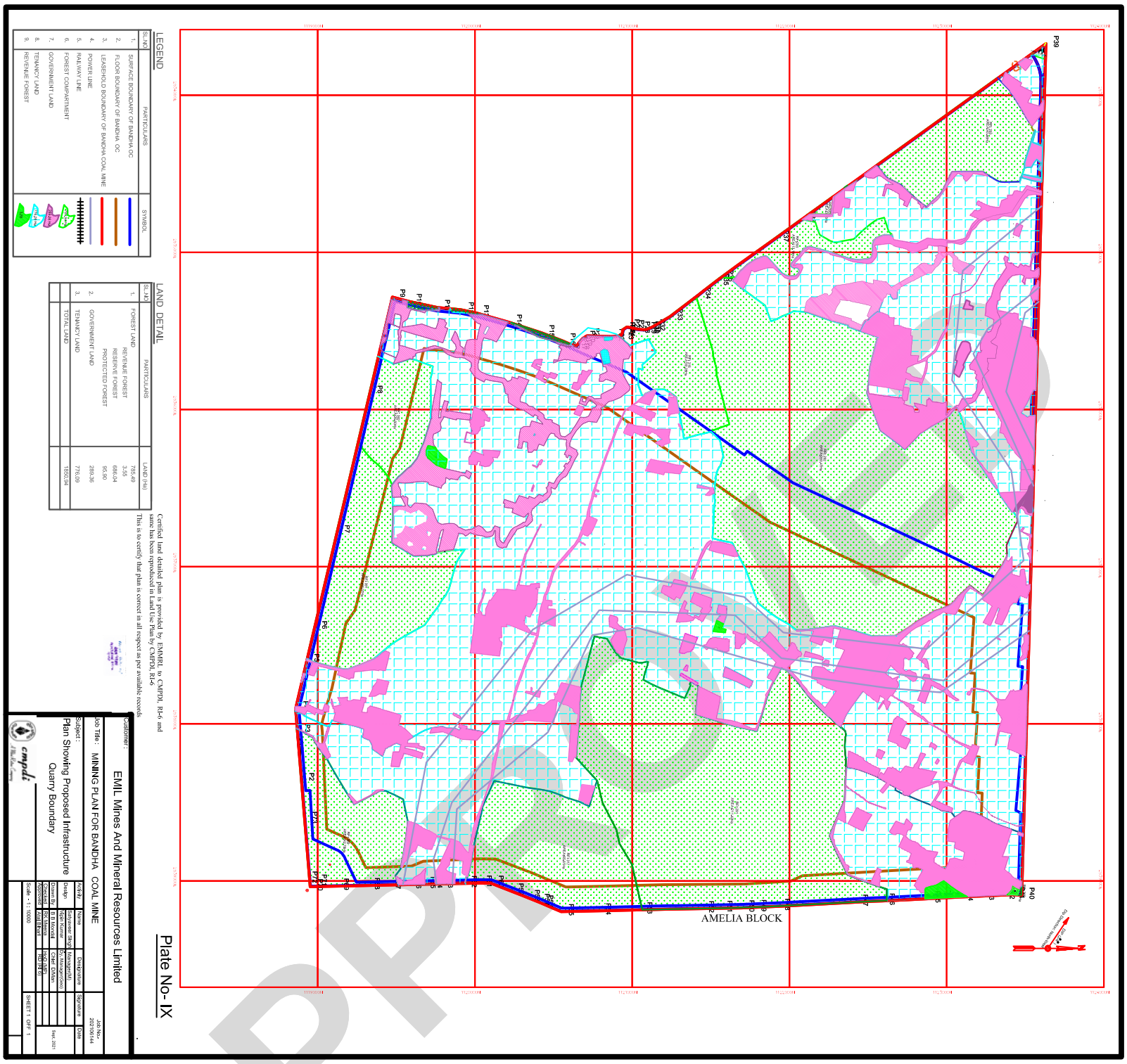
Plan / Plate 9



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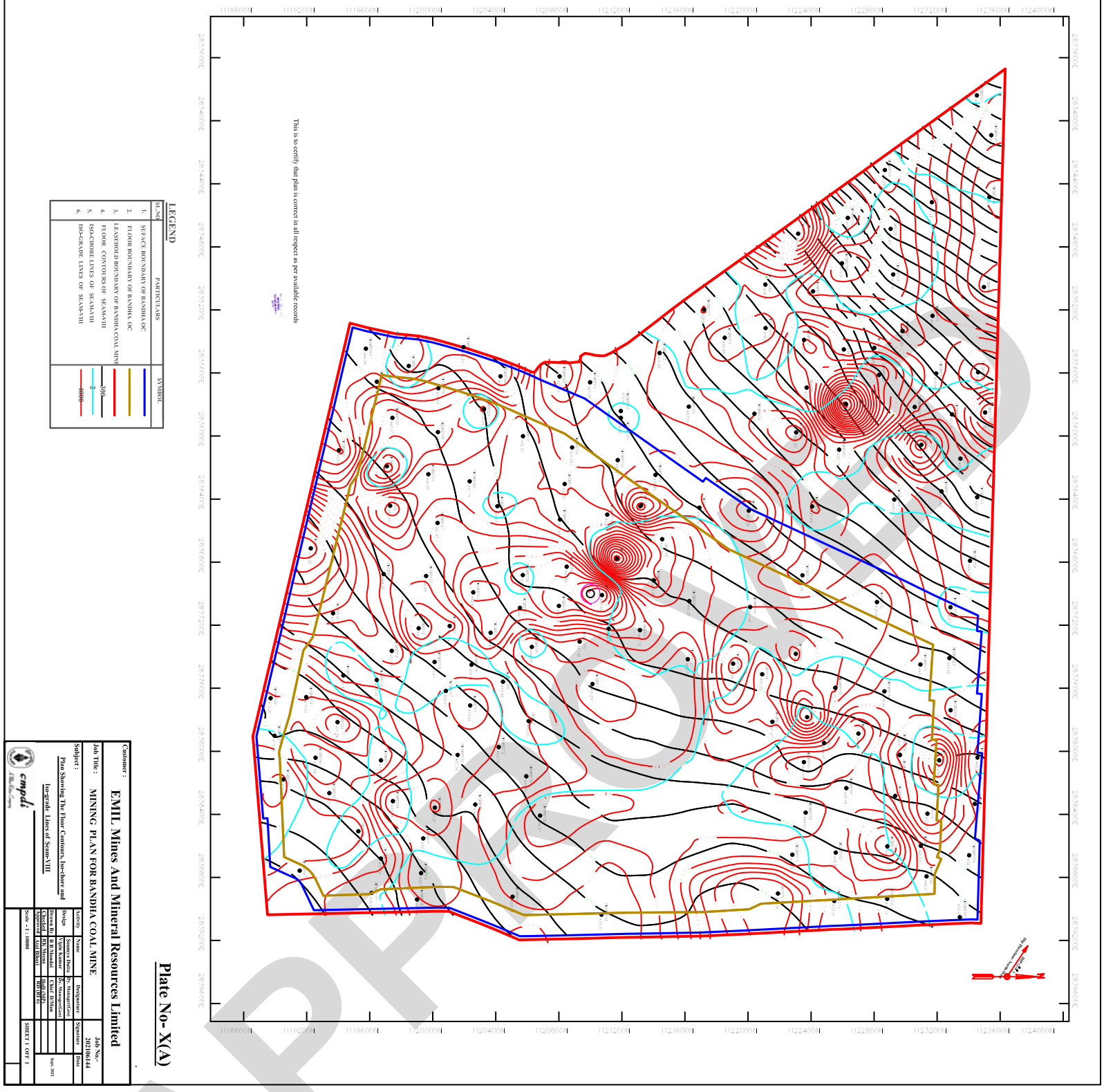
Plan / Plate 10A1



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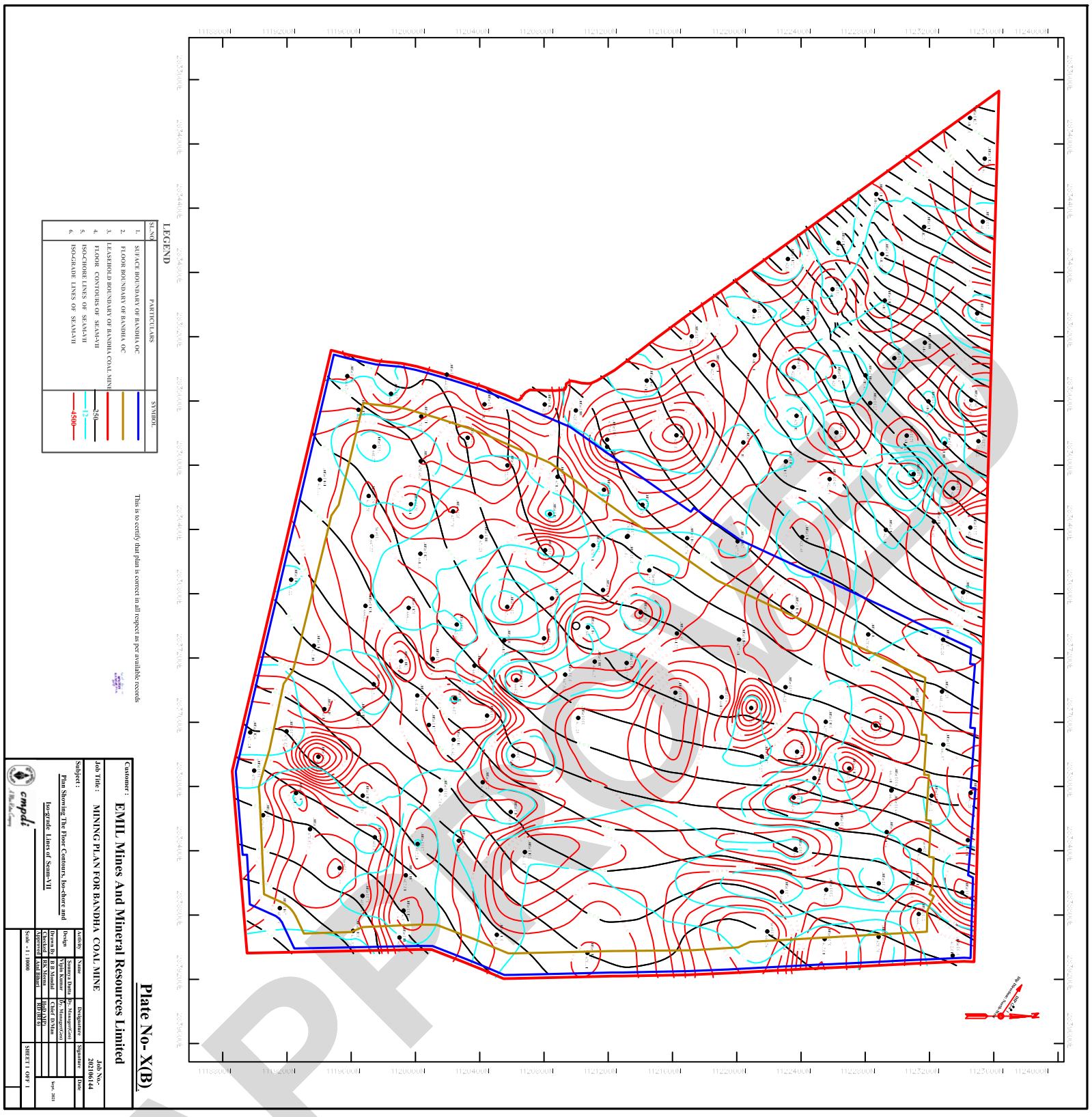
Plan / Plate 10B1



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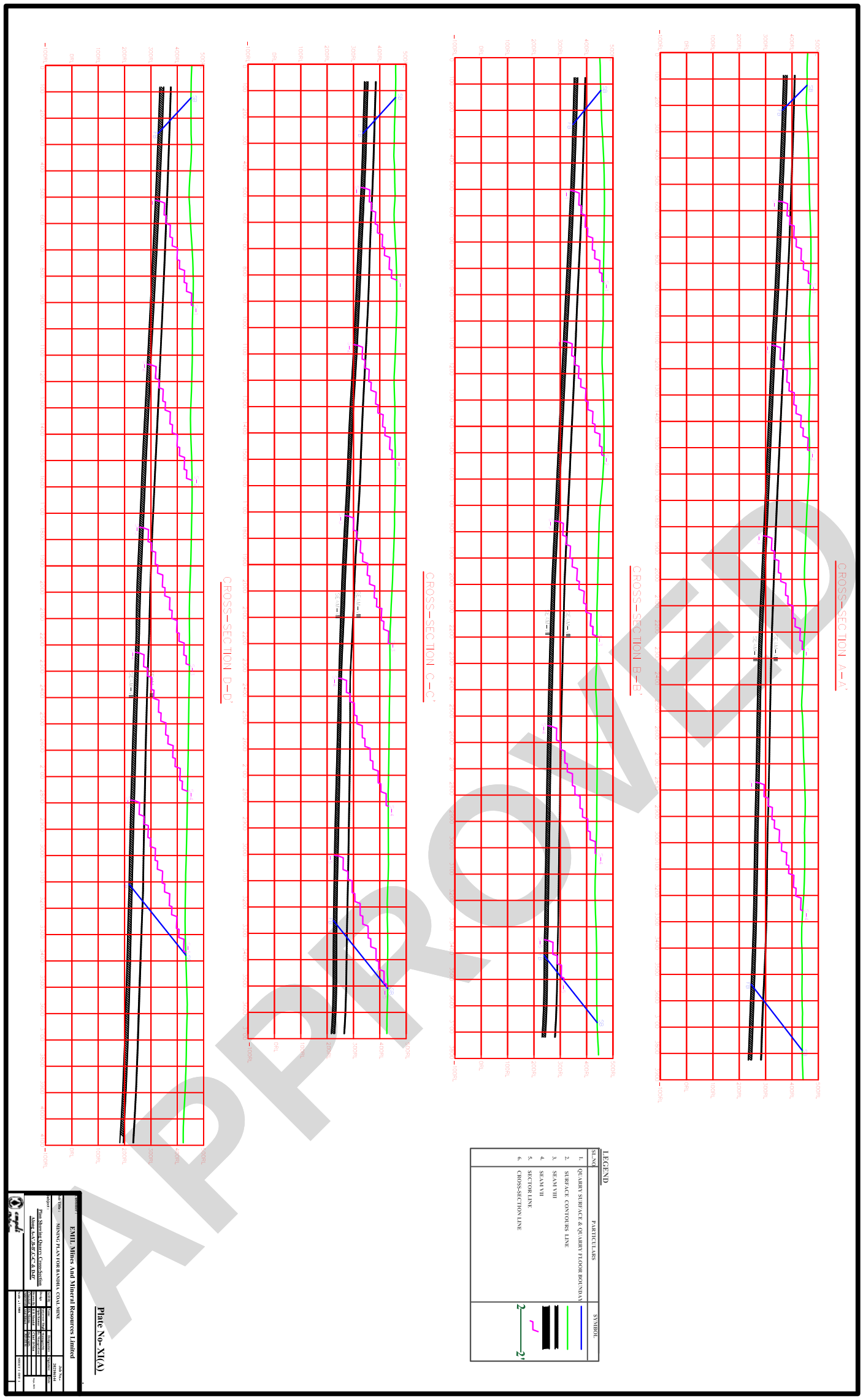
Plan / Plate 11A1



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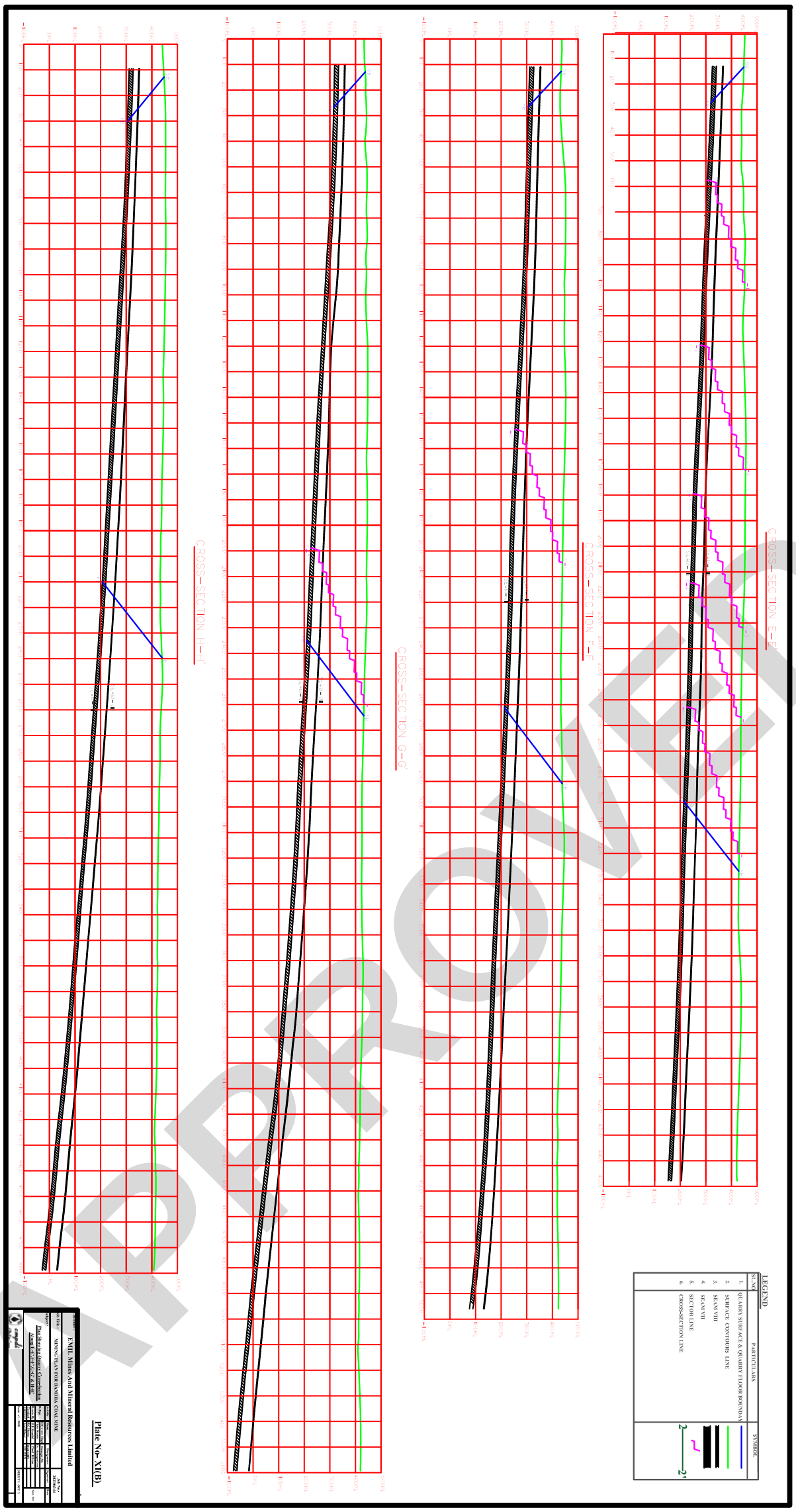
Plan / Plate 11A2



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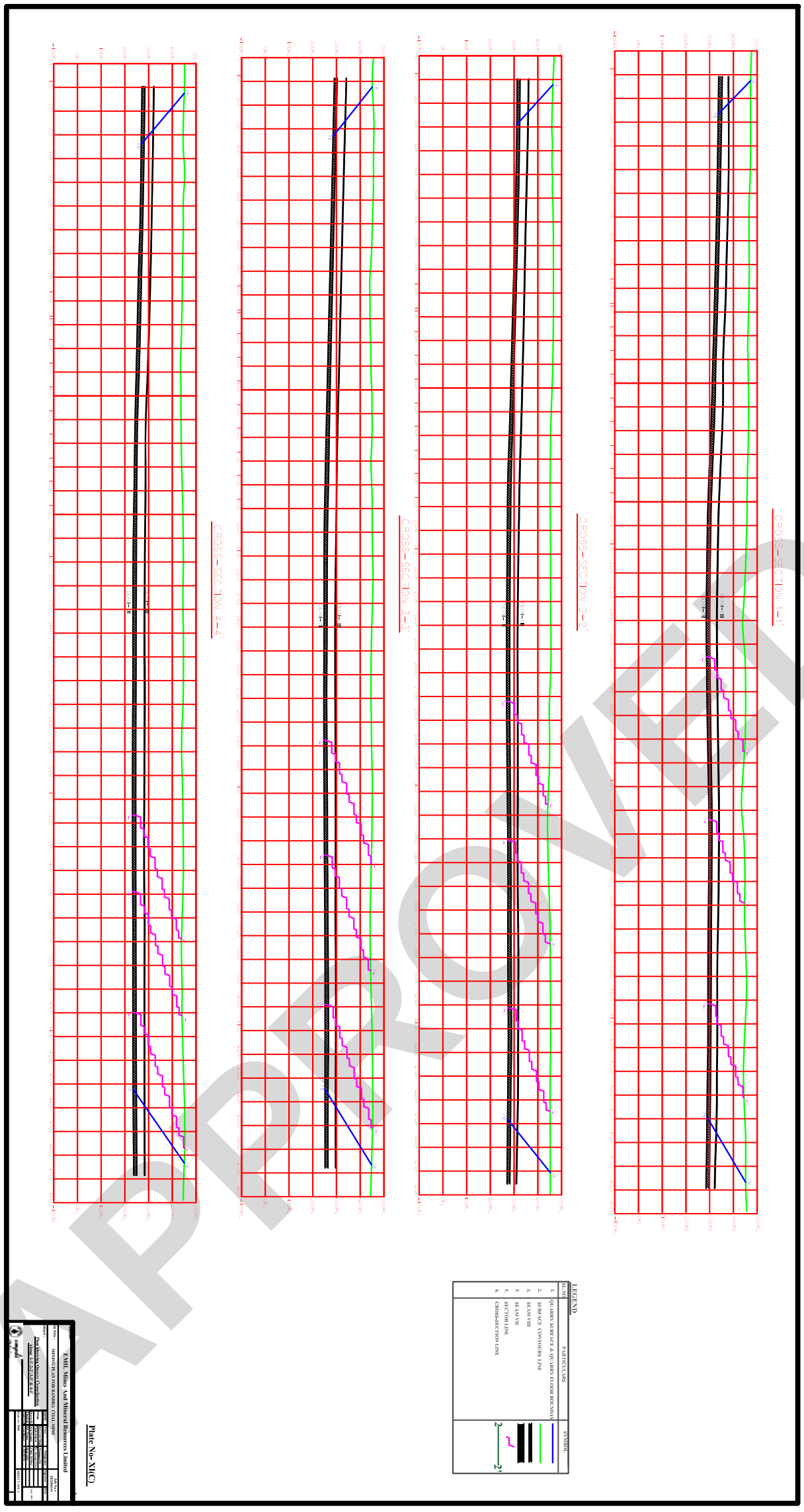
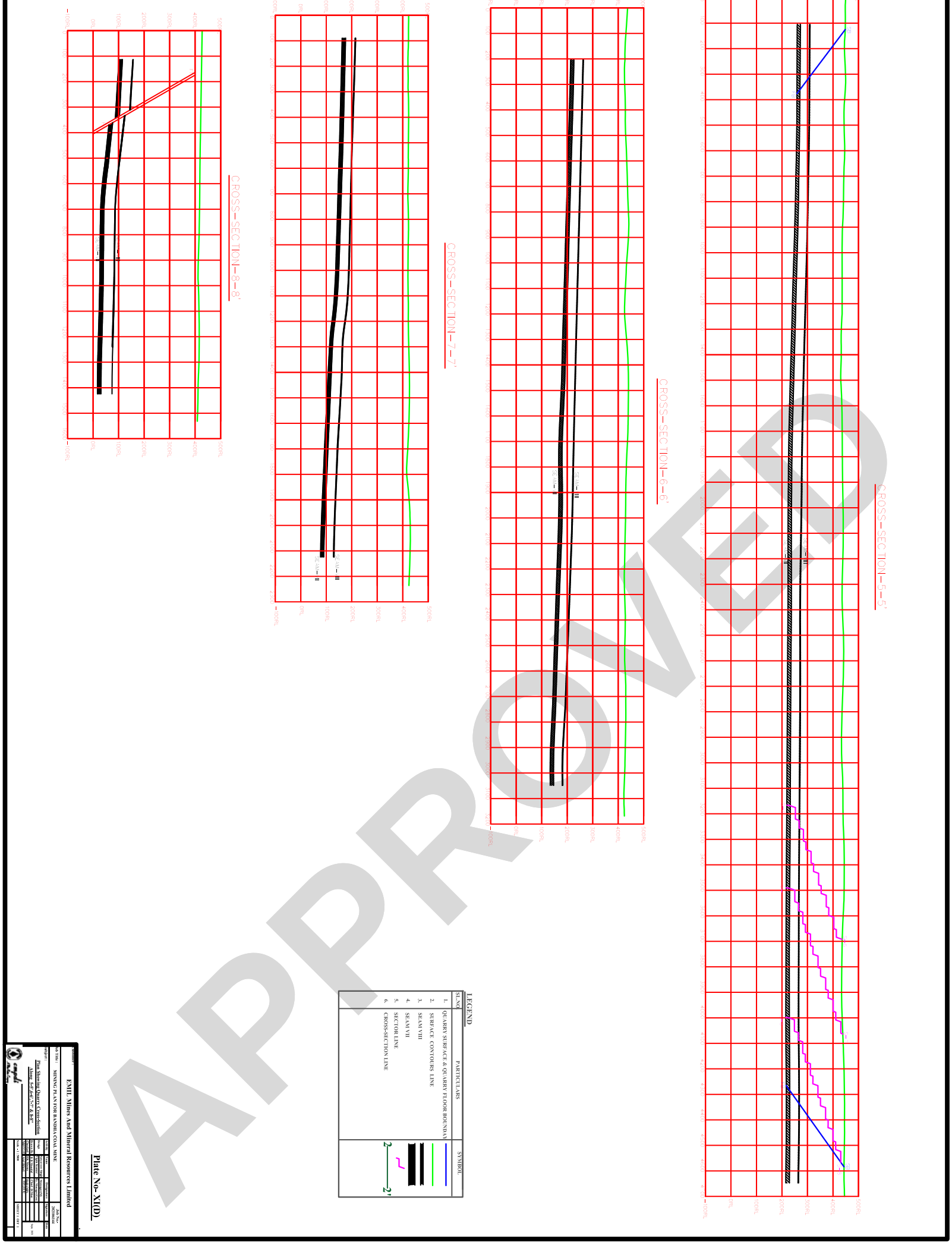
Plan / Plate 11A3



Plan / Plate 11A4



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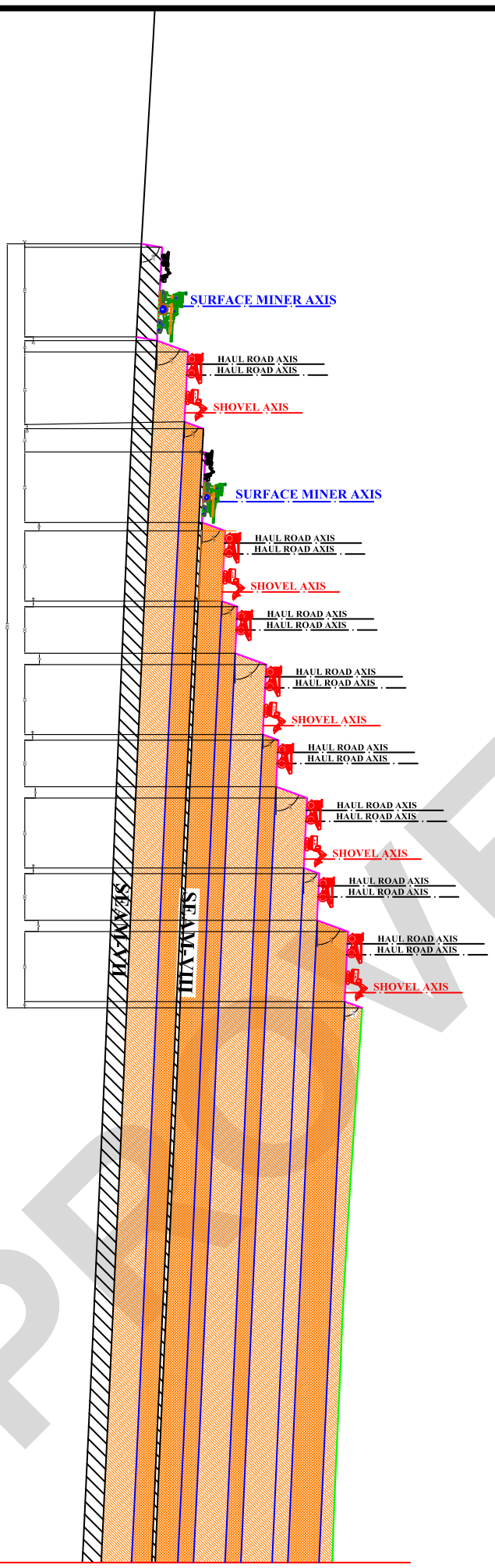
Plan / Plate 11A5



ELEMENTS OF MINING SYSTEM

Plate No.- XI (E)

Customer : EMIL Mines And Mineral Resources Limited

Job Title : MINING PLAN FOR BANDHA COAL MINE — **Job No.-** 202106144

Subject : ELEMENTS OF MINING SYSTEM

Activity	Name	Designature	Signature	Date
Design	Satyaveer Singh	Manager(M)		Sept. 2021
Drawn By:	B B Mondal	Chief D/Man		
Checked	RK Meena	HoD (MP)		
Approved	Atal Bihari	HOD (RO 6)		

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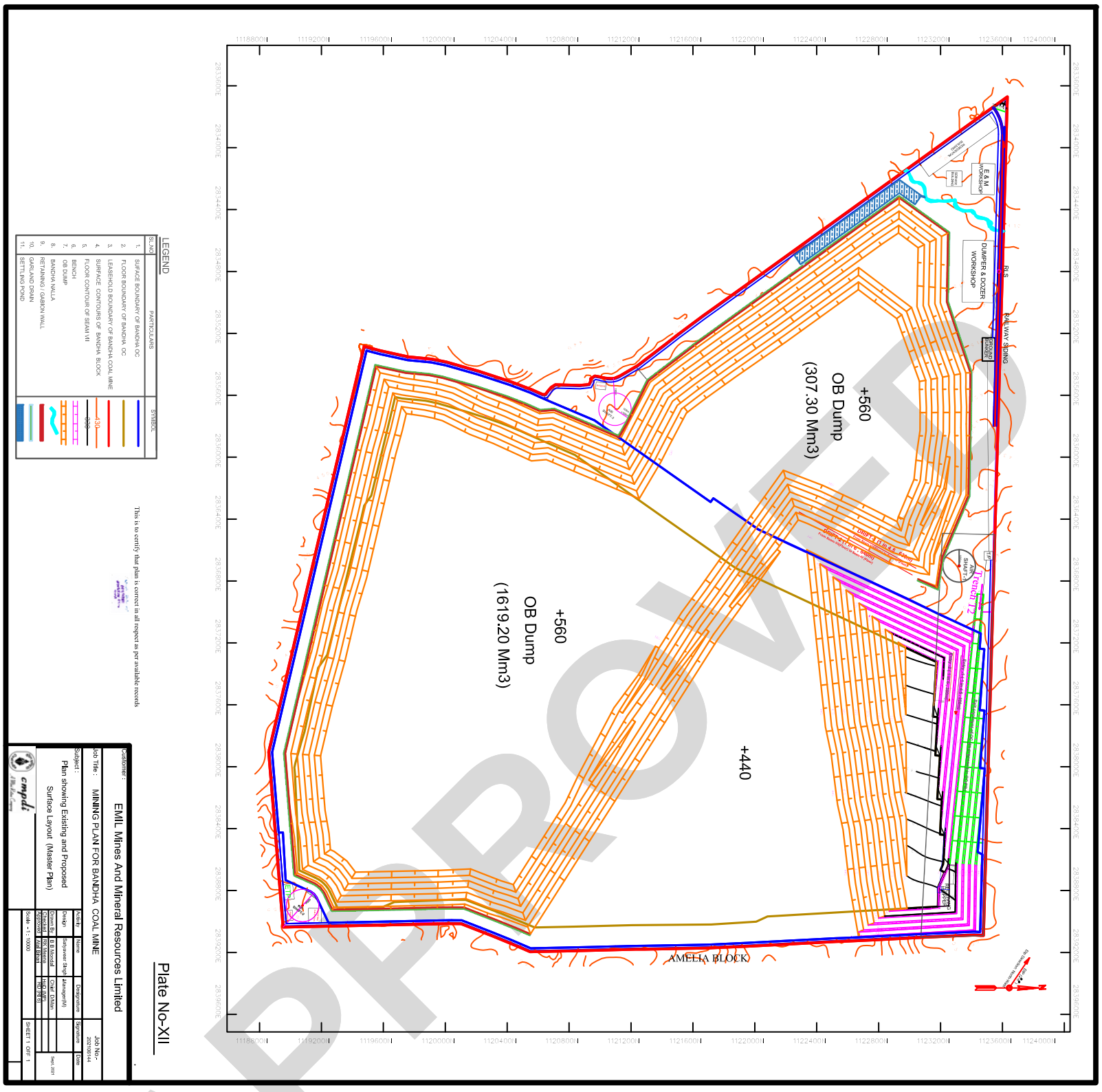
cmpdi — A Miniratna Company

Plan / Plate 12



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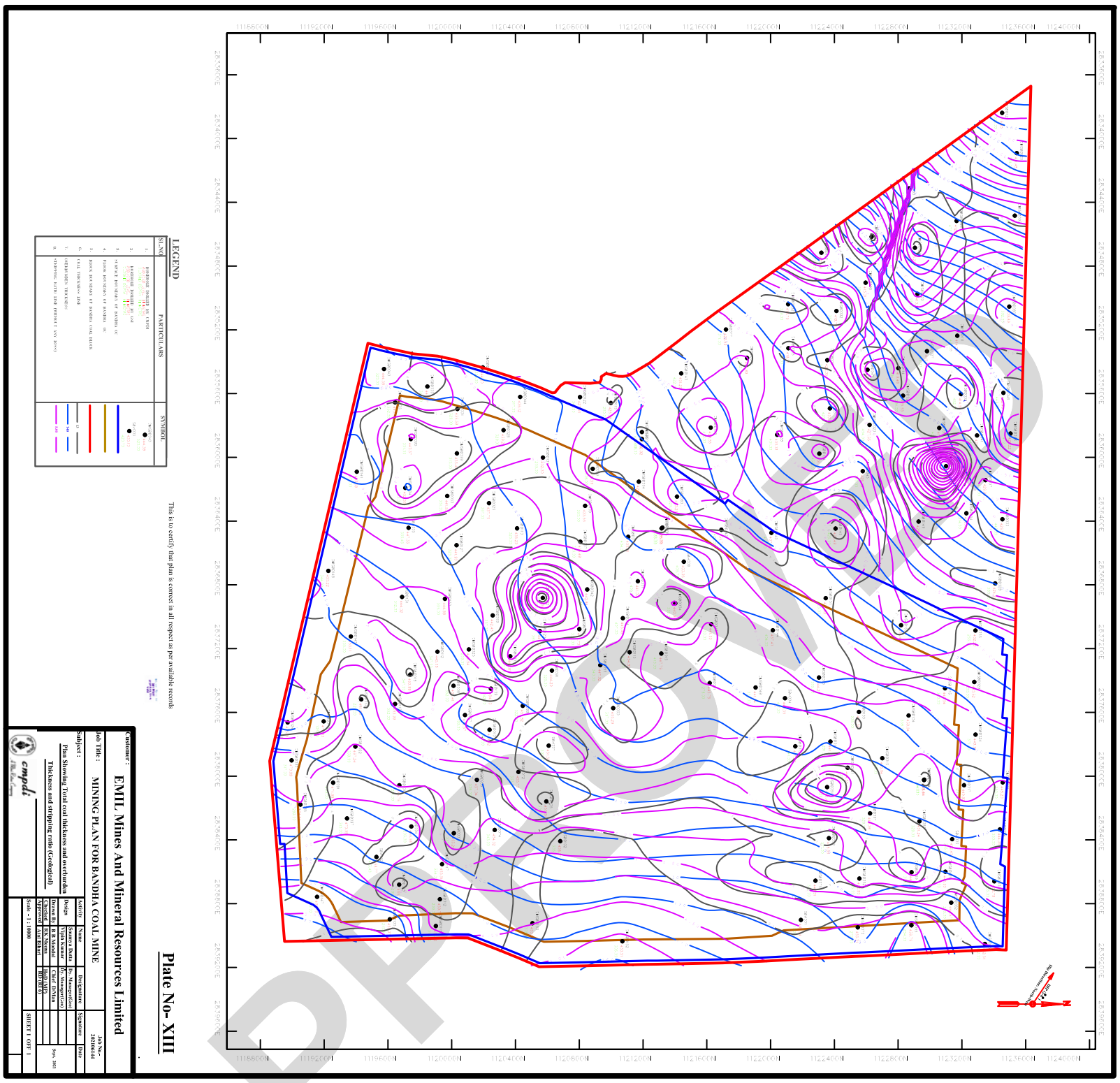
OC Plate-13



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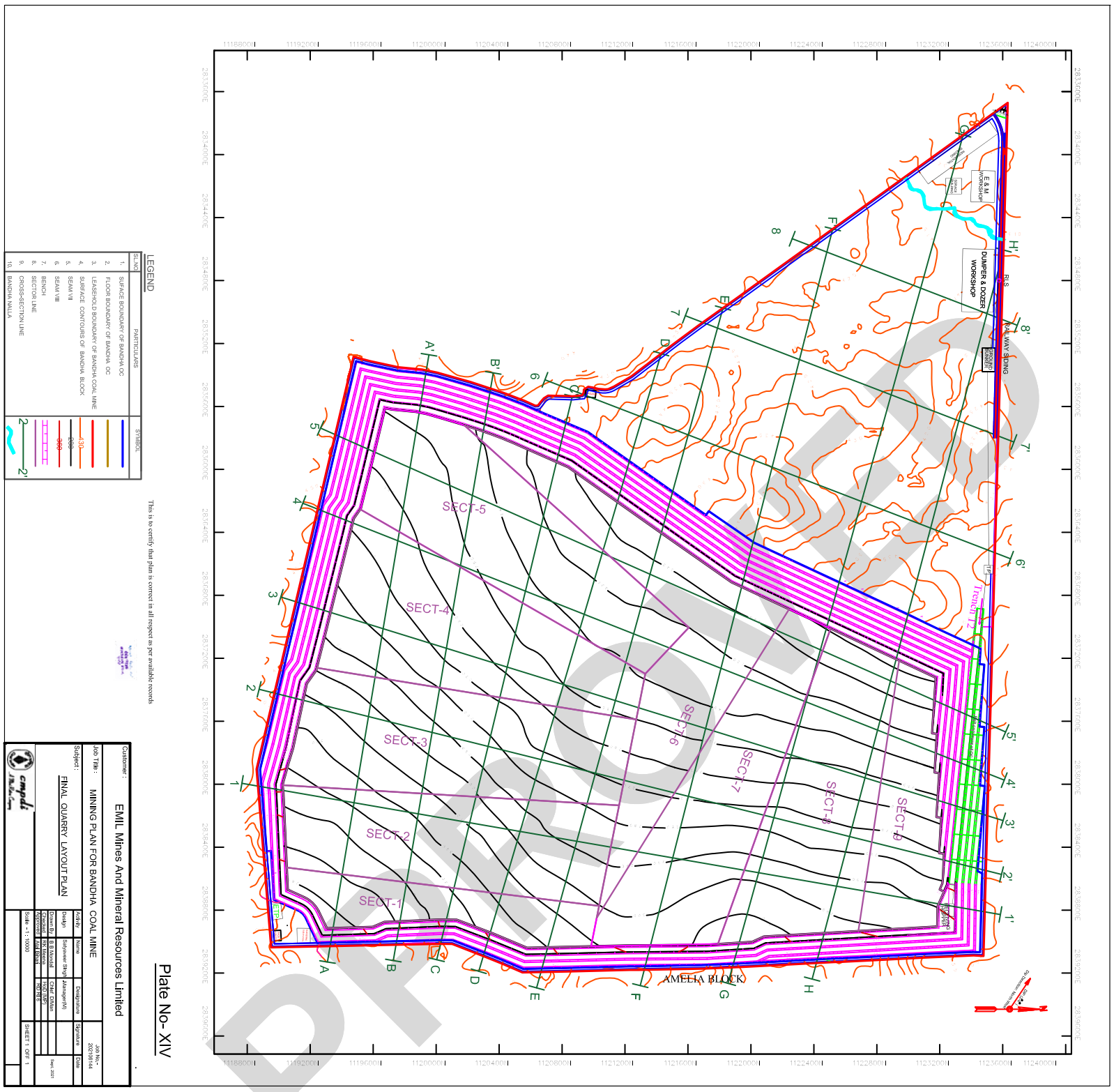
OC Plate-14



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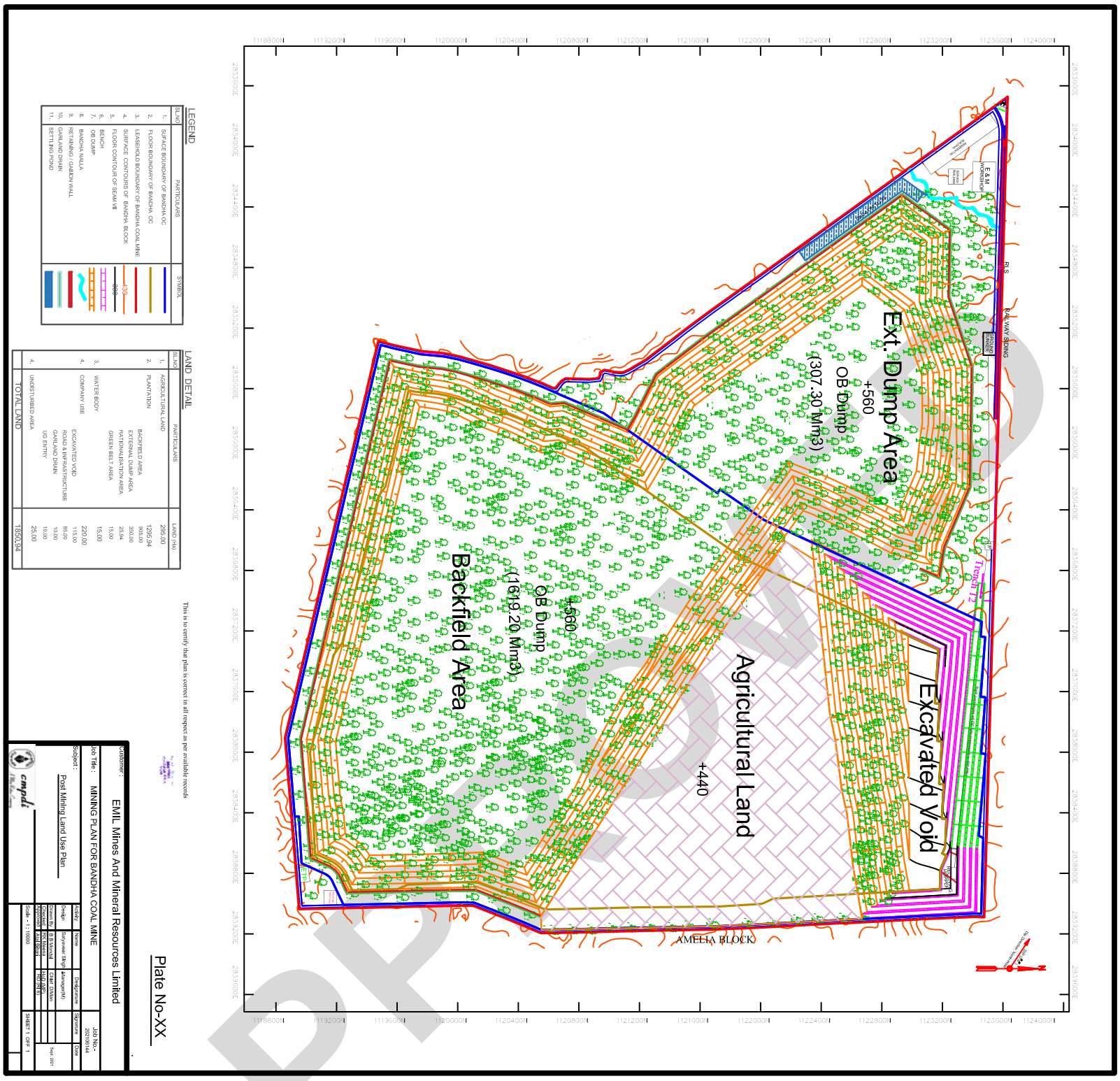
Plan / Plate 20



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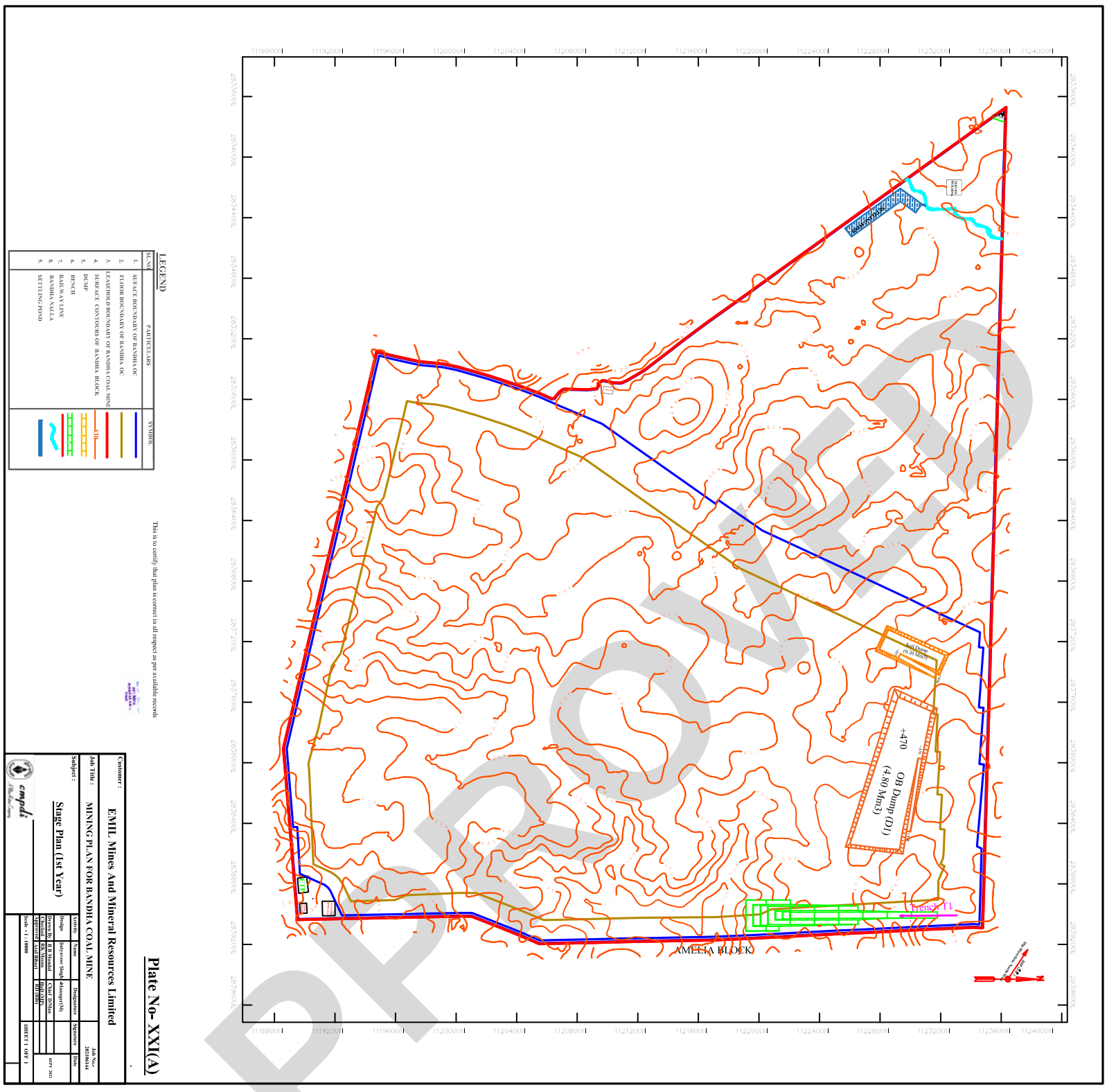
Plan / Plate 21A



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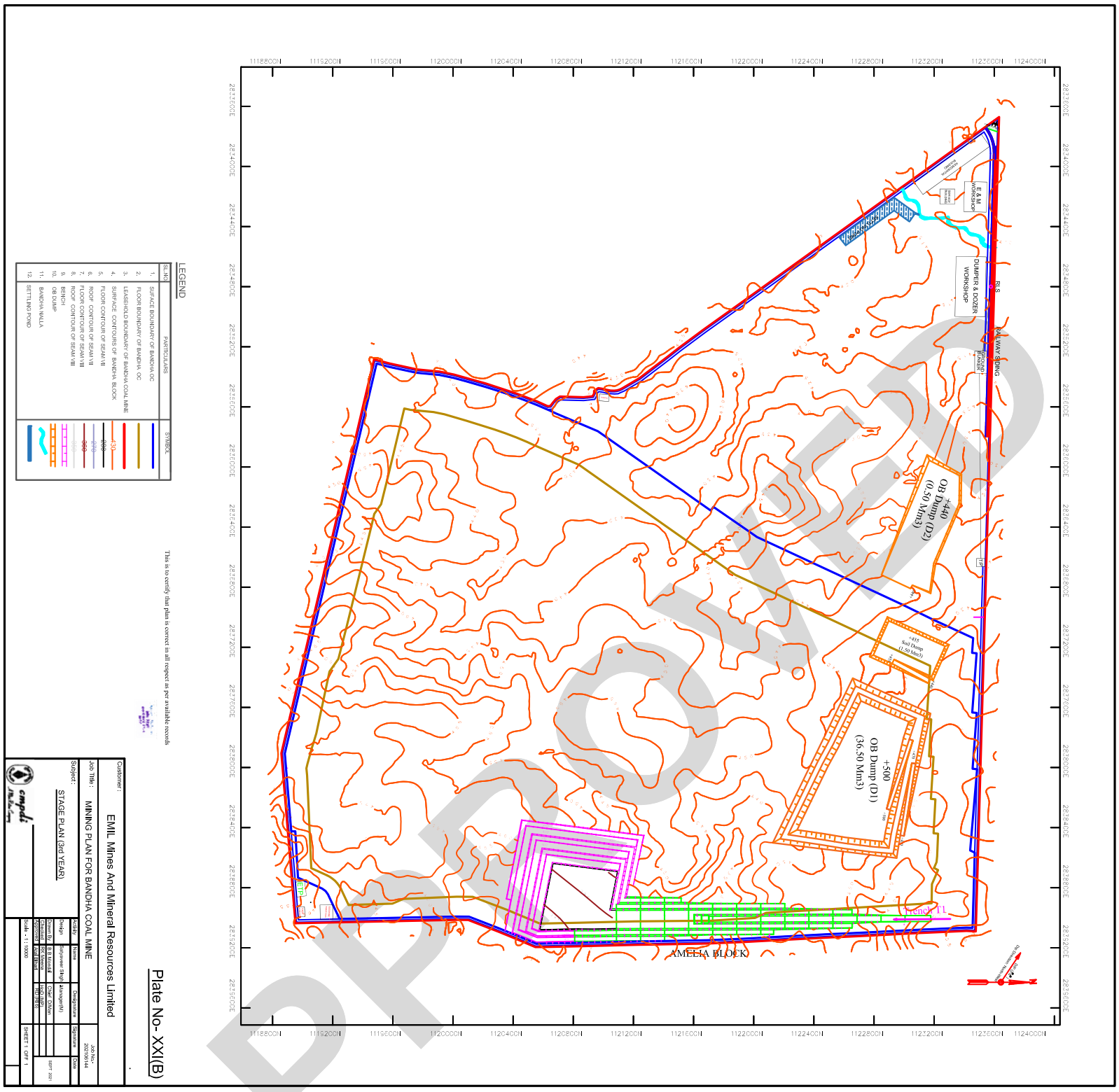
Plan / Plate 21B



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Plan / Plate 21C

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Plan / Plate 21D

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Plan / Plate 21E

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Plan / Plate 22

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