



BHARAT COKING COAL LIMITED

(A Subsidiary of Coal India Limited)

FEASIBILITY REPORT

OF

NICHITPUR OPEN CAST MINE

NORMATIVE CAPACITY : 0.60 MTY
PEAK CAPACITY : 0.78 MTY

November' 2010

CLUSTER V

Scheme/ Feasibility report for Production programme of Nichitpur Open Cast Mine

1.0 INTRODUCTION

The Nichitpur Colliery consists of opencast working spread in two patches, namely, Patch –I and Patch –II .

Location

Nichitpur opencast mine operating under Sijua Area of BCCL, comprises parts of pure Nichitpur and Khas Bansjora collieries and the mine is located about 10 kms west of Dhanbad town and falls in North-Central part of Jharia Coalfield.

The latitude and longitude of the mine is 23° 47' 30" to 23° 48' 30" N and 86° 20' 40" to 86° 22' 00" E respectively.

As per the planning requirements, the following limits have been considered for assessment of this Mine Plan.

North	:	Non Coal bearing area
South	:	Sendra Bansjora Colliery
East	:	East Bassuriya Colliery
West	:	Tetulmari Colliery.

The leasehold area of the mine is 150.00 Ha. The lease of the mine is in name of Nichitpur UG Mine which is now closed. Mining operation started before 1940. The OCP started in 1982. The present operating parameters of the mine are as follows:

- Present production (2009-10)
 - coal – 643472Te.
 - O.B. - 1614974 cu.mt.
- Base seam being worked : II seam for patch II and IV seam for patch I
- Method : Shovel-Dumper Combination(Departmental)
- Present S.R. 1 : 2.51

2.0 GEOLOGY OF THE AREA

- 8 No. of Bore Holes drilled in the leasehold area with density (bh/sq.Km)
= 5.33 Bhs Sq/Km

- Seam, sequence, thickness and parting

Seams & Partings	Thickness Range (In Meter)	Grade	Gradient
VIIIA	2.21	W-IV	1 in 5
P	2.74		
VIII	6.04	W-IV	1 in 5
P	21.19		
VII	3.28	W-IV	1 in 5
P	6.71		
V/VI	9.14	W-IV	1 in 5
P	19.51		
IV	11.28	D	1 in 5
P	33.57		
III	3.96	D	1 in 5
P	22.56		
II	9.14	D	1 in 5

- Faults

There is 48 m upthrow fault at the South end of the leasehold.

- Details of Geological Reserve: 11.387 Million Te.
- Seams considered for future production

Seam	Av. Thickness(m)	Gradient	Quality	Geo. Reserve(Mte)#
VIIIA	2.21	1 in 5	W-IV	0.145
VIII	6.04	1 in 5	W-IV	0.580
VII	3.28	1 in 5	W-IV	0.551
V/VI	9.14	1 in 5	W-IV	0.756
IV	11.28	1 in 5	D	0.896
III	3.96	1 in 5	W-IV (P)	1.812

II	9.14	1 in 5	W-IV	5.764
Total	45.05			10.504

3.0 Present Status of Working

3.1 Status of seam

Seams	Status	Depth surface(m) Min.	from Max.	Thickness (m)	Fire	Water-logged
VIIIA	Exhausted	2	14	2.21	NIL	-
VIII	Exhausted	2	20	6.04		-
VII	Outcrop quarried. Developed in part and SOP . Dip side Virgin	2	44	3.28	NIL	NIL
V/VI	Outcrop quarried. Mostly developed and depillared(Caving) . Small area SOP on the east.	3	60	9.14	NIL	NIL
IV	Outcrop quarried. Mostly developed and west side depillared(Caving) . East side SOP.	3	90	11.28	Nil	Waterlogged.
III	Outcrop quarried. Mostly developed and small patches depillared(Caving) . Mostly SOP.	2	127	3.96	NIL	Waterlogged
II	Outcrop quarried. Mostly developed and SOP. Dip side virgin.	3	150	9.14	NIL	Waterlogged

SOP: Standing on Pillars

- 3.2 Opencast Mine started since 1982. At present Patch –I is being worked with IV seam as base and Patch - II is being worked with II seam as base seam with shovel dumper combination departmentally. Present production of coal is 0.705 Million Te. & O.B. 1.74 M/Cu.m with Striping Ratio 1 : 2.46. Present system of O.B dumping is internal dumping(backfilling of IV seam and II seam floor in Patch – I and Patch –II

respectively). Present depth for Patch –I is 41 m. and for Patch –II is 58 m. Thickness of Top soil varies from 2m to 8 m. Height & width of the O.B. benches are 10 m & 20 m. respectively and for coal are 6 – 9 m & 10 m. respectively. Type of blasting – Deep hole blasting, and control blasting. Amount of explosive consumption/day is 2.83 te/day & type is - SMS

3.3 Details of machinery available at surface, at face, for transportation and others is as follows:

Sl. No.	Particulars	Existing (Nos.)
A.	EXCAVATORS	
1.	Elec. Rope Shovel 4.6 m ³	1
2.	Elec. Rope Shovel 5.0 m ³	2
3.	Hyd. Shovel 1.70 m ³	(1 transferred to TOCP on 25.7.09)
4.	Hyd. Shovel 3.2 m ³	1
5.	2.7 m ³ Hyd. Shovel (CK-300D)	2
6.	Tata Hitachi 1.7 m ³	(1 returned to SBOCP on 29.7.09)
		6
B.	DUMPERS	
1.	Rear Dumper 35 Te.	20
C.	DRILLS	
1.	250 mm Drill	(Absolute)
2.	160 mm Drill	2
3.	100 mm Drill	2
	Total	4
D.	DOZERS	
1.	Dozer 320 HP	5
E.	Others	
1.	Water sprinkler	2
F.	Grader	
1.	Grader	1
G.	CRANES	
1.	32 Te.	1
H	Mobile van	
1.	Service van	1

3.4 The year wise production of coal during the last five years from the opencast along with O.B excavation and stripping ratio is given in the table below :

Years	Departmental Operation		
	Coal Prodn. (mt)	O.B. Excavn. (Mm ³)	S. Ratio (m ³ /t)
1993-94	0.273	0.321	1.17
2005-06	0.623	1.45	2.33
2006-07	0.694	1.59	2.29
2007-08	0.705	1.74	2.46
2008-09	0.684	1.55	2.27
2009-10	0.643	1.64	2.51

3.5 Present Linkage of Coal:

At present, coal production from this opencast is linked to Power houses & BRK. Coal is transported from Dump side to CHP(near patch – II) contractually and from CHP to Sendra Bansjora and Gopal Gareria siding contractually and the existing linkage will continue. The coal transport from mine to dump is by departmental dumpers.

There are four coal stock yards as follows:

I) Dump No 10 II) Dump No 10A III) S.B Siding IV) G.G. Siding.

The dumps are located within the quarry at different locations. Quantity wise coal transportation by road and rail is 71057 Te. and 548283Te. respectively.

3.6 Existing Mine / System Capacity

The existing mine / system capacity on the basis of annual productivity of existing excavators and transporting equipment is as follows :

Sl. No.	Existing Equipment	Annual Productivity / eqpt. (Mm ³)	No. of Equipment (No.)	Total Annual Capacity (Mm ³)
A.	Excavation Capacity			
1.	5.0 m ³ Rope Shovel (with RD – 35 t.) (full cap.)	0.688	2	1.376

Sl. No.	Existing Equipment	Annual Productivity / eqpt. (Mm ³)	No. of Equipment (No.)	Total Annual Capacity (Mm ³)
2.	4.6 m ³ Rope Shovel (with RD – 35 t.) Surveyed off half cap.	0.344	1	0.344
3.	4.6 m ³ Rope Shovel (with RD – 35 t.) Surveyed off Half cap.	0.344	1	0.344
4	3.2 m ³ hyd. Shovel (CK 300) (Prod. 0.740*0.8 Mm ³)	0.592	1	0.592
5	2.8 m ³ hyd. Shovel (CK 300)	0.432	1	0.432
6	1.7 m ³ hyd.shovel (Ex 300) – used for mine development work only	0.140	1	0.140
	Total		6	3.088
B.	Transportation Capacity (Av. Lead –2.00 Km.)			
1.	Rear Dumper 35 t. (with all the above Shovels)	0.123	27	3.321
	Total		27	3.321
C.	Mine / System Capacity (Mm³ / Year)			3.088

3.7 Present Pumping Arrangement:

- Make of water : Monsoon - 1200 GPM, Lean period -800 GPM
- Installed capacity of main pumps discharging water to surface: 1600 GPM
- Quantity of water being discharged to surface: 1000 GPM
- Point of discharge of water: I) Sump and Pond
- Use of discharged water (Quantity wise):
 - i) Domestic(Non-Drinking) -- 30% : 300 GPM
 - ii) Industrial --20% : 200 GPM
 - iii) Drain through settling pond - 50% :500 GPM
- Quantity of water discharged/ day from work shop/CHP : NIL

The mine water is allowed to settle in sumps before discharge to surface.

3.8 Present Power Supply:

- Source : 11 KV, Regional Sub-station at Sendra Bansjora
- Installed capacity of transformers : 12580 KVA

- Spare capacity : Nil

3.9 Details of Existing Workshop & Store:

The existing opencast has an unit workshop having sufficient facilities to cater the routine need of repair / maintenance of HEMM envisaged for the proposed mining plan.

3.10 Present Use of Land (Entire Lease Area) Quantity wise.

SL no.	TYPE OF LAND USE		Area (Ha)
1	Running quarry	Backfilled	41.39
		Not back filled	26.34
2	Abandoned quarry	Back filled	0.58
		Not back filled	0
3	External OB dump		1.73
4	Service Building/ Mine Infrastructure		2.62
5	Coal dump		4.05
6	Road & Rail		6.39
7	Homestead land	BCCL	3.04
		Private	4.78
8	Agriculture land		1
9	Forest land		0
10	Plantation		13.02
11	Water body		0.44
12	Barren Land		44.62
	TOTAL		150

3.11 Present Manpower with housing facilities:

Manpower : 750

Housing : 276

3.12 Magazine:

It is located in 0.5 Km. West of the Nichitpur Township, 1.5 Km East of Tetulmari Colliery (Subhash Chowk) having capacity of 3625 Kg. Explosives and 2000 Nos. Detonator and having area 1500 Sq. mtr.

3.13 Quantity Diesel/Petrol etc being used per day and maximum quantity stored at a time

Diesel used per day : 5100 Litres

Maximum stored a time : 20 K.L.

3.14 Infrastructural facilities available (Road, water supply etc.)

Following Infrastructure facilities exist in the leasehold:

- DB Road (Bansjora – Bhuli)
- Water Storage Tank of MADA(GoJ), 30K Gallon approx.
- Water Supply pipeline of mine.

3.15 Existing effluent treatment plant & sewage treatment plant (Mine & Colony) with quantity per month

Mine water discharged after primary settling at sump. Colony sewage treated in soak pits and ash dumped in old quarries.

3.16 Location of Hospital, School, habitation & their distance from the mine :

- Primary School (GoJ) is within 1Km. from Colliery Office
- Quarters and Bungalows
- Bansjora Basti
- Two workshops

4.0 Proposal for future production programme:

4.1 Seam proposed to be worked in future with base – II seam

- Technology : Shovel dumper combination
- Mineable Reserve available : 6.405 M.Te
- Total OB: 27.5
- Avg SR: 1:4.5

- Present Depth:
- Maximum Depth: 150 m
- Seam wise quality

Seam	Thickness	Gradient	Mineable Reserve	Grade
VIIIA/VIII	2.21/6.04	1 in 5	0.495	W-IV
VII	3.28	1 in 5	0.417	W-IV
V/VI	9.14	1 in 5	0.495	W-IV
IV	11.28	1 in 5	0.435	W-IV (P)
III	3.96	1 in 5	1.085	W-IV
II	9.14	1 in 5	3.478	W-IV

- Technology : Shovel dumper combination
- Mineable Reserve available : 6.405 M.Te
- Total OB: 27.5
- Avg SR: 1:4.29
- Present Depth:
- Maximum Depth: 150 m
- Mining : Departmental
- Existing Mine Capacity/System Capacity : 3.08 M. cu.m/year
- Proposed production capacity : 3.088 M. cu.m/year.
- Proposed production of coal & OB for next five years

The normative target production of the mine will be 0.6 MTY. However, the peak capacity of the mine will be 0.78 MTY which may be achieved occasionally by better utilization of resources and favourable geomining condition. The proposed production programme is shown below:

Year	Coal Production (mt)	O.B Excavation (Mm ³)	Stripping Ratio (m ³ /t)
1 st	0.60	2.0	3.33
2 nd	0.60	2.0	3.33
3 rd	0.60	2.0	3.33
4 th	0.60	2.0	3.33
5 th	0.60	2.0	3.33

- Thickness of Top soil : 2mt to 8 mt
- Ultimate depth : 150 mt. (Minimum depth 2 mtr. from surface)
- Seam wise minimum depth, maximum depth

Shown in table below:

Seams	Depth from surface	
	<u>Min.</u>	<u>Max.</u>
VIIIA	2	14
VIII	2	20
VII	2	44
V/VI	3	60
IV	3	90
III	2	127
II	3	150

- Thickness of Top soil : 3mt to 4 mt, Avg. 3.5m
- Life of the mine : 11 years.

The present life is based on extraction of reserve available in the area free of surface structures, habitation sites , private property , DB Road,etc. The quarry can have extended life if the surface is made free of structures(both public and private) and habitation and DB Road is diverted. The details of shifting, rehabilitation and diversion has not been considered entirely in this Scheme restricting the life to 10 years only.

- Total OB to be Handled : 27.50 M. cu.m

The summary of coal and OB for the entire mine is given below:

Seam	Coal(Mte)		O.B (Mm ³)	
	Geol. Reserve	Mineable reserve	Total OB	Actual OB
VIII/VIIIA	0.725	0.495	2.017	1.507
VII	0.551	0.417	2.428	1.828
V/VI	0.756	0.495	0.793	0.568
IV	0.896	0.435	2.100	0.992
III	1.812	1.084	16.812	11.938
II	5.764	3.477	13.706	10.667
Total	10.504	6.403	37.856	27.500

- Proposed place of OB dump : Internal dumping will be done on de-coaled quarry floor of IV/II seam in Patches I and II respectively
- Height & Width of the bench in OB -- 10 m and 20.0 m respectively.

Coal -- 6.0-9.0 mt and 10.0 mt respectively.

- Type of Blasting to be adopted : Blasting is done with SMS explosive in deep hole blasting
- Amount of Explosive consumption : 3.0 Te/day. (Type SMS)
- Requirement of HEMM : No additional HEMM proposed.
- Transport of coal & OB : As existing.

5.0 MINE INFRASTRUCTURE

5.1 Workshop & Store

The existing workshop and store is proposed to be shifted. It is also proposed to construct a new workshop cum store near mine office.

5.2 Pumping arrangement

One additional submersible pump of 500 GPM to be installed for dewatering of III seam.. The installed capacities of main pumps and their discharge to surface in the proposed stage is as follows:

- Make of water : Monsoon - 1500 GPM, Lean period -1000 GPM
- Installed capacity of main pumps discharging water to surface: 2100 GPM
- Quantity of water being discharged to surface: 1400 GPM
- Point of discharge of water: I) Sump and Pond
- Use of discharged water (Quantity wise):
 - iv) Domestic(Non-Drinking) : 400 GPM
 - v) Industrial : 200 GPM
 - vi) Drain through settling pond :800 GPM (finally to Nagri jore)
- Quantity of water discharged/ day from work shop/CHP : NIL

The mine water is allowed to settle in sumps before discharge to surface

5.3 Surface transport of coal

The coal production from this opencast would continue to be linked to Power houses & BRK. Sendra Bansjora which supplies power to Nichitpur OC. Coal is being transported from the mine dump to Sendra Bansjora CHP to S/Bansjora / Gopal Gareria siding contractually. The coal transport from mine to dump would continue by departmental dumpers.

5.4 Power supply

Power is being supplied to Nichitpur from R/S Sendra Bansjora. The average annual power consumption of Nichitpur OCP is 9.93 MKWH.

5.5 Pumping

As covered in para 5.2

5.6 Proposed Power supply

As covered in para 5.4

5.7 Diversion of road, jore, nallah OH transmission line

A seasonal drain no. 2 is proposed to be diverted departmentally.

6.0 LAND

- Requirement of land for OB dump, for Quarry, for other purposes, for the balance life of the mine to achieve the proposed production (type/category wise)

Land required for excavation --- 33.00 Ha.

- Land available with BCCL and land to be purchased (Private & Forest)

Land available with BCCL : 31.18 Ha.

Land to be purchased (Private & forest) : Private land --- 1.82 Ha.

6.1 Land acquisition status of forest & non-forest land

- Forest land clearance status
No forest land in the leasehold.
- Diversion of road, surface water course, transmission line etc.
No land required.

6.2 Proposed land used (Quantity wise)

SL no.	TYPE OF LAND USE		Area (Ha)
1	Running quarry	Backfilled	9.39
		Not back filled	9.00
2	Abandoned quarry	Back filled	0.00

SL no.	TYPE OF LAND USE		Area (Ha)
		Not back filled	0.00
3	External OB dump		0.00
4	Service Building/ Mine Infrastructure		2.62
5	Coal dump		4.05
6	Road & Rail		6.39
7	Homestead land	BCCL	3.04
		Private	2.96
8	Agriculture land		1.00
9	Forest land		0.00
10	Plantation		97.67
11	Water body		0.44
12	Barren Land		13.44
	TOTAL		150

7.0 Civil Construction work, if any

- Construction of OCP workshop
- Diversion of drain (to be done departmentally)

8.0 Rehabilitation, if any (No. of villages and persons involved, place where to be rehabilitated, R&R package to be offered) :

181 nos. of private unauthorized houses are proposed to be dismantled. Rehabilitation package as stipulated by R&R Policy of CIL will be provided .

9.0 Status of community development work undertaken with their detail :

Community Development Programme has been taken up by this project to provide healthcare, education, water supply to the village community living around the project and to develop a feeling of co-existence. The various schemes undertaken are:-

- i) Construction of Roads, etc. with facility of street lighting

Kutcha and pucca roads will be provided to adjoining villages along with drainage facilities. Free electricity will be provided through arrangement of street lighting through the project to the village community around this project.

ii) Health Care

As part of health care, children's health, immunisation programmes are being taken up regularly at certain intervals for the children living in the nearby Area level. Doses of Triple Antigen, Polio drops, ECG, Measles, Tetanus Toxoid are being given to the children through Regional Hospital, Katras. In addition, Family Planning camps are regularly organized to educate villagers in Family Planning Techniques. Voluntary organizations are encouraged to organize free Eye Operation Camps and also to supply Artificial limbs to disabled persons.

iii) Water Supply

To provide drinking water facility necessary hand pumps and sufficient number of taps will be installed in different villages in and around the buffer zone of the project.

iv) Service in villages

To provide recreation in villages, the management will provide sports and recreational materials like football, volleyball, carrom-board, etc. to a number of villagers.

V) Educational Facilities

School facilities like Primary Schools, Middle Schools, High Schools are existing in the adjacent villages..

In addition to the above, some more community development programs are being covered from BCCL Headquarters, Dhanbad.

10.0 Environmental Measures being taken presently and proposed to be taken, Mine Closure :

TECHNICAL ASPECT

Management of pit slope and waste dump

The operating, pit slope of the individual benches shall be maintained at 70° which will be finally reduced to 45°, so that there is no chance of failure of slope.

During operation, the external and internal OB dump will be developed with 40 m berm width and maximum height of 60m from surface in case of internal OB dump.

However, the external dump has been planned for a maximum height of 90m. The waste dumps will be provided with the wall and garland drains. The dump will be technically reclaimed and vegetation will be grown after spreading the top soil. The above measures will prevent slope failure and improve the aesthetic value.

Management of hydrology and hydrogeology

Mining operation may lower the water table of the area. To recharge the water table, it is proposed that the mine water during operation will be discharged into the nearby wells and ponds. The mine water also proposed to be distributed to the nearby habitants. About 2/3rd of the excavated area will be backfilled during operation. The backfilled area will be dozed and vegetation will be grown. The surface slope shall be developed in a manner so that the surface rainwater is channelised towards the eastern corner of the mine.

Decommissioning of infrastructures

The following infrastructures already exist in the mine.

- Unit Workshop
- Store
- Site Office
- Sub-Station
- Magazine House

These infrastructures are proposed to be decommissioned after the mining operation is over.

ENVIRONMENTAL ASPECT

Management of Final Voids

During operation, entire O.B will be backfilled. After complete extraction of estimated reserve, the backfilled O.B above surface level will be spread towards the left out voids including the access trench filling the access trench upto the surface level so that the entry to the quarry may be closed and filling of end trench to max. extent. The internal OB dump shall be properly graded, dozed, compacted and the land will be used for vegetation. A portion of the final void that will be left is proposed to be filled with water to make fishing spot. The water filled final void will be properly fenced for prevention of thorough approach.

Management of Recharge Areas

In the pre-mining scenario, the hydro-geological recharge is through the rain water and mine water discharge. During mining, the mine water will be discharged to the nearby ponds, wells etc. in order to maintain the water table. In post-mining scenario. The part of the land will be restored to its original position restoring the

pre-mining scenario. The rain water will be accumulated on the south-western corner of the mine which will recharge the water table.

Acceptable Surface and Ground water flows

In post-mining scenario, there will be no discharge of mine water, as the final void will be filled and reclaimed and water lagoons will be created. However, during mining, the mine water shall be discharged to surface water sources after proper treatment if found acidic or having presence of toxic material.

Alternative use of land

After completion of mining activities, the quarried area shall be reclaimed and shall be utilized for vegetation.

SOCIAL ASPECTS

Redeployment of Work Force

After closure of the mine, the work force will be re-deployed in other mines of BCCL.

Management of Community Facilities

Community facilities like health center, school, community hall, canteen, guest house etc. are available at the Area level, catering a number of mines. The above facilities at the Area level is proposed to be utilized for the project also. Thus even after closure of the mine, the community facilities will be utilized for other mine / project of the Area.

Channelisation of available water

Part of the void created due to mining after closure will be backfilled and reclaimed and no water from the quarried area will flow into the surface water courses. In fact, the surface rain water falling within the quarry area will be accumulated in the south-western corner of the mine. The rainwater out side the quarry area will be channelised to near by surface drainage system.

FINANCIAL ASPECTS

CREATION OF A CORPUS FUND FOR THE FINAL MINE CLOSURE

The final mine closure cost will be Rs. 6.00 lakh per Hectare of the mine leasehold area(for underground mines) and will be met from the fund deposited in the corpus Escrow Account deposited by the mine operator. The said amount shall be considered in the revenue expenses . However, the additional amount

beyond the Escrow Account will be provided by the mine operator after estimating the final mine closure cost five years prior to the mine closure.

RAIN WATER HARVESTING SYSTEM

Water harvesting is a deliberate collection and storage of rainwater that runs off on natural and man-made catchments area. The amount of water harvested such depends on the frequency and intensity of the rain fall and characteristics of the catchments to allow the precipitate to infiltrate through the sub-soil and percolate down to recharge aquifers.

It is therefore proposed that during mining operation the rain water within the quarried area will be accumulated in the dip most portion and it will be pumped out into earthen water pool developed on the surface which will not only be helpful in re-charging the ground water of the area but will fulfill the non-drinking water demand of near by inhabitants also.

In order to prevent the erosion of soil and gully formation on the OB dump it is proposed that soil bond will be created along its periphery through its height at a regular interval so that rain water during precipitation is held up and given adequate time to infiltrate into the soil strata of the OB dump on way to its percolation down ground aquifer. Such act of retention of the rainwater of OB dump will also facilitate enhancement of moisture in the soil and its retention capacity, which ultimately will help in the biological reclamation of OB dump.

9.0 Manpower requirement in the proposed stage : 728

10.0 Item wise capital investment required to achieve the proposed production:

Sl .No.	Capital Items	Amount in Rs. Lakhs
1	Workshop Construction for OCP	20.50
2	Land Acquisition (1.82 Ha Private land) for excavation	108.00
3	R & R Package for 181 no. of houses	25.00
4	Shifting of weigh bridge	05.00
5	Submersible Pump, 600 GPM, 200m head, 10" dia	27.00
6.	Diversion of drain no. 2 in Patch - II	05.00
7.	Constn. of 3 nos. of Hume pipe culvert in proposed drain no.2	03.00
8.	VCB, 11 KV, 400 A complete installation with bus connections (NPC Main S/S)	0.65
9.	New (Standby) P/Transformer 1000 KVA, 11 KV/3.3KV. One s with primary & secondary switch installation (with E.pits)	1.00
10.	Haul road lighting complete with all fittings & OB dump lighting (new line) complete with all fittings.	5.25
11.	Diversion of 440 V, 3-ph/4-wire system (WS)	1.70
12	Diversion of 3.3 KV, OH line of NPC (OCP)	2.40

13.	11 KV, OCB installation at S/Stn. with BUS completing	0.50
14.	Tower (MAST) lighting with all fittings (F.B. sites) + sidings & sidings lighting.	8.00
	Total.	213.00

11.0 Cost & Profitability – Present & Proposed.

Sl.No	Particular	Unit	Present (09-10)	Proposed
1	Production	MTe	0.643	0.625
2	Cost of production	Rs./Te	1138.18	1119.84
3	Sale Price	Rs./Te	1342.37	1194.49
4	Profitability	Rs./Te	204.19	74.65



BHARAT COKING COAL LIMITED

(A Subsidiary of Coal India Limited)

FEASIBILITY REPORT

OF

EAST BASURIA COLLIERY

(OPENCAST MINE)

NORMATIVE CAPACITY : 1.50 MTY

PEAK CAPACITY : 1.95 MTY

January '2011

CLUSTER VI

Scheme/ Feasibility report for Production programme of East Basuria Colliery (Opencast Mine).

1. Location

- East Basuria Colliery is situated 6 km from Dhanbad Railway station westwards.
- Longitude - 86°21'50"E to 86°22'30"E
- Latitude - 23° 47'30"N to 23° 48'15"N
- Survey of India topo sheet no – 73/I/5,I/6,I/9
- Elevation above mean sea level is 214.46m
- Leasehold area of the mine- 141.07 ha.
- Open cast patch lies within the leasehold area of the mine.
- Mining operation in the mine started prior to nationalisation.
- Production in 1993-94 – 13,639 T.
- Production in 2009-10 – NIL.
- Base seam being extracted - II seam
- Method of mining- Opencast mining with shovel/dumper combination.
- Present stripping ratio -1:3

2. Geology of the area.

- Nos. of boreholes drilled in the lease hold area is 37 with a borehole density of 4.09 Bhs/sq. km.

Details of Inclines / Shafts

Sl No	Incline/ Pit No.	Location	Connected up to	Surface R.L.	Approx Co-ordinate		Present Condition	Remarks
					N	E		
1	3/2 Incline	Near Cap Lamp Room.	2 seam B	217.45	107863.76	87918.11	Working Haulage Incline	
2	3A/2 Incline	Near Cap Lamp Room.	2 seam B		107818.46	87859.44	Travelling Incline	
3	4/2 Incline	Near Cap Lamp Room.	2 seam Top		107796.00	87870.00	Abandoned	
4	4A/2 pit/ Incline	In the west of football ground – dia 3 M	2 seam B	214.36	107850.00	87676.00	Working	Fan drift
5	8/3 Incline	Near No. 5 colony. North of DB Road	3seam	214.44	107732.00	87630.00	No Working	Pumping

6	8A/3 Incline	Near No. 5 colony South of DB Road	3seam	213.46	107722.0 0	87580. 00	No Working	Fan drift
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Seam Status

All the seams from II seam to VIII seam is outcropping within the leasehold of the mine. The status of seams is as under:-

Seam/P arting	Thick (M)	Geo. Res. (MT)	Grade	Status of workings
Parting	1.99	=		Shale parting.
VIII SEAM	7.20	2.89	W-IV	East Basuria section quarried out in rise side, dip side developed in two sections, & partly depillared. Rise side quarried out in Tickmani & Central Garraria section, Which is under active fire. Gopal Garraria section developed in two sections below Garraria village and standing on pillars are not approachable.
Parting	16.49			Stone parting.
VII SEAM	1.98	0.94	W-IV	No workings in East Basuria section & Garraria section quarried out & under active fire.
Parting	4.48			Stone parting.
V/VI SEAM	9.45	2.66	W-IV	East Basuria section developed & depillared in two sections & quarried out. Garreria section developed in two sections and standing on pillars. Rise side workings quarried out and under active fire.
Parting	17.90			Stone parting
IV SEAM	9.57	6.31	"C"	Developed in two sections along roof & floor up to southern boundary. East Basuria section depillared by caving method & rise side quarried out. Garreria section standing on pillars & waterlogged, workings are not approachable.
Parting	44.44			Stone parting
III SEAM	3.66	3.86	"C"	Developed up to 9 M down throw fault. Depillaring with caving method done in East Basuria section. Below 9 M down throw, development not done due to waterlog in IV seam. In north part of East Basuria section development not done due to depillaring done in II seam before development in III seam where quarry is being done presently.
Parting	25.30			Stone parting
II SEAM	10.29	9.85	"C "	Developed in two sections up to 41th level & standing on pillars. In the North-East and North-West, depillaring was done before nationalization. An open cast project is being done departmentally. Total coal estimated in the patch is about 7.5 lakh ton with stripping ratio 1:4. Pumping in II seam is going on for domestic use in the mine as well as in the Bhuli township.

- Two faults are passing along southern boundary of an arc 9 M down the property with throws of 40.85m and 20 m respectively.
- Total geological reserve- 24.95 MT.(II to VIII seam)
- Seams considered for future production – II to VIII seams

Sl. No.	Seam	Av. Thickness(m)	Quality	Gradient	Geo. Reserve (MT)
1	II	10.29	C	1 in 5	9.85
2	III	3.66	C	1 in 6	3.86
3	IV	9.57	C	1 in 6	6.31
4	V/VI	9.45	W IV	1 in 6	1.65
5	VII	1.98	W IV	1 in 6	0.39
6	VIII	7.20	Not known	1 in 7.5	2.89
Total					24.95

3. Present status of mining

Presently being excavated by OCP method in II & III seam.

3.1 Seam wise status of workings

SI	Seam	Present status
1.	VIII	Developed, partly depillared and rest standing on pillars and waterlogged in dip-side, rise-side under active fire.
2.	VII	20% developed and quarried out, rise side under active fire.
3.	V/VI	80% developed and partly depillared. Waterlogged in dip-side, rise-side quarried out and under active fire.
4.	IV	90% developed and partly depillared. Waterlogged and unapproachable.
5	III	70% developed, partly depillared, rise-side quarried out and being worked by OCP.
6.	II	70% developed, partly depillared, rise-side quarried out and being worked by OCP.

3.2 Mine started prior to nationalization.

- Base seam being worked - II seam.
- Technology-HEMM with shovel-dumper combination
- Present production of coal 1.00 lakh te and OB 3.00 lakhs m3 (10-11)
- Present stripping ratio 1:3.
- Present system of OB dumping- at decoaled area where II seam(base seam) has already been extracted.
- Present depth 20.0 - 30.0 m.

- Thickness of top soil-Minimum-3.00m, Maximum-3.50m, Average-3.17m.
- Height and width of the bench in OB- 10.0m and 12.0m respectively.
- Height and width of the bench in Coal-6.0m and 12.0m respectively are being maintained.
- Deep hole blasting being adopted.
- Amount of explosive consumption 700 kg/ day.
- Type of explosive used - SMS and LDE.

3.3 Details of machinery available (At surface, at face, for transportation, etc)

The following HEMM and equipments are deployed at present :

Sl. No.	Particulars	On Roll (No.)	Type
A.	EXCAVATORS		
1.	Hydraulic Shovel 2.45 m ³	1	Diesel
B.	DUMPERS		
1.	Rear Dumper 35 T.	6	Diesel
C.	DRILLS		
1.	160 mm Drill	1	Diesel
2.	100 mm Drill	1	Diesel
	Total	2	Diesel
D.	DOZERS		
1.	Dozer 155 HP	3	Diesel
	Total	1	Diesel
E.	WATER SPRINKLERS		
1.	28 Kl.	1	Diesel
	Total	1	Diesel
F.	CRANES		
1.	8 T.	1	Diesel
	Total	1	Diesel

3.4 Production of coal in 1993-94 and during last 5 years :

Year	Coal production (MT)
1993-94	0.014
2005-06	Nil
2006-07	0.094
2007-08	Nil
2008-09	Nil
2009-10	NIL

3.5 Present linkage of coal

The coal is linked to power sector and cokeries. The coal is dispatched departmentally as well as contractually to KDS-II siding for onward supply to thermal power / Fertilizer). A CHP is installed at the siding. The supply to cokeries is by road.

3.6 Existing mine capacity along with excavation capacity and transport capacity

1.00 lakhs te/year coal and 3.0 lakhs m³ of OB. O.B will be excavated in benches after proper drilling & blasting. Drilling in OB benches will be done by 100 mm & 160 mm drills. Blasted O.B will be transported by hydraulic Shovel-dumper combination.

Average stripping ratio – 1:3

Lead – OB – 0 to 1 Km

Coal – 0 to 1 KM

3.7 Present pumping arrangement

- Make of water -
 - Monsoon - 8640 KLD
 - Lean period - 2160 KLD
- Installed capacity of main pumps discharging water of surface – 2160 KLD
- Quantity of water being discharged to surface – 1100 KLD
- Point of discharge of water- II seam pump reservoir near II seam & BTA Pond
- Use of discharge of water (Quantity wise)
 - i) Industrial use - 325 KLD
 - ii) Domestic use - 250 KLD
 - iii) Discharge to Ekra Jore - 100 KLD
 - Total - 675 KLD**
- Quantity of water discharged / day from workshop/ CHP – Nil
- Total pumping hours/day- 05 hours.

3.8 Present power supply

- Source, installed capacity of transformer - DVC to Godhar Sub-station and thereafter to the mine by overhead 11K.V. line.
- Installed capacity of transformers: 1500 KVA
- Spare capacity – NIL
- Requirement of power at mine site - 2000 KVA.
- Requirement of power at township - 1000 KVA,
- Total Electrical energy consumption/ yr: - 5.7 MKWH

3.9 Details of existing workshop and store

One workshop and one store are existing near office. The workshop is used for routine maintenance and repair of machines. The store is used for storing materials related with production processes.

3.10 Present use of land (entire lease area)

Sl.No.	Type of land use		Present mining land use (in Ha)
1	Running Quarry	Backfilled	6.00
		Not Backfilled	1.46
2	Abandoned Quarry	Backfilled	17.54
		Not Backfilled	10.00
3	External OB dump		0.00
4	Service building/ Mine Infrastructure		6.3
5	Coal dump		1.00
6	Road and rail		18.58
7	Homestead Land	BCCL	6.00
		Pvt	7.94
8	Agricultural Land		0
9	Forest Land		0
10	Plantation		10.00
11	Water Body		16.07
12	Barren Land		40.18
	Total		141.07

3.11 Present Manpower with housing facilities

Present manpower 160 and they have been provided housing facility as follows:

- i) Company's quarter = 102
- ii) Own arrangement = 58

3.12 Magazine

There is one magazine in the leasehold. Its capacity is 710 kg of explosive. Plinth area of magazine – 300 sq.ft. The balance requirement of explosive is arranged at site by SMS Mobile Plant.

3.13 Quantity Diesel/Petrol etc being used per day and maximum stored at a time - 650 ltrs /Day diesel only. Maximum qty. stored at a time 800 ltrs.

3.14 Infrastructural facilities available

Katcha and Pucca Roads exist within the leasehold.

3.15 Existing effluent treatment plant & sewage treatment plant

- Domestic sewage is soaked into soak pits. Domestic waste of households is being dealt as per Municipal Solid Waste (Management and Handling) Rules, 2000.
- Mine water discharged after initial settling at sump.
- Burnt oil, grease, old batteries of HEMM is being disposed off as per Hazardous Wastes (Management and Handling) Rules, 1989.

3.16 Location of Hospital, School, habitation and their distance from the mine

Particulars	Name	Distance from mine
Hospital	East Bassuria Dispensary	200m
School	Government High & Middle & Primary School, at East Basuria Colliery	200m
Habitation sites	4 No Colony	500m
	5 No colony	150m
	7 No colony	500m

4.0 Proposal for future production programme

4.1 The details are as follows:

Proposed place for OB dumping:-

Internal dump volume = 6.4 Mm³

External dump volume = nil

Minimum depth of OCP = 3m

Maximum depth of OCP = 160m

Average S R = 4.27

Thickness of top soil = 3 to 4 m

Height of bench – Coal – 6 m OB – 10 m.

Width of bench - Coal – 12 m OB - 12 m

Details of HEMM – as given in point no. 3.2

4.2 Seams proposed to be worked in future-II seam to VIII seam.

- Technology- Shovel Dumper combination.
- Mineable reserve available- 12.42 MT.
- Quality of coal- Grade “C” / W-IV.
- Proposed stripping ratio - 1 :4.27
- Proposed production capacity- 15 lakhs te of coal and 64 lakhs m³ of OB.

The normative target production of the mine will be 1.50 MTY. However , the peak capacity of the mine will be 1.95 MTY which may be achieved occasionally by better utilization of resources and favourable geominig conditions. **Life of the mine will be 10 years.** The entire production will be contractual.

The running OCP will be extended further dip side. Future production for the next 5 years is given below–

Year	Coal Prodn. (T)	OB Prodn. (m3)	Striping Ratio
2010-11	1,00,000	3,00,000	3.00
2011-12	3,00,000	10,00,000	3.30
2012-13	100000	330000	3.30
2013-14	120000	396000	3.30
2014-15	150000	510000	3.40
Total	370000	1236000	

- Life of the mine at the proposed production -10 years.
- Proposed place of OB dumping-Backfilling/Internal dumping
- Ultimate depth of the project - 160 m.
- Seam thickness given below:

Sl. No.	Seam	Thickness(M)
1	VIII	7.2
2	VII	1.98
3	V/VI	9.45
4	IV	9.57
5	III	3.60
6	II	10.29
	Total	42.09

- Thickness of top soil-3.0m, 3.5m, 3.17m.(Min, Max, Avg.)
- Height and width of bench in OB- 10.0m and 12.0m respectively.
- Height and width of bench in coal- 6.0m and 12 m respectively.
- Blasting procedure to be followed-Deep hole blasting to be adopted.
- Quantity of explosive consumption/day - Approx 2100 kg/day consumption.
- Type of explosive to be used - SMS and LDE.
- Requirement of HEMM: As the entire operation would be departmentally.
- We need 3 nos of loading M/C of high capacity, 10 nos of Dumpers, 2 nos of 160 mm Drill M/C, 2 nos of Dozers.

5.0 Mine infrastructure

5.1 Workshop and store

The existing workshop and store would be shifted in non-coal-bearing areas.

5.2 Proposed pumping arrangement

No additional pumps are proposed to be installed at the mine. The existing pumping arrangements would continue.

- Nos. of Pump (surface 4 & UG 1) – 5 nos.
- Capacity of pumps - total 1100 GPM (2160 KLD)
- Running hours per day – 12 hours.

- Total Discharge - 4665.6 KLD
- Point of Discharge - Surface Pond near cap lamp room.
- Uses of mine water -
 - i) Industrial use - 325 KLD
 - ii) Domestic use - 250 KLD
 - iii) Discharge to Ekra Jore – 100 KLD
 - Total - 675 KLD**
- Mine water is being discharged into BTa pond for domestic use.

5.3 Proposed surface transport of coal

The coal transportation from proposed OCP shall be done contractually to KDS-II siding.

5.4 Proposed Power supply

The existing power supply comes from DVC through Godhar Electric sub-station and thereby to EBC mine through 11KV line.

The present annual power consumption is 5.7 MKWH.

5.5 Proposed pumping arrangement

As covered in para 5.2

5.6 Proposed power supply, additional load, source

As covered in para 5.4

- 5.7** Proposal for diversion of road, mullah, river, OH transmission line and other infrastructures to be diverted or created –
 Bhuli - Loyabad road to be diverted partly (0.5 Km) over company's land.

.6.0 Land

Requirement of land for OB dump for quarry for other purposes for the balance life of the mine to achieve the proposed production (type / category wise) :

Land available with BCCL and land to be purchased (Private & Forest) -
 Land available with BCCL – 139.07 ha. About 131 Ha of land is required for quarry extension of which 2 Ha private land to be purchased from private dwellers.

6.1 Land acquisition status of forest and non-forest land.

- Forest land clearance status :
 Diversion of road, surface water course, transmission line etc: Bhuli - Loyabad road to be diverted partly approx half KM on company's land.

Post Mining Land Use

SL no.	TYPE OF LAND USE		Post Mining Land Use (Ha)
1	Running quarry	Backfilled	0.00
		Not back filled	0.00
2	Abandoned quarry	Back filled	0.00
		Not back filled	0.00
3	External OB dump		0.00
4	Service Building/ Mine Infrastructure		0.00
5	Coal dump		0.00
6	Road & Rail		1.58
7	Homestead land	BCCL	2.00
		Private	2
8	Agriculture land		0
9	Forest land		0
10	Plantation		79.99
11	Water body		46
12	Barren Land		9.5
	TOTAL		141.07

7.0 Civil Construction work :

Service outfit requirement for OCP under construction.

8.0 Rehabilitation if any (No. of villages and persons involved, place where to be rehabilitated, R & R package to be offered):

East Basuria market consisting of about 30 houses and about 25 shops are to be rehabilitated. CIL's R&R Policy will be followed for their rehabilitation and resettlement.

Gareria Basti, 229 houses (encroachers) to be shifted & it has been taken under MASTER PLAN.

9.0 Status of community development work undertaken with their detail –

Community facilities like health center, school, community hall, canteen, guest house etc. are available at the Area level, catering a number of mines. The above facilities at the Area level are proposed to be utilized for the project also. Thus even after closure of the mine, the community facilities will be utilized for

other mine / project of the Area. Community Development Programme will be taken by this project to provide health care, education, water supply to the village community living around the project and to develop a feeling of co-existence. The various schemes undertaken are:-

- i) Construction of Roads, Nallas etc. with facility of street lighting
Katcha and Pucca Roads will be provided to adjoining villages alongwith drainage facilities. Free electricity will be provided through arrangement of street lighting through the project to the village community around this project.
- ii) Health Care
As part of health care, children's health immunization programme is being taken up regularly at certain intervals for the children living in the nearby villages by Area level. Dose of Triple Antigen, Polio drops, ECG, Measles, Tetanus Toxide are being given to the children through Regional Hospital, Bhuli. In addition, family planning camps are regularly organized to educate the villagers in the Family Planning Techniques. Voluntary organizations are encouraged to organize free eye operation camps, to supply artificial limbs to disabled persons.
- iii) Drinking water
To provide drinking water facility necessary hand pumps and sufficient no. of taps will be installed in different villages in an around the buffer zone of the project.
In addition to this some wells and tanks will also be constructed by the management in the adjacent villages of the project.
- iv) Service in Villages
To provide recreation in the villages, the management will provide sports and recreational materials like football, volleyball, carom board etc. to number of villages.
- v) Educational Facilities
School facilities like Primary School, Middle School, High School are existing in the adjacent villages which will be rehabilitated.
- vi) Self-employment Scheme
Under this scheme project will provide some Sewing Machines to villagers to impart training and tailoring to the unemployed youths and villages women folk.
In addition to above, some more community development programme are being already covered centrally from BCCL, HQ.

10.0 Environmental measures being taken and proposed to be taken & Mine closure plan-

TECHNICAL ASPECT

Safety hazards including management of fire and subsidence

The upper seam is affected by fire near Gareria basti rendering the area unstable. The fire will be dealt with in due course of excavation with continued quenching operation. Adequate provision of water has been kept to deal with the fire.

The internal OB dump shall be dozed and sloped and the final void that will be left is proposed to be filled with water to make fishing spot.

Management of pit slope and waste dump

The operating, pit slope of the individual benches shall be maintained at 70° which will be finally reduced to 45°, so that there is no chance of failure of slope.

During operation, internal OB dump will be developed with 40 m berm width and maximum height of 60m from surface in case of internal OB dump.. The waste dumps will be provided with the wall and garland drains. The dump will be technically reclaimed and vegetation will be grown after spreading the top soil. The above measures will prevent slope failure and improve the aesthetic value.

Management of hydrology and hydrogeology

Mining operation may lower the water table of the area. To recharge the water table, it is proposed that the mine water during operation will be discharged into the nearby wells and ponds. The mine water also proposed to be distributed to the nearby habitants. About 2/3rd of the excavated area will be backfilled during operation. The backfilled area will be dozed and vegetation will be grown. The surface slope shall be developed in a manner so that the surface rainwater is channelized towards the eastern corner of the mine.

Decommissioning of infrastructures

The following infrastructures already exist in the mine.

- Unit Workshop
- Store
- Site Office
- Sub-Station
- Magazine House

These infrastructures are proposed to be utilized for underground mining in future.

ENVIRONMENTAL ASPECT

Management of Final Voids

During operation, total O.B will be backfilled. After complete extraction of estimated reserve, the backfilled O.B above surface level will be spread towards the left out voids including the access trench filling the access trench upto the surface level so that the entry to the quarry may be closed and filling of end trench to max. extent. The internal OB dump shall be properly graded, dozed, compacted and the land will be used for vegetation. A portion of the final void that will be left is proposed to be filled with water to make fishing spot. The water filled final void will be properly fenced for prevention of thorough approach.

Management of Recharge Areas

In the pre-mining scenario, the hydro-geological recharge is through the rain water and mine water discharge. During mining, the mine water will be discharged to the nearby ponds, wells etc. in order to maintain the water table. In post-mining scenario. The part of the land will be restored to its original position restoring the pre-mining scenario. The rain water will be accumulated on the south-western corner of the mine which will recharge the water table.

Acceptable Surface and Ground water flows

In post-mining scenario, there will be no discharge of mine water, as the final void will be filled and reclaimed and water lagoons will be created. However, during mining, the mine water shall be discharged to surface water sources after proper treatment if found acidic or having presence of toxic material.

Alternative use of land

After completion of mining activities, the quarried area shall be reclaimed and shall be utilized for vegetation.

SOCIAL ASPECTS

Redeployment of Work Force

After closure of the mine, the work force will be re-deployed in other mines of BCCL..

The houses rendered unstable due to fire at Gareria Basti will be rehabilitated in accordance with Jharia Action Plan.

Management of Community Facilities

Community facilities like health center, school, community hall, canteen, guest house etc. are available at the Area level, catering a number of mines. The above facilities at the Area level is proposed to be utilized for the project also. Thus even after closure of the mine, the community facilities will be utilized for other mine / project of the Area.

Channelisation of available water

Part of the void created due to mining after closure will be backfilled and reclaimed and no water from the quarried area will flow into the surface water courses. In fact, the surface rain water falling within the quarry area will be accumulated in the south-western corner of the mine. The rainwater out side the quarry area will be channelised to near by surface drainage system.

FINANCIAL ASPECTS

CREATION OF A CORPUS FUND FOR THE FINAL MINE CLOSURE

The final mine closure cost will be Rs. 6.00 lakh per Hectare of the mine leasehold area(for underground mines) and will be met from the fund deposited in the corpus Escrow Account deposited by the mine operator. The said amount shall be considered in the revenue expenses . However, the additional amount beyond the Escrow Account will be provided by the mine operator after estimating the final mine closure cost five years prior to the mine

RAIN WATER HARVESTING SYSTEM

Water harvesting is a deliberate collection and storage of rainwater that runs off on natural and man-made catchments area. The amount of water harvested such depends on the frequency and intensity of the rain fall and characteristics of the catchments to allow the precipitate to infiltrate through the sub-soil and percolate down to recharge aquifers.

It is therefore proposed that during mining operation the rain water within the quarried area will be accumulated in the dip most portion and it will be pumped out into earthen water pool developed on the surface which will not only be helpful in re-charging the ground water of the area bout will fulfill the non-drinking water demand of near by inhabitants also.

In order to prevent the erosion of soil and gully formation on the OB dump it is proposed that soil bond will be created along its periphery through its height at a regular interval so that rain water during precipitation is held up and given adequate time to infiltrate into the soil strata of the OB dump on way to its percolation down ground aquifer. Such act of retention of the rainwater of OB dump will also facilitate enhancement of moisture in the soil and its retention capacity, which ultimately will help in the biological reclamation of OB dump.

11.0 Manpower requirement in the proposed stage

A total of 300 persons would be required.

12.0 Item wise capital investment required to achieve the proposed production

The OCP patch has been operated by departmental HEMM. As such, a 16 crore capital investment would be required for HEMM.

13.0 Cost & Profitability of the mine (present and proposed)

Parameter	Unit	10-11	11-12	12-13
CPT	Rs/te	Rs 125.11	Rs 125.11	Rs 125.11
Sale Value	Rs/te	Rs 990.92	Rs 990.92	Rs 990.92
Profit/te	Rs/te	Rs 865.81	Rs 865.81	Rs 865.81
Annual Profit	Rs in Crs.	Rs 51.95	Rs 69.26	Rs 69.26

Proposed cost and profitability will remain same because production cost escalation has been estimated at the same ratio as escalation of sale price of coal over the years.

Data Required:

1. Coal Ttransport route to be marked on the plan. : AS marked in the plan
2. Lead of coal & OB
3. Proposed OMS.: 3.0
4. Present status of 14.36 Ha land claimed by the forest dept. It is to be marked on the plan.: As shown in the plan
5. Location of the houses to be rehabilitated and to be marked on the plan. Location of the rehab sites to be marked , site name to be given if land/ houses provided.: As shown in the plan.
6. Running Quarry Void: Mm³ : 1 lakh cum
7. Old Quarry Void: Mm³ : As shown in the plan
8. External OB: Mm³: Nil
9. Additional Land required for quarry Extention:
 - i) Land in Possession with BCCL:
 - ii) State Govt Land:
 - III) Rly Land:
 - IV) Private Land:
 - a) Homestead Land:
 - b) Barren Land:
 - c) Others:

East Bassuriya Colliery : Data Required:

9. Additional Land required for quarry Extention: 119 Ha
- i) Land in Possession with BCCL:
 - ii) State Govt Land: 4.08
 - III) Rly Land: 14.5 Ha
 - IV) Private Land:7.94
 - d) Homestead Land:6.13 Ha
 - e) Barren Land:1.81 Ha
 - f) Others: nil