# BHARAT COKING COAL LIMITED
## (A Subsidiary of Coal India Limited)

## FEASIBILITY REPORT OF CLUSTER XII MINE OF BCCL
## (Based on the Technical Bid of AMR-BBB Consortium and submitted by B.C.C.L)

| Sl No | Name of Mines | Production Capacity (MTY) | | Lease Hold Area (Ha) | Life (in Years) |
|---|---|---|---|---|---|
| | | Normative | Peak | | |
| 1 | Kapuria UG Mine | 2.40 | 3.12 | 809.60 | > 30 |

**March, 2012**

## Prepared by


## Prepared by CMPDI, Regional Institute-II

(A Subsidiary of Coal India Limited)

KOYLA BHAWAN, KOYLA NAGAR,

**DHANBAD-826 005**

## Executive Summary

Underground mining in India has high production potential. BCCL took initiative for exploiting underground coal resource by inviting global tenders on turnkey basis for development and operation of high capacity underground mines. Based on the tender document provided by CIL, global tender was floated by BCCL for Kapuria underground mine for development of mine infrastructure and to achieve a **minimum** production of 2 million tonne per annum of coal for 9 years**.**

Accordingly the name of the work as defined in NIT was **Development of Kapuria block and extraction of coal from Kapuria block, Western Jharia Area by mass production technology package for a minimum guaranteed production of 2.0 Mty on turnkey basis. Work includes additional exploration (if desired so by the contractor); preparation of mining plan, detailed Project Report & EMP; obtaining approvals from concerned authorities.**

In response to the NIT, three tenderers submitted their bids:

1. M/s AMR-BBB Consortium
2. M/s Indu Projects Limited
3. M/s Sri Avantika Contractors (I) Ltd., M/s Donetsksteel Iron & Steel Works & M/s T-Machinery as Consortium

M/s AMR-BBB Consortium and M/s Indu Projects Limited were found to be techno-commercially qualified and as such their price bids were opened. M/s AMR-BBB Consortium turned out to be L1 bidder with lower LRMC of ` 1762.21/Tonne against ` 2977.96 / Tonne calculated for M/s Indu Projects Limited.

Kapuria geological Block with an area of about 6.4 Sq.Km is located in north-central part of Jharia Coalfield and is completely virgin. The block is occupied by rocks of Barren Measure Formation which overlie the coal bearing Barakars of Gondwana Super Group and Post Gondwana intrusives, apart from soil and alluvium of recent era. The area is mostly under soil cover and good rock exposures are rare. 9 normal faults have been deciphered based on surface and sub-surface data. Out of the 9 faults, 8 are strike faults and one is an oblique fault. 7 faults dipping southerly and two are dipping towards north. The throw of the faults varies from 10 m to 290 m. With borehole density of 8 BH/ $Km^2$ , geological reserve of coal seams upto XV seam is 146.17 Million Tonnes. Further, additional drilling is going on in the area for improving the exploration status of the block and supplementing its geological data base. The general strike of the area is WNW-ESE which gradually changes to NW-SE towards the SE part of the block. The beds dip gently at $5^o$ to $12^o$ towards SSW which turn SW in the eastern part of the block.

The generalised sequence and thickness of extractable coal seams in descending order are shown in the table below.

| Seam | Depth Range of seam (m) | Thickness Range (m) |
|---|---|---|
| XVIIIA | 235-480 | 0.53-3.74 |
| L-6 | 315-650 | 0.79-4.50 |
| L-5 | 325-660 | 0.05-3.22 |
| XVIC | 385-760 | 1.42-4.25 |
| XVIB | 395-770 | 0.31-3.76 |
| XVIA | 455-850 | 4.55-8.38 |
| XV | 475-860 | 2.18-5.41 |

The short listed L1 bidder M/s AMR-BBB Consortium has submitted a technical bid for exploitation of the seams by Powered support longwall technology. The minimum guaranteed production quoted by the bidder is 20.024 Million Tonnes in nine years commencing from the fifth year. Powered support proposed will provide a support density of 90-100 Tonne/ $m^2$. The gate roads shall be driven by Bolter miner and supported by steel bolts with quick setting resin capsules after RMR studies.

As the block has no infrastructure, mine service buildings for mine administration, sub-station, workshop, stores, Coal handling plant are proposed by the bidder near proposed main access of the mine. The access of the seams is proposed through two reverse drifts from surface with cross-section of 6 m *4m and gradient of 1 in 5. Both the drifts will intersect XVIIIA and XVIB seams. One of the drifts will used for coal evacuation and man riding and other drift will facilitate material transport. A shaft of 6.5 m diameter will also be sunk for a depth of 520 m for providing main return airway. For continuous monitoring of inflammable and noxious gases, a centralized environmental monitoring system with pre-set warning system shall be provided at all the critical places for better safety of work-persons and equipments.

The infrastructure construction and development activities proposed by the bidder are mainly construction of residential and service buildings, guest house approach roads apart from designing and developing ventilation system, mine drainage and pumping system, coal evacuation system, man-riding, material transportation, power supply and distribution arrangement, CHP, lighting arrangement, communication, control signaling system, workshop etc.

The mining lease is acquired under CBA (Acquisition and Development) Act 1957 and notification under Section 9 was published and being pursued further for Mining Right for 748.85 Ha.(approx) and all right for 60.75 Ha.(approx). The surface of entire area where caving id proposed will have to be acquired for acquisition of surface rights (all rights) for 60.75 Ha is being followed up. The total mining lease for the mine will be 809.60 Ha.(approx).

Environment Clearance for this block will be taken up after approval of DPR. The preparation of EMP falls within the scope of work of the bidder. The block comes under Cluster XII of BCCL mines under approved cluster concept.

Internal rate of Return for M/s AMR-BBB Consortium at 100% & 85% without crushing charges works out to 29.56 & 24.04 respectively. Internal rate of Return for AMR-BBB Consortium at 100% & 85% with crushing charges of Rs.77.00 works out to 31.11 & 25.45% respectively.

The summarized costs are as below:

| Items | USD | EURO | INR | Overall INR |
|---|---|---|---|---|
| **Capital Cost** | | | | |
| Offer Price | 106.94 | | 2565.80 | 7413.37 |
| Insurance & Freight | | | 514.91 | 514.91 |
| Taxes, Duties & Others | | | 1955.26 | 1955.26 |
| **Total Capital Cost** | **106.94** | **0.00** | **5035.97** | **9883.53** |
| | | | | |
| **Revenue Cost** | | | | |
| Offer Price | | | 14272.51 | 14272.51 |
| Insurance & Freight | | | | 0.00 |
| Taxes, Duties & Others | | | 2374.58 | 2374.58 |
| Total Revenue cost | **0.00** | **0.00** | **16647.09** | **16647.09** |
| | | | | |
| **Total Cost** | **106.94** | **0.00** | **21683.06** | **26530.62** |

The statement showing cost and profitability are as below:

**Cost & Profitability statement**

**Figures in /tonne**

| Item | INR | USD | EURO | Overall INR |
|---|---|---|---|---|
| Operating Cost | 842.23 | | | 842.23 |
| Power Cost | 124.78 | | | 124.78 |
| Depreciation | 411.65 | | | 411.65 |
| Interest on Loan capital | 284.15 | | | 284.15 |
| **Total Cost** | **1662.81** | **0.00** | **0.00** | **1662.81** |
| Selling Price | | | | 2570.00 |
| **Profit** | | | | **907.19** |

On the basis of above, the expected profit, from the production of 200.24 lakh tonne of coal during commercial production period as quoted by M/s AMR-BBB Consortium, L-1 bidder, is ` 1816.55 crore (approx.) at the current selling price of coal i.e. ` 2570 per tonne and profit of ` 907.19 per tonne.

## 1. BACKGROUND

Underground mining in India has high production potential. BCCL took initiative for exploiting underground coal resource by inviting global tenders on turnkey basis for development and operation of high capacity underground mines. Based on the tender document provided by CIL, global tender was floated by BCCL for Kapuria underground mine for development of mine infrastructure and to achieve a **minimum** production of 2 million tonne per annum of coal for 9 years**.**

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## 2. INTRODUCTION

Kapuria geological Block with an area of about 6.4 Sq.Km is located in north-central part of Jharia Coalfield and is completely virgin. The block is occupied by rocks of Barren Measure Formation which overlie the coal bearing Barakars of Gondwana Super

Group and Post Gondwana intrusives, apart from soil and alluvium of recent era. The area is mostly under soil cover and good rock exposures are rare. 9 normal faults have been deciphered based on surface and sub-surface data. Out of the 9 faults, 8 are strike faults and one is an oblique fault. 7 faults dipping southerly and two are dipping towards north. The throw of the faults varies from 10 m to 290 m. With b orehole density of 8 BH/ $Km^2$ , geological reserve of coal seams upto XV seam is 146.17 Million Tonnes. Further, additional drilling is going on in the area for improving the exploration status of the block and supplementing its geological data base.

## 3. PROJECT SITE INFORMATION

Kapuria Block is situated in Dhanbad district of Jharkhand. At present no mining activity exists and the block is completely virgin. The nearest railway station is Dhanbad Junction of East Central Railway, which is about 15 kms away from block. The block is bounded by:

Latitude : $23^0$44'30" N to $23^0$46'25" N,
Longitude : $86^0$16'50" E to $86^0$19'55" E,

Kapuria geological Block, covering an area of about 6.4 Sq.Km is located in north-central part of Jharia Coalfield. The area is well connected by road and rail. The district town Dhanbad is about 15 Kms South-east of the block It is included in the Survey of India Toposheet No. 731/586. Geographically, the block is bounded as follows :

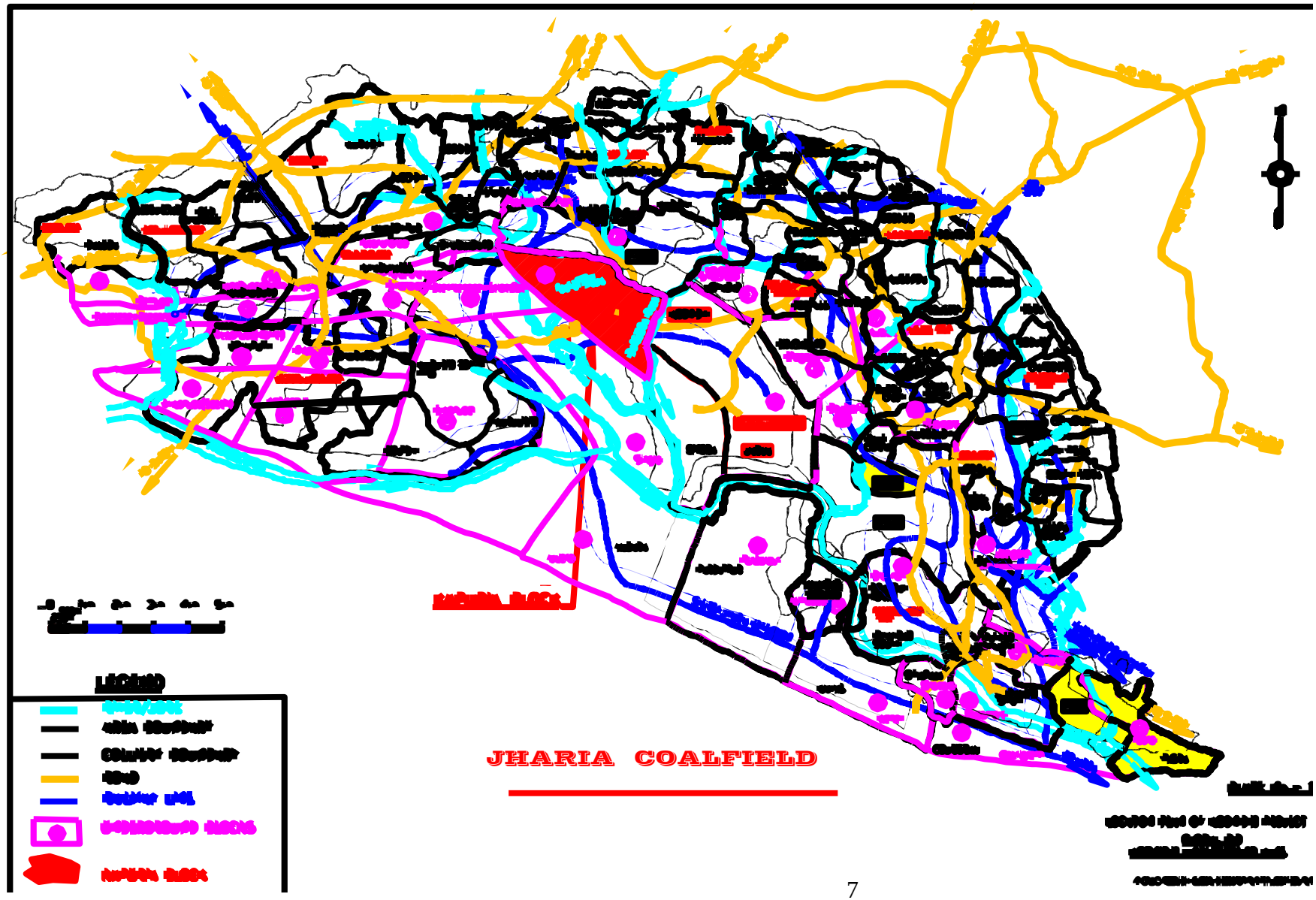
North - Bhelatand Colliery in the east & Malkera Colliery (TSL) in the west
East - Western edge of Jarian Nala (Moonidih).
South - Underground position of fault F1-F1 in seam XV.
West - Eastern edge of Khudia Nala.

The southern boundary of the block has been kept at underground position of major fault F1-F1 in XV seam for the purpose of exploration. However, the area south of this fault is unexplored and has not been included in any exploration block. It is therefore, considered that the southern boundary of this block should be kept upto Moonidih siding line for the purpose of surface rights.

The coalfield lies in the sub-humid belt of Jharkhand and the climate is extreme in the region. The overall temperature during the summer (April to mid June) rises upto $44^0$ C while during winter (late November to February) the temperature drop

below $10^0$ C. The average annual rain fall of the area is about 1380 mm with maximum precipitation during June to October.

The area, in general, presents a flat to undulating topography. The Katri Nala, which joins Damodar river in the south, together with its two tributaries, Khudia and bansjora, constitutes the main drainage Channel in the area. Large part of Khudia and Katri Nalas flow across the strike of the formation.


JHARIA COALFIELD

## 4. GEOLOGY AND DEPOSIT APPRAISAL

Kapuria exploration block occupies by rocks of Barren Measure Formation which overlie the coal bearing Barakars of Gondwana Super Group and Post Gondwana intrusives, apart from soil and alluvium of recent era. The area is mostly under soil cover and good rock exposures are rare. Most of the outcrops, wherever exposed, are sandstone and arenaceous shales. Prominent outcrops are noticed along Khudia, Katri and Jarian Nalas. The generalized stratigraphic sequence of rock formations in Kapuria block is given below.

| | | | |
|---|---|---|---|
| Recent/Sub-recent | | | Soil / Alluvium |
| _____ Unconformity _____ | | | |
| Post Gondwana<br>Gondwana Super Group | Lower Gondwana | Damuda Group | Basic Intrusives<br>Barren Measures Formation<br>Talchir Formation |
| ____-_____ Unconformity _____ | | | |
| | | Metamorphics | |

The general strike of the area is WNW-ESE which gradually changes to NW-SE towards the SE part of the block. The beds dip gently at $5^o$ to $12^o$ towards SSW which turn SW in the eastern part of the block. The dip appears to have steepened at depth. However in case of fault zones, the dips are as high as $50^o$.

Nine normal faults have been deciphered based on surface and sub-surface data. Out of the 9 faults, 8 are strike faults and one is an oblique fault. 7 faults dipping southerly and two are dipping towards north. The throw of the faults varies from 10 m to 290 m. Based on the borehole data, the dip of the faults are generally 55 to $60^o$. Hence, in case of faults where positive data are not available, it has been assumed to range between $55^o$ to $60^o$.

## 5. MINE RESERVE

| Seam as per geological nomenclature | GEOLOGICAL RESERVES IN MILLION TONNE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | SECTOR – I | | | SECTOR - II | | | TOTAL | | |
| | Thickness 1.2m - 2m. | > 2 m | Sub-Total | Thickness 1.2m - 2m. | > 2 m | Sub-Total | Thickness 1.2m - 2m. | > 2 m | Total |
| PRIME COKING COAL | | | | | | | | | |
| XVIIIA | 3.948 | 1.437 | 5.385 | 2.566 | 1.891 | 4.457 | 6.514 | 3.328 | 9.842 |
| L-6 | 3.943 | | 3.943 | 5.118 | 4.669 | 9.787 | 9.061 | 4.669 | 13.73 |
| L-5 | 2.832 | 4.212 | 7.044 | 2.108 | 5.948 | 8.056 | 4.940 | 10.16 | 15.1 |
| XVIC | 0.013 | 9.105 | 9.118 | 0.046 | 7.863 | 7.909 | 0.059 | 16.968 | 17.027 |
| XVIB | 1.514 | 0.958 | 2.472 | 0.896 | 6.725 | 7.621 | 2.410 | 7.683 | 10.093 |
| XVIA | 0.129 | 3.156 | 3.285 | 0.077 | 2.761 | 2.838 | 0.206 | 5.917 | 6.123 |
| XV | | 2.239 | 2.239 | 0.05 | 0.898 | 0.948 | 0.050 | 3.137 | 3.187 |
| **TOTAL** | **12.379** | **21.107** | **33.486** | **10.861** | **30.755** | **41.616** | **23.24** | **51.862** | **75.102** |
| MEDIUM COKING COAL | | | | | | | | | |
| XVIIIA | | | | | | | | | |
| L-6 | 0.072 | | 0.072 | | | | 0.072 | | 0.072 |
| L-5 | 0.238 | 0.113 | 0.351 | 0.028 | 0.007 | 0.035 | 0.266 | 0.12 | 0.386 |
| XVIC | 0.23 | 0.864 | 1.094 | 0.064 | 3.713 | 3.777 | 0.294 | 4.577 | 4.871 |
| XVIB | 2.115 | 0.552 | 2.667 | 0.772 | 2.745 | 3.517 | 2.887 | 3.297 | 6.184 |
| XVIA | | 16.982 | 16.982 | 0.534 | 5.792 | 6.326 | 0.534 | 22.774 | 23.308 |
| XV | | 9.925 | 9.925 | 0.24 | 9.248 | 9.488 | 0.240 | 19.173 | 19.413 |
| **TOTAL** | **2.655** | **28.436** | **31.091** | **1.638** | **21.505** | **23.143** | **4.293** | **49.941** | **54.234** |
| NON-COKING COAL | | | | | | | | | |
| XVIIIA | | | | | | | | | |
| L-6 | | | | | | | | | |
| L-5 | | | | | | | | | |
| XVIC | | | | | 0.308 | 0.308 | | 0.308 | 0.308 |
| XVIB | | | | 0.061 | 0.74 | 0.801 | 0.061 | 0.74 | 0.801 |
| XVIA | | 3.481 | 3.481 | 0.248 | 3.493 | 3.741 | 0.248 | 6.974 | 7.222 |
| XV | | 3.613 | 3.613 | 0.327 | 4.568 | 4.895 | 0.327 | 8.181 | 8.508 |
| **TOTAL** | | **7.094** | **7.094** | **0.636** | **9.109** | **9.745** | **0.636** | **16.203** | **16.839** |
| **GRAND TOTAL** | **15.034** | **56.637** | **71.671** | **13.135** | **61.369** | **74.504** | **28.169** | **118.006** | **146.175** |

## 6. DESCRIPTION OF COAL SEAMS

The generalised sequence and thickness of existing coal seam(s) and intervening partings in descending order are shown in the table below.

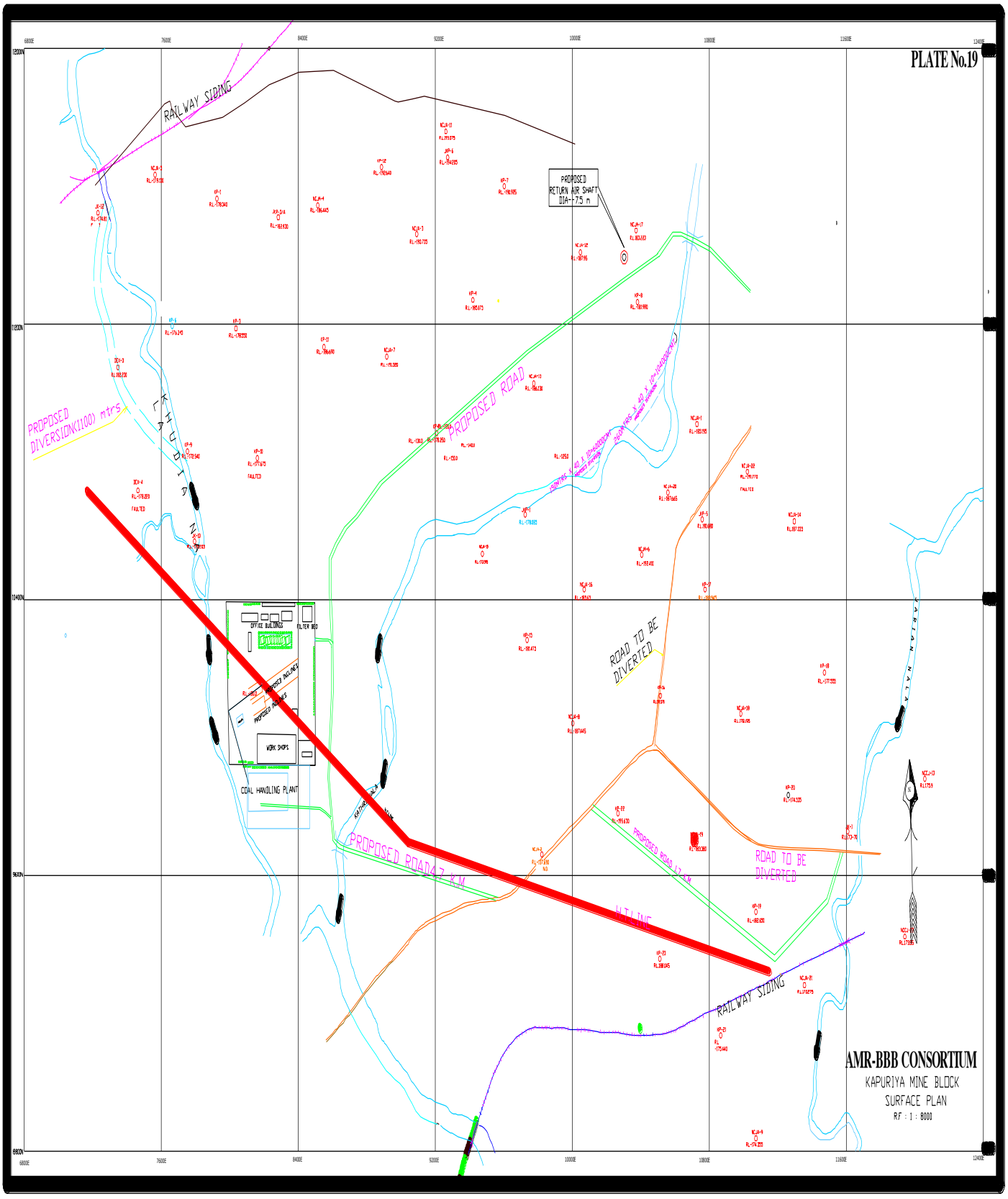
| Seam/ Parting | Depth Range of seam (m) | Thickness Range (m) | Quality/ Grade of seam |
|---|---|---|---|
| L-14 | | 0.05-0.56 | |
| Parting | | 15.27-35.73 | |
| L-13 | | 0.04-1.62 | |
| Parting | | 25.10-47.72 | |
| L-12 | | 0.50-1.55 | |
| Parting | | 13.76-29.81 | |
| L-11 | | 0.07-1.17 | |
| Parting | | 12.49-32.14 | |
| XVIIID | | 0.15-1.18 | |
| Parting | | 5.37-14.53 | |
| KPL-5 | | 0.08-1.29 | |
| Parting | | 6.24-15.12 | |
| XVIIIC | | 0.08-1.06 | |
| Parting | | 4.51-11.50 | |
| KPL-4 | | 0.05-0.89 | |
| Parting | | 2.51-20.19 | |
| XVIIIB | | 0.03-0.54 | |
| Parting | | 0.82-9.12 | |
| XVIIIA | 235-480 | 0.53-3.74 | ST-I to W-II |
| Parting | | 2.08-7.30 | |
| KPL-3 | | 0.09-0.87 | |
| Parting | | 1.80-11.97 | |
| XVIII | | 0.15-1.60 | |
| Parting | | 18.18-31.35 | |
| KPL-2 | | 0.04-0.80 | |
| Parting | | 4.96-17.62 | |
| L-10 | | 0.10-2.07 | |
| Parting | | 9.20-17.73 | |
| L-9 | | 0.05-0.58 | |
| Parting | | 8.13-26.81 | |
| XVIIA | | 0.06-1.60 | |
| Parting | | 8.26-34.19 | |
| L-8 | | 0.09-1.05 | |
| Parting | | 14.43-29.97 | |
| XVII | | 0.14-0.95 | |
| Parting | | 9.92-20.84 | |
| L-7 | | 0.05-0.35 | |
| Parting | | 24.41-39.72 | |
| L-6 | 315-650 | 0.79-4.50 | ST-II to W-IV |

| Seam/ Parting | Depth Range of seam (m) | Thickness Range (m) | Quality/ Grade of seam |
|---|---|---|---|
| Parting | | 1.20-17.99 | |
| L-5 | 325-660 | 0.05-3.22 | ST-I to W-III |
| Parting | | 6.13-20.71 | |
| L-4 | | 0.06-1.17 | |
| Parting | | 8.62-23.10 | |
| KPL-1 | | 0.06-1.36 | |
| Parting | | 7.60-39.57 | |
| XVIE | | 0.11-2.00 | |
| Parting | | 14.37-27.80 | |
| XVIC | 385-760 | 1.42-4.25 | ST-I to W-II |
| Parting | | 0.71-9.05 | |
| XVIB | 395-770 | 0.31-3.76 | ST-I to W-III |
| Parting | | 49.26-79.38 | |
| XVIA | 455-850 | 4.55-8.38 | ST-I to W-III |
| Parting<br>XV | 475-860 | 2.46-17.42<br>2.18-5.41 | ST-I to W-III |

**The extractable coal seams are XVIIIA, L-6, L-5, XVIC, XVIB, XVIA and XV**.

## 7. MINE ENTRIES

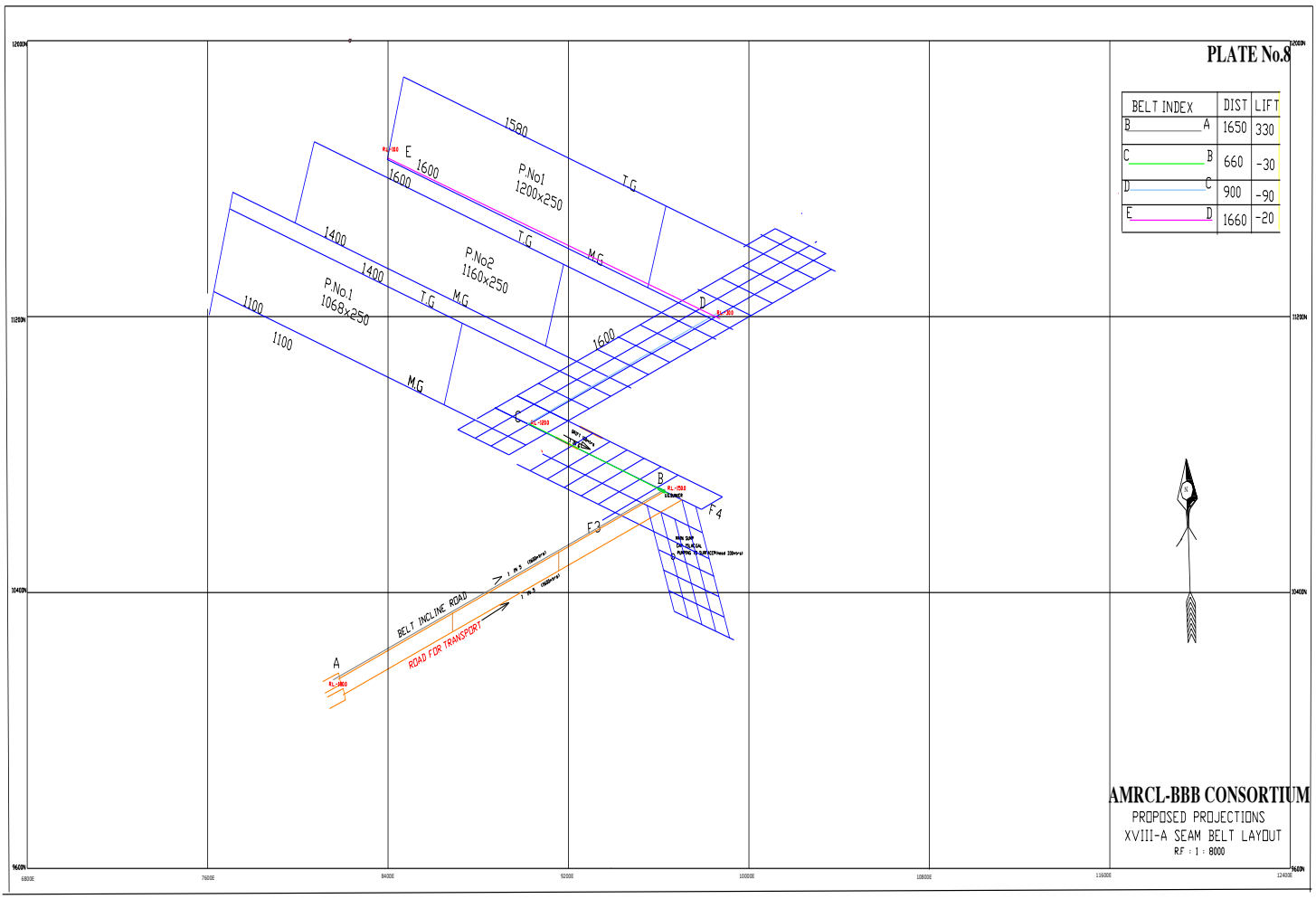
The access of the seams is proposed through two reverse drifts from surface with cross-section of 6 m *4m and gradient of 1 in 5. Both the drifts will intersect XVIIIA and XVIB seams. One of the drifts will used for coal evacuation and man riding and other drift will facilitate material transport. A shaft of 6.5 m diameter will also be sunk for a depth of 520 m for providing main return airway.

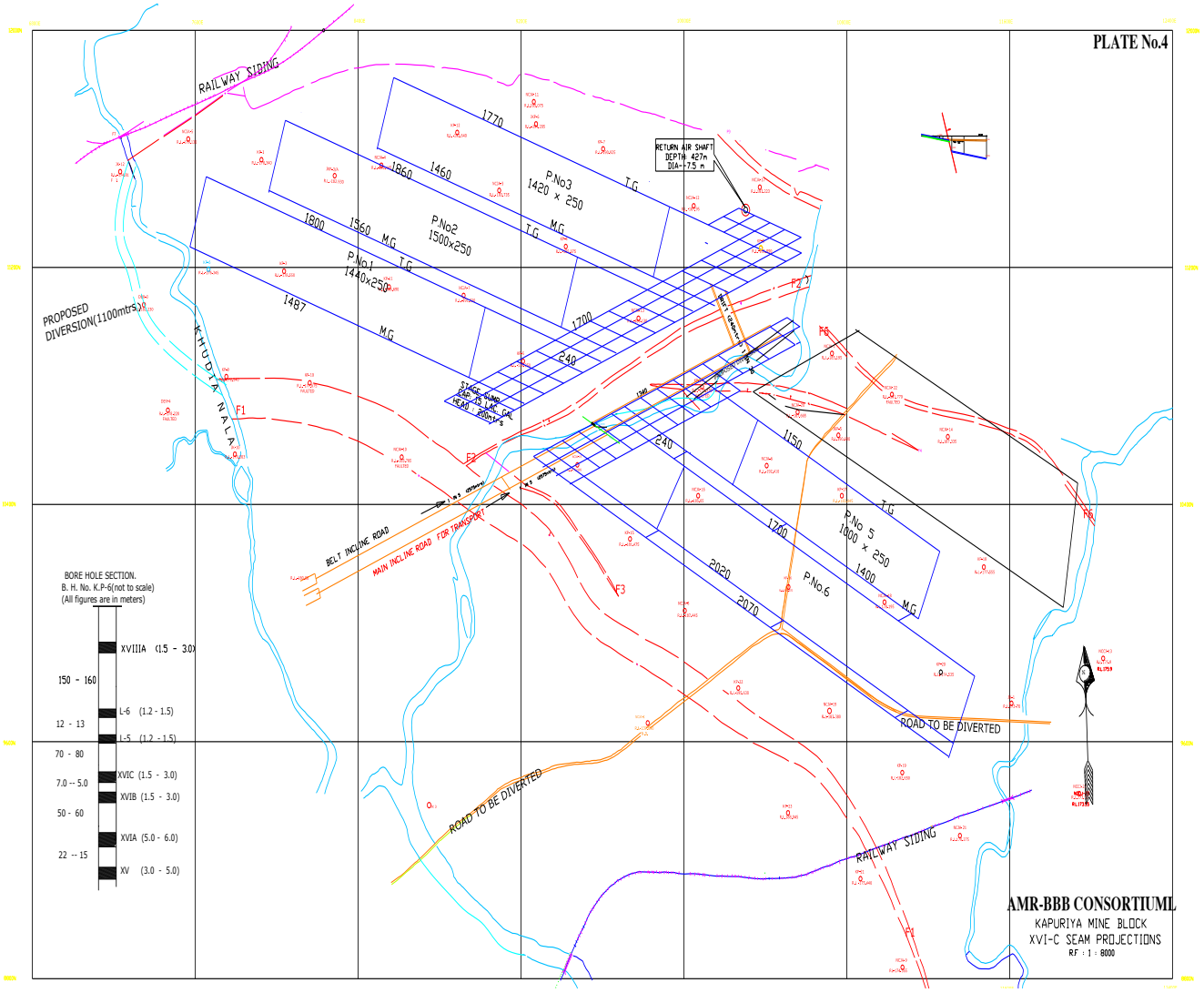



**Surface Plan of Kapuria**

## 8. METHOD OF MINING/MINING SYSTEM & EQUIPMENT

The short listed L1 bidder M/s AMR-BBB Consortium has submitted a technical bid for exploitation of the seams by Powered support longwall technology. The minimum guaranteed production quoted by the bidder is 20.024 Million Tonnes in nine years with longwall method having face length of 250 m . The production of commercial production from longwall face will commence from the fifth year. Powered support proposed will provide a support density of 90-100 Tonne/ $m^2$. The gate roads shall be driven by Bolter miner and supported by steel bolts with quick setting resin capsules after RMR studies. To match the fast rate of retreat of longwall face, the panels shall be prepared much ahead and rate of development shall match the planned retreat of faces. The panel layouts of XVII A and XVI C seams are given below:





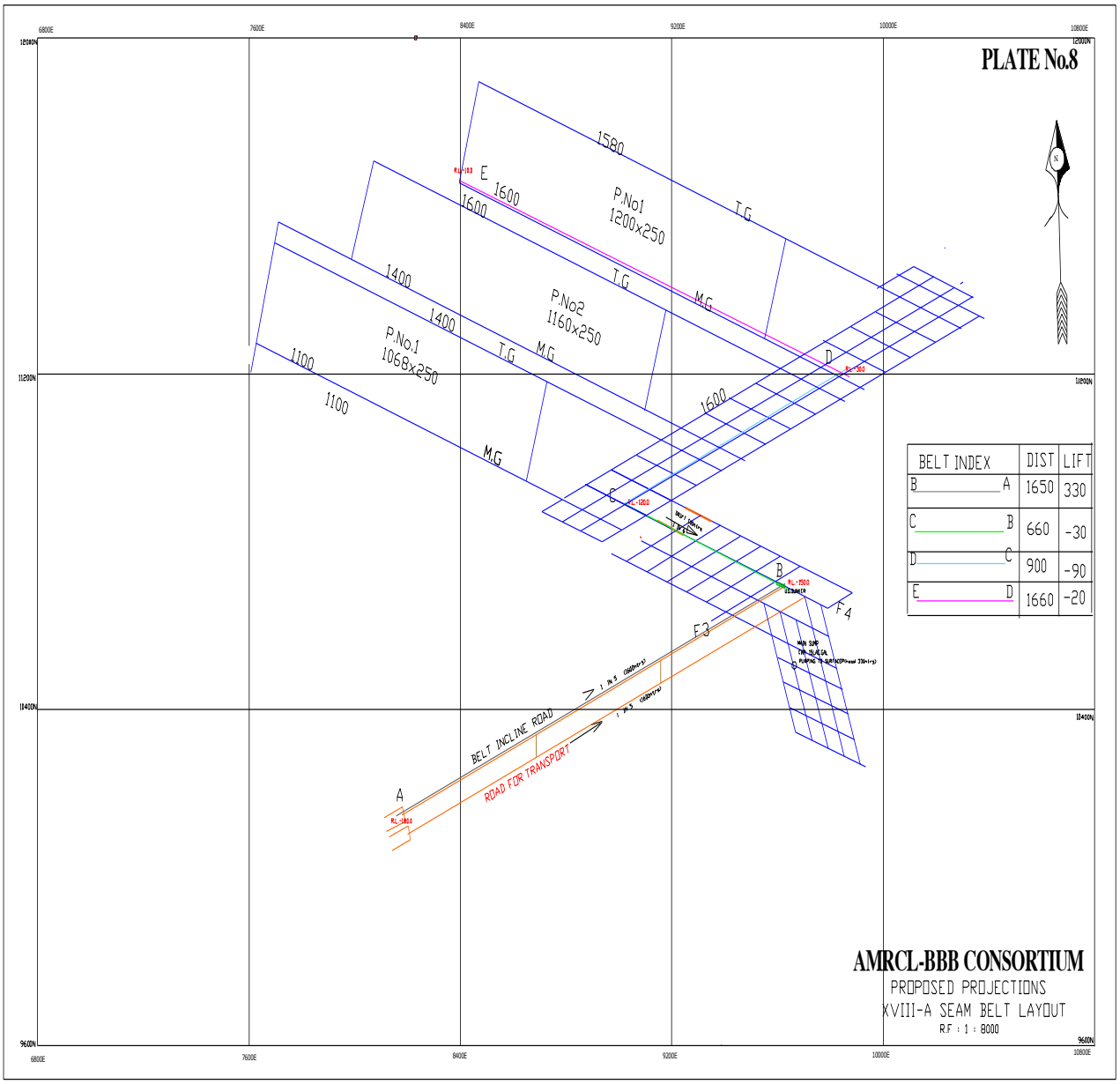

## 9. COAL PRODUCTION

| SL NO. | YEAR | COAL PRODUCTION ((Million Tonnes) |
|---|---|---|
| **1** | 1st year | 1.892 |
| **2** | 2nd year | 1.849 |
| **3** | 3rd year | 1.914 |
| **4** | 4th year | 1.940 |
| **5** | 5th year | 2.022 |
| **6** | 6th year | 2.348 |
| **7** | 7th year | 2.456 |
| **8** | 8th year | 2.537 |
| **9** | 9th year | 3.066 |
| | **Total** | **20.024** |

## 10. COAL AND MATERIAL TRANSPORTATION

Two reverse drifts 50 m apart are proposed away from Khudia Nalla at 1 in 5 gradient with cross section of 6 m * 4 m. One drift shall be equipped with Belt conveyor and man-riding and second drift is planned for material transportation.

Main trunks for sector-I and II are planned parallel to fault F2-F2 at a gradient of 1 in 10. Four trunk headings, each with width of 5.5 m to 6 m and height up to seam thickness have been planned for panel entries. Two such entries shall serve for material and coal transportation. For coal evacuation, the bidder has proposed 1.2 m wide trunk belt conveyor with capacity of 1500 Tonne per hour. One underground bunker in XVIIA seam is also proposed for cushion to outbye trunk belt conveyor system.

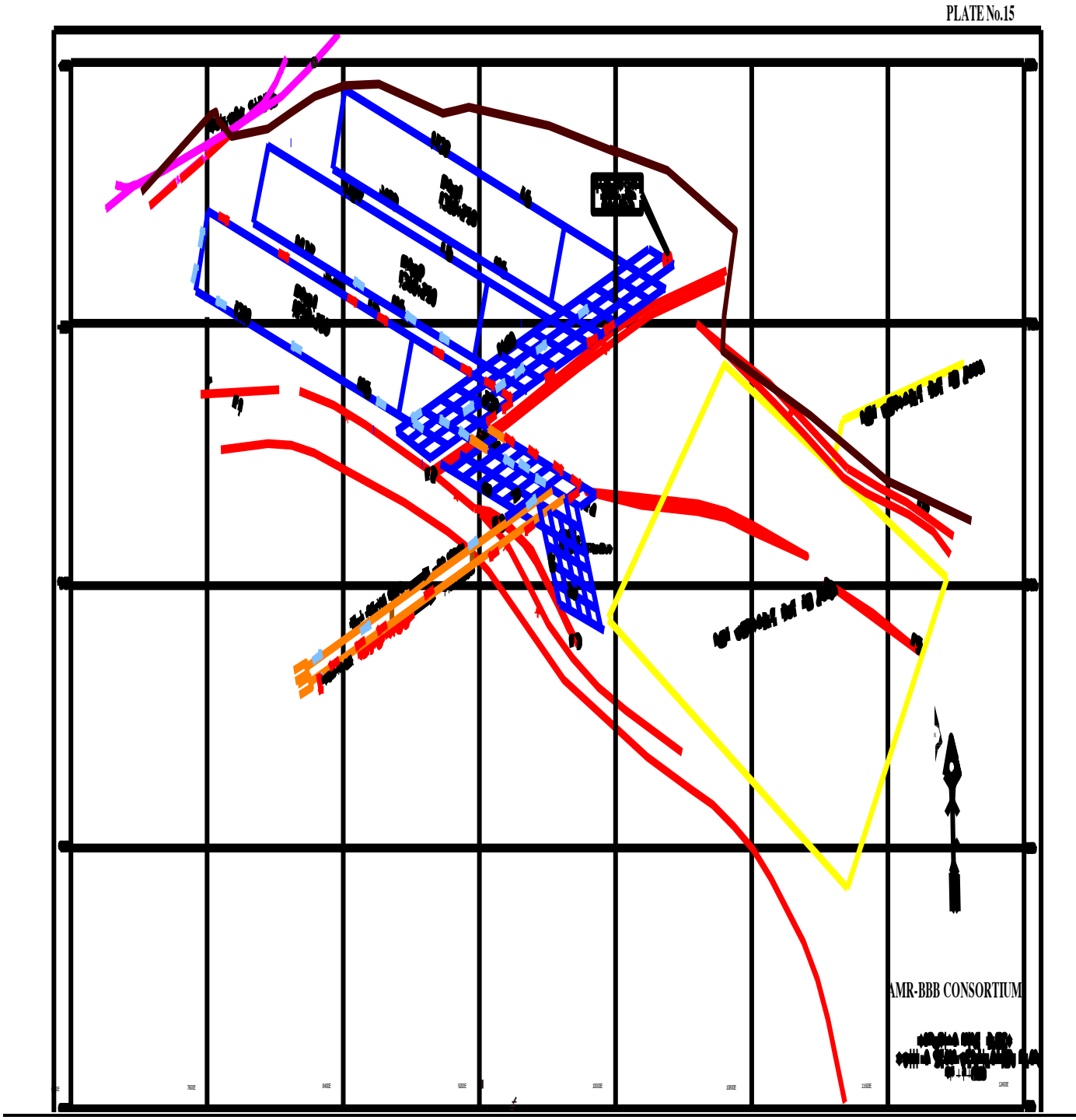



## 11. MINE VENTILATION

The requirement of ventilation has been planned by the bidder for one longwall, three development units and auxiliary equipments. In view of the gassiness of seams and hot conditions likely to prevail with the depth of the workings, the quantity and quality shall be ensured for safety and efficiency of men and material. Fan capacity has been estimated to be 200 $m^3$ / sec. Provision for air conditioning plant has been made. Scientific study is proposed to optimize the effective ventilation system.

Centralised environmental monitoring system for continuous monitoring of inflammable and noxious gases at all the critical places in the mine to ensure safety of persons and

equipments. Pre-set warning levels will be fixed for gases to give alerts for timely corrective actions.




**Ventilation Plan of XVIIA seam**

## 12. PUMPING AND DRAINAGE

As per the bid submitted by the bidder, peizometry studies will be done during scientific studies stage to assess the make of water from the mine. Apart from this, experience of adjacent mines shall too be considered to estimate the make of water. As it is a multi-seam mining, water from upper seams can percolate down to bottom seams as the extraction progresses depending on the partings. The pumping capacity will be increased as the extraction progressed to deeper seams. Due to higher depths of pumping involved the main sump for the mine is proposed in L6 seam of sector-II from which water can be collected to the main sump by system of stage pumping for various locations of the mine.

For panels in sector I in all seams the gate roads are planned inbye to facilitate the drainage towards stage pumps. Main pumping capacity planned for the mine is 3000 GPM with some standby capacity. For development small capacity pumps preferably with compressed air will be used for dip drivages.

## 13. POWER SUPPLY

The total installed load for the project during its maximum capacity of production would be around 15 MVA. The supply voltage for underground 11/6.6 V depending on the machinery voltage is stepped down to 1.1 KV and 550 V. The number of feeders will be taken down for various utilities through drifts and boreholes and provision is also proposed to be made to change over the feeders to other utilities. The underground sub-stations would be relocated in working seams as per the mine progress and operating convenience.

## 14. MINE INFRASTRUCTURE

The main surface infrastructure, proposed to be located near the main access drifts includes main mine sub-station, workshop, stores, coal handling plant and service buildings for mine administration, the approach and coal transport roads to air shaft, office and internal roads. One guest house for experts and residential accommodation

for the project management team and for skilled personnel are also planned by the bidder.

## 15. COMMUNICATION AND LIGHTING

Every working part of the mine will be connected with intrinsically safe underground telephones for fast communication both for emergencies and working needs. Flame proof lighting arrangements will be provided for all working areas.

## 16. LAND REQUIREMENT

The mining lease is acquired under CBA (Acquisition and Development) Act 1957 and notification under Section 9 for acquisition of surface rights (all rights) for 60.75 Ha is being followed up.

## 17. ENVIRONMENT MANAGEMENT

There will be no health hazard due to dust or gasses in the underground as well as in the surface atmosphere. Proper dust suppression measures will be inbuilt in the deployed machines, wetting the dust with water and adequate ventilation system will dilute the concentration of dust and noxious gases below the permissible limits. Due to extraction of multiple seams, subsidence is likely to be more in sector-I compared to sector-II. The scientific studies have been proposed and subsidence areas over the panels will be filled as suggested and recommended. Green belt is proposed to be developed along the roads, Coal handling plant and other vacant places to improve the aesthetics of the area.

The mine water discharged on the surface will be collected in the surface settling tank where suspended solids will be settled. The clear water after sedimentation will be reused for water sprinkling, plantation etc and excess water will be discharged into a constructed drain which in turn will discharge the water into the natural drainage system in the area..

Environment Clearance for this block will be taken up after approval of DPR. The preparation of EMP falls within the scope of work of the bidder. The block comes under Cluster XII of BCCL mines under approved cluster concept.

## 18. FINANCIAL EVALUATION

Long range marginal cost (LRMC) determined for L1 bidder is ` 1762.21/Tonne. Internal rate of Return for M/s AMR-BBB Consortium at 100% & 85% without crushing charges works out to 29.56 & 24.04 respectively. Internal rate of Return for AMR-BBB Consortium at 100% & 85% with crushing charges of Rs.77.00 works out to 31.11 & 25.45% respectively.

The summarized costs are as below:

| **Items** | **USD** | **EURO** | **INR** | **Overall INR** |
|---|---|---|---|---|
| **Capital Cost** | | | | |
| Offer Price | 106.94 | | 2565.80 | 7413.37 |
| Insurance & Freight | | | 514.91 | 514.91 |
| Taxes, Duties & Others | | | 1955.26 | 1955.26 |
| **Total Capital Cost** | **106.94** | **0.00** | **5035.97** | **9883.53** |
| | | | | |
| **Revenue Cost** | | | | |
| Offer Price | | | 14272.51 | 14272.51 |
| Insurance & Freight | | | | 0.00 |
| Taxes, Duties & Others | | | 2374.58 | 2374.58 |
| Total Revenue cost | **0.00** | **0.00** | **16647.09** | **16647.09** |
| | | | | |
| **Total Cost** | **106.94** | **0.00** | **21683.06** | **26530.62** |

The statement showing cost and profitability are as below:

**Cost & Profitability statement**

**Figures in /tonne**

| Item | INR | USD | EURO | Overall INR |
|---|---|---|---|---|
| Operating Cost | 842.23 | | | 842.23 |
| Power Cost | 124.78 | | | 124.78 |
| Depreciation | 411.65 | | | 411.65 |

| | | | | |
|---|---|---|---|---|
| Interest on Loan capital | 284.15 | | | 284.15 |
| **Total Cost** | **1662.81** | **0.00** | **0.00** | **1662.81** |
| Selling Price | | | | 2570.00 |
| **Profit** | | | | **907.19** |

On the basis of above, the expected profit, from the production of 200.24 lakh tonne of coal during commercial production period as quoted by M/s AMR-BBB Consortium, L-1 bidder, is ` 1816.55 crore (approx.) at the current selling price of coal i.e. ` 2570 per tonne and profit of ` 907.19 per tonne.

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