Pre-feasibility Report

1.1 Brief Description & History of the Project

The Auranga coalfield (C.F.) is the eastern most part of North Koel Valley of Gondwàna basin. It is about 8 km west of north Karanpura Coalfield, which is western most part of Damodar Valley of Gondwana Basin.

Auranga CF covers an area of 250 Sq.km. and is Located in Latehar district of Jharkhand State. The coalfield, trending east- west, is a narrow Gondwana basin, wider in east and tapering in the west. Tubed Block is one of the identified non-CIL blocks and lies in the northern part of Auranga C .F.

CMPDIL awarded the job of Exploration & Preparation of Geological Repot of Tubed Coal Block to Mineral Exploration Corporation Limited under priority Captive Mining Blocks.

MECL, commenced drilling in Tubed Block of Auranga CF, in June 2004 & completed 3011.5m (20Bhs) till January2005, in an area of 4.6 Sq. Km forming the Tubed Block.

Tubed Coal Block (460 ha.) of Auranga Coal Field is allotted to "Damodar Valley Corporation" for the development of the coal block. Proposed lease covers an area of 4.6 Sq. Km. of Auranga Coal Field which covers the total area of 250 sq. km. lying in the latehar district of Jharkhand state. This coal fields, trending East-West is a narrow Gondwana basin, wider in east and tapering in the west. Tubed block is one of the Non-CIL blocks and lies in the northern part of Auranga C.F. The annual rated capacity of the mine is 6.0 MTY of Coal.

Tubed Coal Block is envisaged to produce washery grade-IV coal to meet the demand of thermal coal. Project Report for Tubed Coal Block Opencast has been prepared for a target Production of 6.0 MTY of Rs. 1300.00 Crore.

Present status of mine:

The proposal is to open a new opencast coal mine project of 6.0MTY in an ML area of 460 ha. of which Private Land is 235.24 ha., Government Land is 62.37 ha. and forestland is 162.39 ha.

Mining Plan approved from Ministry of Coal vide letter No. 13016/19/2009-CA-I dated 12.10.2009 & Mine Closure Plan vide Letter No. 34011-03-2011-CPAM dated 10.08.2011and the same has been transfer in the name of Damodar Valley Corporation. Mining Lease – (Administrative approval of central Government under section 5 (1) and/or

Section 6 (1) of MMDR Act, 1957) approved by Ministry of Coal vide letter No. 13016/19/2009-CA-I dated 28.03.2012 and the same has been transfer in the name of Damodar Valley Corporation.

Approval of Tubed Coal Mining

The request of the Allottee was considered by the Central Government. Keeping in view the requirement of the Allotee, it was decided by the central government to allot the Tubed Coal Mine as per allotment agreement dated 07-09-2016 for targeted output of 6.0 MTY. The estimated capital investment will be about Rs. 1300.00 Crore.

Ground Water Clearance has been taken from Central Ground Water Authority, Ministry of Water Resources vide letter No. 2262 dated 17.09.2010. Railway Siding Approval has been taken from Ministry of Railway Vide letter No. 2010/TT (V)/18/TCML dated 25.03.2010 and the same has to be transferred in the name of Damodar Valley Corporation after submitted Application (Form-I / PFR) to MoEF & CC, New Delhi.

Particulars, permission, approvals or consents issued by the State Government to be obtained on application by the allottee.

S. No.	Statutory Clearance	Ministry / Agency	Letter No.	Dated
1	Rain Water Harvesting	Water Resource Department, Govt. of Jharkhand	G.W.D/365/Ranchi	14.11.2011
2	Tribal Development Plan	Office of the tribal Welfare Commissioner Jharkhand	No. 68	07.01.2011
3	River Diversion	Office of the Chief Engineer, Design Master Planning & Hydrology, Jharkhand	Latter No. 50	18.01.2011
4	Wildlife Conservation Plan	Biodiversity Conservation – cum- Chief Wildlife Warden, Jharkhand	Letter No. 977	05.09.2012

As per above the all permission has been obtained from the consent Authority but the same has to be transferred in the name of Damodar Valley Corporation after submitted Application.

1.2 Purpose of this report

The purpose of this report is to apply for grant of environmental clearance for Tubed Coal Mining from Ministry of Environment & Forests & Climate Change, Govt. of India as per provisions of EIA Notification, 2006. It is envisaged Tubed Coal Mining will run as per allotment agreement dated 07-sep-2016 for targeted output of 6.0MTY coal.

1.3 Land Requirement

The total land requirement Tubed Coal Mining has been estimated to be 460 hectare as given below.

TABLE: 1.2 OPERATIONAL LAND USE PATTERN

S. No.	Pattern of utilization	Revenue forest	Non- forest	Total
1. a)	Mining area	94.874	255.126	350.00
b)	Dumping	49.448	13.552	63.00
c)	Construction of workshop, pit office, substation canteen, project office, hospital, school, bank, extension counter etc.	1.402	9.918	11.32
2.	Prohibited and protected safety zone area and barrier for nala, road diversion for mining operation.	16.67 (3.33)*	19.01	35.68
	Grand Total	**162.394**	**297.606**	**460.00**
***Forest area of 3.33 ha in safety zone will be undisturbed. So, total forest area to be diverted will be 159.064 ha.**				

1.4 Location & Communication

The Tubed Block covering an area of 4.6 Sq Km is situated in Latehar district of Jharkhand State. The block forms a part of survey of India Toposheet No. 73 A/9 (1:50,000) between coordinates.

Latitude (N) $23^0$48’20” to $23^0$50’09”
Longitude (E) $84^0$34’09” to $84^0$35’45”

The Tubed Block is well connected by a fair weather road to district HQ. Latehar. Latehar is at a distance of about 12 km from the Coal Block. National Highway 75 (Ranchi-Daltaonganj) passes through Latehar. Latehar is at about 100 km from Ranchi which is the Capital of Jharkhand State. A broad gauge railway line between Gomoh & Barwaduh (loop line of East Central Railway) has Latehar as a railway Station.

1.5 Nature & Size

Tubed Coal Mine is a new mine proposed in Latehar District. The capacity of the project is 6 MTY. The total land requirement for this project is 460 ha. and life of the project is 30 years.

1.6 Physiography and Drainage

The block exhibits undulating topography. General slope is towards west. A prominent valley is located in SW part of the block along which Sukri River flows. The ground elevation (RL) varies from 386m in the north-west (near the river) to 412m in northeast (high Land area).

The drainage of the block is mainly controlled by Sukri River flowing in SW part of block. There are 3 East West flowing nalas which drain to Sukri River. Besides, there is also a nala located in the northern part of the block which also joins Sukri River near Bh MAT 10.

Climate

As per annual temperature map of India (National Atlas) the block falls within falls zone having daily temperature of 22^0 C-25^0 C. The summer & winters are extreme. According to the map of rain fall, the area falls in zone of 1200mm to 1400mm rainfall.

2.1 Need for the Project

With respect to the importance of the project to the nation, it can be well said that in a developing nation like India, Coal makes a backbone for infrastructural development. Thus, keeping in mind this requirement, mining of coal is essential for the nation`s growth.
Besides this, the project will prove beneficial in terms of socio-economic development as it will provide employment to locals. Further, the average income level, which is the indicator

of socio – economic status of households is expected to increase, which will result in better standard of living of the local people.

2.2 Justification for the Project

The justification of the Project arises out of the following considerations,
To bridge demand and supply gap of thermal coal, it is essential either to open new projects or to expand the existing mines where thermal coal is available for mining. As per the Geological Report on Tubed Block, sufficient coal reserves are available for quarrying.

This project is linked to 1250 MW thermal power plants (i) Mejia Thermal Power Station (MTPS) (Unit 7 & 8, 2 x 500 MW =1000 MW) at West Bengal and (ii) Chandrapura Thermal Power Station (CTPS) Unit – 8 (1 x 250 MW = 250 MW) at Jharkhand. The mining project meets the requirement of coal for the above Thermal Power Stations.

2.3 Present Proposal

The proposal is to open a new open cast coal mine project of 6MTY in an M.L area of 460 ha. of which private Land is 235.24 ha., Government Land is 62.37 ha. and forestland is 162.39 ha. It is an open cast mechanized mine of a max. depth of 230m. During mining operation, a total of 280 Mm^3 of overburden is estimated to be generated.

External Dump A

The capacity of dump A, with three layers of 30m height is estimated as 55.51 Mm^3. The total height of Dump A is projected to be + 110m over the R.L of 390 to 410 m, which is the original ground Level.

Internal Dump B & C

Internal dump B would be formed as soon as decoaled area is sufficiently created on the east side of haul road. In this case it is 3rd year onwards. The total capacity is estimated in the final stage as 75 M m^3 in different bench height as shown in final stage dump plan of

approved mining plan. The top RL of Dump B would be 500m, which is also the RL of external O.B. dump A.

The internal dump C is located on west side of main haul road. The capacity is estimated as 100 M m^3.

External Dump D

In the last stage of 4-5 years of mine life the OB generated in dip side property (Sec IV) would total to about 40 Mm^3. It is required to be dumped externally since space for backfilling would not be sufficient. Hence 75 Ha. of non- forest land is required to be possessed after 15 to 20 years of starting the mining operation.

2.4 Difficulties and Constraints in Mining

Various geological and physical constraints in excavating the coal are listed below:

a. Presence of three major faults within the Tubed coal block with resultant displacement of coal seams.
b. The major channel of Sukri River, dissecting the coal block to be diverted at the later stage of the project. However, the small tributaries have been considered for diversion in the initial years in this feasibility report.
c. The main PWD Road passing through the property needs to be diverted for mining activity.
d. There is one full village (Dhobiajharan) and 5 part villages (Tubed, Newari, Mangra, Dihi & Ambajharan) present within the block are required to be relocated before mining operation.

2.5 Construction of Protective Embankment

Construction of protective embankment is a critical activity and a properly designed and constructed protective embankment is needed before planning any major expansion of this mine. Services of any agency with prior experience and technological know-how of design and construction of protective embankment will be taken.

2.6 Salient features of the project

ROM coal from the mine to the Receiving Pit complex of the CHP has been, planned to be received through Rear Dump Trucks (35tonnes). One number of Apron Feeder and one number of Primary Size have been considered for the system.

Miscellaneous facilities like dust control system, fire protection system, Ventilation, plant cleaning, infrastructure for preventive maintenance etc. have been envisaged. Necessary electrical, interlocking, and signaling and Communication etc. have also been considered.

Table: 2.1 Details of Sequence of Coal Seam and Parting

S. No.	Sequence of seams/parting	Rang of Seam Thickness		No. of full Intersections
		Minimum	maximum	
1.	VII-TOP	7.42 (MAT-4)	11.97 (MAT-6)	11
	Parting	1.06 (MAT-12)	3.90(AR-7)	11
2.	VII-BOT	0.85(MAT-4)	1.00(AR-7)	12
	Parting with VI	3.15(MAT-16)	13.58(MAT-18)	10
3.	VII-COMB.	9.08(MAT-8)	10.14(MAT-7)	3
	Parting	7.30(MAT-7)	9.38(MAT-11)	2
4.	VI- Parting	0.10(MAT-17)	0.64(MAT-6)	12
		4.47(MAT-11)	17.23(MAT-18)	11
5.	V-TOP	4.82(MAT-20)	8.37(MAT-18)	16
	Parting	3.74(MAT-11)	16.22(MAT-18)	13
6.	V-BOT	5.77(MAT-20)	11.22(MAT-3)	17
	Parting	1.45(MAT-7)	10.2(AR-7)	17
7.	IV-TOP	0.54(MAT-20)	7.64(MAT-3)	18
	Parting	0.76(MAT-11)	5.94(MAT-3)	18
8.	IV-BOT	0.50(MAT-20)	5.32(MAT-18)	18
	Parting	1.36(MAT-6)	9.69(MAT-12)	18

9.	III-TOP Parting	0.58(MAT-0) 1.23(MAT-1)	7.42(MAT-18) 6.97(MAT-6)	20 19
10.	III-MID Parting	0.20(MAT-9) 1.57(MAT-6)	1.94(MAT-12) 9.70(AR-11)	19 19
11.	III-BOT Parting	0.55(MAT-20) 2.38(MAT-7)	4.05(MAT-18) 8.97(*MAT-9)	21 20
12.	II Parting	4.49(MAT-20) 1.20(MAT-1)	15.48(MAT-18) 8.00(AR-II)	21 20
13.	I-TOP Parting	0.22(MAT-9) 2.01(MAT-1)	4.73(MAT-18) 6.72(MAT-6)	20 14
14.	I-BOT	0.25(MAT-14)	3.42(MAT-16)	14

2.7 Mining Parameters

Some major system parameters for both coal winning & OB removal are given below:

i) The running slope of the mining system would be about 20^0 with horizontal whereas closing slope would be 45^0.

ii) In the coal seams and parting bench height have been kept as 10m where as it is up to 15 m in top overburden and other thick inter-burdens.

iii) In this case a FRL of seams II has been considered for coal advance faces. Upper benches containing coal/parting would be advanced accordingly.

iv) Seam 1 Top which is 2-3m below the floor of seam II (base seam) would be worked by deepening parting bench wherever it achieved workable thickness of 1m and above.

v) The mining system of horizontal slicing may be changed after gaining experience and if mining along strata could not be found suitable.

2.7 Mining System and system parameters

The mining system is planned based on geological and mining characteristics of the quarriable block .i.e.

(i) Presence of 11 workable coal seam (cumulative thickness 35-40m).
(ii) Variation of dips indifferent sectors, with gradients 1:9 to1:4.
(iii) Variation of thickness of coal seams/parting
(iv) Difficult to construed haul road in sector11 because of Iess strike length and longer dip length.
(v) Keeping above in view, it is prudent to follow horizontal slicing of bench formation both for coal and OB including top overburden.

2.8 Coal Winning & O.B. Removal

Geo-Mining Parameters

Geo-mining parameters considered for the study are taken from the mining plan, same is already approved from the Ministry of Coal,

- Maximum depth of the quarry of the mine in the Tubed Block may reach up to 230 m.
- Height of the internal dump: 300m (approx.) (around150m. within pit).
- The inclination of floor of the internal dump (rise. side to dip side) is -Considered as 6 and 10 degrees with horizontal plan.
- Height of the external dump:110 m
- The floor of the external dump is considered as horizontal.

Geo-Technical Parameters

Geo technical parameters required for slope stability analysis can be determined by field geo technical investigation and various tests carried out in rock mechanics laboratory on the rock cores collected from bore holes and overburden dump materials using standard methods.

However, for this feasibility stage report in absence of detail geotechnical investigation data the parameters have been adopted from coal mines with similar geo-mining condition.

The Tubed block consisting of sandstone, shale, carb shale & coal seams of Barakar formation (15.9-268m), lies in the northern part of Auranga Coal Field, the eastern most part of the North Koel Valley of Gondwana basin. Geotechnical parameters for this study have been adopted from another coal mining project from the same Auranga Coal Field and consisting of similar sequence of rock, strata-of Barakar-Formation.

	Rock mass	Dump material	Interface material between dump and foundation	Foundation material
Cohesion	327 kN/m^2	47 kN/m^2	33 kN/m^2	234kN/m^2
Angle of internal friction	40 degree	49 degree	25 degree	35 degree
Bulk density	22 kN/m^2	18kN/m^2		24kN/m^2

3. Coal Winning & O.B. Removal

Deployment of surface miner for winning coal seams

Surface miner will be used for coal winning purposes as surface miner can cut and load hard dirt bands separately and a thin Layer of coal will be taken at a time. Hence it will also be used for maintaining quality improvement.

Instead of using raised boom of surface miner for loading coal onto dumpers the surface miner will only cut the coal for speedy removal by loading onto dumpers by pay Loaders. The Loaded dumpers will ply in strike Level as well as in haul road, and will lead to Pit Top where it will discharge coal at receiving pit. In the case of medium thick coal seams (i.e. seam II, V B, VT and VIIT constitute about 70% of total coal reserves), surface miner can be deployed by making separate benches.

Main HEMM

The machines to be deployed are in TableNo2.2

S. No.	Particulars	Size Capacity	Provision up-to 5th year	Phasing in year					Ultimate Provision
				1st	2nd	3rd	4th	5th	

A.	***HEMM FOR COAL***								
1.	Hyd. Shovel (B.H)(Diesel operated)		2	-	2	2	3	3	3
2.	Surface miner		2	-	-	1	1	2	2
3	Rear Dumpers	35 T	15	4	9	12	25	33	36
4.	Dozer with ripper	410 HP	2	1	1	2	2	2	2
5.	Wheel Dozer	300 HP	3	1	1	2	3	3	3
6.	F.E Loader		3	1	1	2	3	3	3
7.	Wagon drill	F	3	1	1	2	3	3	3
B.	**HEMM FOR OB/PARTING**								
1.	Hyd. Shovel (Electric operated)	8.3 m^3 3.2-3.8 m^3	5 6	1 3	2 5	3 5	4 6	5 6	5 6
2.	Rope Shovel(Electric operated)		-	-	-	-	-	-	
3	RBH Drill (Electric operated)	F F	5 6	1 2	2 5	3 5	4 6	5 6	8 6
4.	Dozer	410 HP	6	2	3	6	6	6	8
5.	Rear Drill (Electric operated)	85 T 35 T	36 50	6 23	13 37	19 41	25 49	36 50	44 55
c.	**HEMM FOR COMMON**								
1.	Motor Grader	280HP	2	1	1	1	2	2	3
2.	Wheel Dozer	410 HP	2	1	1	2	2	2	2
3.	Hyd. Shovel(BH)(Diesel Operator)		3	2	3	3	3	3	3
4.	FE Ioader Diesel operated		6	2	3	4	5	6	6
5.	Heavy duty trucks	40 T	50	10	28	40	50	50	50
6.	Water Sprinkler	28 KI	5	1	3	5	5	5	5
7.	Diesel Bowser	30 KI	1	1	1	1	1	1	2
8.	Diesel Hyd. Crane	75 T	1	1	1	1	1	1	1
9.	Diesel (rough	30 T	1	1	1	1	1	1	2

	terrain Crane)								
10.	Diesel (rough terrain Crane)	12 T	1	-	1	1	1	1	2
11.	Handler	8T	1	-	1	1	1	1	2
12.	Vibratory compactor for haul road	-	1	1	1	1	1	1	1
13.		9.5 Km/hr.	1	1	1	1	1	1	1
	HEMM FOR RECLAMTION								
1.	Water sprinkler	28 kl	1	-	-	1	1	1	2

3.1 Dumping Strategy

Proposed quarry is planned in Barakar formation in area which Consist of Soil/weathered mantle and Barakar rocks like sandstone and shale. The thickness of soil varies from 2.5m to 12 m. including the weathered mantle. The balance OB is constituted by Barakar measures rocks.

3.2 Waste Disposal Options Considered

Most of the over burden material will be dumped internally within the pit. However in the initial years, part of the overburden will be dumped in the external dump & before the internal dumping can start in the 4th year of mine operation.

Entire overburden removed in the initial 3 years of opencast mining operation and part of the overburden in the 4th year has to be accommodated in external dump outside the pit area as shown in the dump plan. It takes into account the fact that the external dumping in no way falls in the coal bearing area and the location of the external dumps should be closer to the mine to minimize the lead distance of hauling. Garland drains will be provided around the external dump and drained out by pumping.

3.3 Top Soil Management

The top soil consists of an average of 1 to 2 m at the top. This has been considered to be removed separately and stored in separate dump area. The top soil for the initial three years of mining will need to be stored separately. Thereafter with the completion of the

external dump the top soil generated will be spread over the same and also on the internal dump progressively.

3.4 Geological& Mining Characteristics

Based on geological & mining characteristics of the quarriable block i.e.

(i) Presence of 11workable coal sector (cumulative thickness:35-40m).
(ii) Variation of dips in different sectors , with gradients1:9 to 1:4
(iii) Variation of thickness of coal seams/parting.
(iv) Difficult to construct haul road in sector11becauseof low strike length and longer dip length. .
(v) Keeping above in view, it is prudent to follow, horizontal slicing of bench formation both for coal and OB including top overburden.

3.5 Balance Mineable Reserve & Life of Mine

A total of 189.8228 M.tes of Coal reserve have been estimated in Tubed Block out of which, 166.9688 M.tes fall in Proved category and 22.854 M.tes in indicted category. However, for mining plan, total reserves of 189.8228 M.tes have been considered.

3.6 Life of the Project:-

Tubed Coal Mine is estimated as 30 yrs. including mine development period and working of coal by high wall mining.

The proposed mine is planned for nominal production of 6 MTY for a life of 30 years.

3.7 Water Demand

Drinking ground water requirement is 30.0 KLD. For Mining and allied activities water requirement is 800KLD which will be met from mine discharge water.

In the initial years of mine life the water supply for industrial use as well as domestic water is proposed to be drawn from ground water sources. Afterwards, mine water will be

treated and used for all industrial & miscellaneous needs. For drinking water, ground water would be pumped treated & used.

3.8 Water Management

(A) Mine Water

In course of mining waste water will be collected in the sump constructed in the deepest area. Source of mine water will be rain water and ground water seepage. The pumped out water will be led into a sedimentation pond for proper treatment before it is used for industrial purposes or discharged into natural drains.

(B) Workshop Effluent

Waste water will be generated in the work shop where the Dumper & other mining equipment will be washed regularly. It is proposed to provide on Effluent Treatment Plant (ETP) for treatment of effluent from workshop. Treated water will be recycled for washing in the workshop. This will reduce fresh water requirement.

(C) Domestic Effluent

Sewage & salvage water will be generated in town ship. A Sewage Treatment Plant (STP) will be provided for treatment of sewage water. Treated sewage will be recycled for horticultural use. This will also reduce fresh water requirement for the project**.**

3.9 Power Supply

Electric Power Line of Jharkhand State Electricity Board is available in Latehar district HQ. It is proposed to extended power line to Tubed Block Mine from which required power can be drawn for operating the mine.

3.10 Workshop & Store

In this project, provisions have been made for maintenance and repair of HEMM, LMV and other Plant & Machineries. Accordingly, workshop and stores to cater for the needs of their repairs and maintenance have been considered. The HEMM workshop area is ''approximately 3094 m^2 with 3 numbers of repair bay and 2 numbers of parking bay,

electrical and mechanical repair shop, open ground for repair of buckets and other parts of excavators, washing station and crane park. The LMV workshop with an approximate area of 532 m^2 will consists LMV wash station repair shop office etc. The store area is estimated at 2616 m^2 and consists of open and closed store with office and other facilities. The buildings are envisaged to be of structural steel construction with RCC foundation with 22G CGI sheeting on roof and 24G CGl sheeting as side cladding, cubicles for shop in charge small toilet facility, cage Iadder for access to roof etc.

3.11 Coal Handling & Dispatch System

The DVC intends to lay Railway siding right up to the mine so that coal movement, to the maximum extent possible, is done through railway right from the pit top.

The railway track will be connected to Latehar and Demu which is about 20 km from the lease area.

3.12 Civil Construction

Before the opening up of the mine for production certain infrastructural and coal handling facilities are to be developed. The estimate project Life include two year which includes land acquisition, clearance from MOEF and six months of construction period. The period also includes the time required for excavation of diversion nala, construction of safety embankment, and rehabilitation of villages along with the construction and development of other infrastructural facilities.

The road passing through the mining block is likely to interfere with the mining activity. Hence, it is suggested to suitably divert the road outside the mining area, Proposed Tubed block is about12 km east from Latehar town and connected to the same. Some welfare and community facilities Like College, High Schools, Cinema Halls, etc. are available in the surrounding areas and hence these have not been considered for this project.

BUILDINGS

Facilities like restrooms offices, workshop & stores, sub-station & first aid center, vocational training center, fire brigade, fuel delivery station, administrative block have been envisaged.

OFFICES

Office building has been considered as RCC - cum -brick masonry. Structure with floor area of an approximate 600 m^2, toilet drainage etc. are included.

Roads & Culverts

Colony Road

The length of roads including culverts inside the township has been estimated as 1.6 km.

Haul Road

The length of haul road including culverts has been estimated as 3.0 km.

Approach Road to Project

Provision for 1.0 km. long approach road to project has been made.

Approach Road to Colony

The length of approach road to Colony has been estimated as 2.0 km.

Approach Road to Magazine

Provision for 2.0 km. long approach road to magazine has been made.

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