PRE-FEASIBILITY REPORT OF BPA OPENCAST-II EXPANSION PROJECT CAPACITY EXPANSION

1. EXECUTIVE SUMMARY:

1. Name of the Project : **BPA OPENCAST-II EXPANSION PROJECT**
2. Type of the project : Opencast
3. Name of the organization : The Singareni Collieries Company Ltd.
4. Location.
   - Village : Abbapur
   - Mandal : Tandur
   - District : Komaram Bheem Asifabad and Mancherial
   - State : Telangana
   - Coal Belt : Dorli-Bellampalli Coal Belt
   - Coal Field : Godavari Valley Coal Field
5. Latitudes : 19^0 12'34" to 19^0 12'56"
6. Longitudes : 79^0 20'53" to 79^0 21'41"
7. Details of coal linkage : SCCL is doing commercial mining and supply the coal to the consumers as per the allotment of the MOC for power, cement, steel utilities through fuel supply agreements.
8. Cost of the project : Rs.79.03 Crores
9. Reserves

Description	As per FR-2003	Present Proposal
Geological Reserves (Mt) (Block-C, B.Ext. & D)	7.69	7.69
Extractable Reserves (Mt) (Block-C, B.Ext. & D)	7.00	6.80*
Total Overburden (M.Cu.M) (Block-C, B.Ext. & D)	45.51	41.47*
Average Stripping Ratio (tones/Cum)	6.50	6.10
Coal already extracted up to 2016-17. (Mt)	-	2.80
OB already extracted up to 2016-17. (M.Cu.M)	-	13.33
Balance extractable reserves in Mt	-	4.00
Balance OB to be removed in M.Cu.M	-	28.14
Average Stripping Ratio (tones/Cum) for balance reserves	-	7.03
OB to be re-handled (Block-D) (M.Cum)	0.3	0.3
Production Capacity (MTPA)	0.4	1.0
Life of the Project (years)	18	4 (Balance life)
Area of Excavation (Ha)	90.51	90.51

*Note: In the actual operations to prevent sliding of the benches due to the presence of fault, DGMS authorities advised to change the bench configuration (height/width) and as such the top two benches configuration (height/width) changed

from 10m/10m to 5m/15m. As a result the extractable reserves are estimated at 6.80 Mt with corresponding reduction of OB of 41.17 M.Cum.

10. Borehole density : 36.46 No's/Sq.km
11. Land requirement :191.98 Ha
    - i) Forest land : 137.40 Ha
    - ii) Non- forest land : 54.58 Ha
12. Technology : Shovel-Dumper combination
13. Maximum depth of the quarry : Block-C (115m), Block-B Ext. (100m), Block-D (130m)
14. Production capacity : Expansion from 0.4 MTPA to 1.0 MTPA
15. R&R involved : R&R package for 146 no. of families of Abbapur & Sonapur Villages is under process.
16. Date of Board approval : 29.12.2003 (For 0.4 MTPA) & 4.11.2016 (for 1.00 MTPA)
17. Date of ground water clearance : 24.03.2005
18. Date of approval of mining plan : 03.07.2006 (0.4 MTPA) & 26.07.2016 (for 1.0 MTPA)

19. Any river/Nallah flowing near the project: There are three nallahs flowing across the project area i.e., Narsapur nallah (Block-C), a Nallah on the western side of the Block-B Ext. and Sonapur nallah (Block-D). The Narsapur nallah was already diverted before starting of the coal extraction in the Block-C. The other two nallahs are to be diverted.

20. Diversion of Roads if any: **Block-C:** A road, Connecting Goleti town ship to Madaram, was passing across the Block-C was diverted along the northern periphery of the Block -C before the commencement of mining operations.

    Block-B Ext: A public road to Bejjala village is passing in the western periphery of the Block-B Extension. The diversion of road along the western side of the quarry is under progress. The length of the diversion is 2.3 Km.

2. INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION:

i. Identification of the project and project proponent. In case of mining project, a copy of mining lease / letter of intent should be given

The BPA OC-II Expansion project is located in the northern part of the Dorli-Bellampalli coal-belt beside Goleti-1 Incline in the Godavari Valley Coalfield. It is partly located in Komaram Bheem Asifabad district and Mancherial district of Telangana State. It lies between East longitude $79^0$20'53" to $79^0$21'41" and North Latitude $19^0$12'34" to $19^0$12'56" and falls in the Survey of India Toposheet No. 56m/8. This project is a part of Bellampalli group of coal mines. The BPA OC-II Expansion Project is covered in the Tandur Mining Lease.

Project Proponent.

The Singareni Collieries Company Limited is a coal mining company owned jointly by the State and Central Governments.

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Director (Planning & Projects)
The Singareni Collieries Company Limited
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Dist: Bhadradri Kothagudem, Telangana
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ii. Brief description of the nature of the project

BPA OC-II expansion project (consisting of Block-C, Block-B Ext & Block-D) is an existing Opencast Coal Mine belonging to the Singareni Collieries Company Limited. The BPA OC-II expansion project envisages day lighting of the underground mines namely MVK-6 Incline and Goleti-2 Incline. The entire MVK-6 underground mine was planned to be extracted by opencast as Block-A, B, C and B Extension. In MVK-6 block the opencast mining operations are completed in Block-A, Block-B under the name of BPA OC-II and Block-C operations are completed under the name of BPA OC-II Expansion. After completion of mining operations in the Block-C in the year 2011-12, mining operations were stopped till 2016-17 due to delay in diversion of Forest land required for Block-B Ext and Block-D. Opencast operations in Block-B Extension started in the year 2016-17 after diversion of the forest land. Opencast operations are yet to commence in Block-D i.e. Goleti-2 Incline underground mine. So far 2.80 MT of coal and 13.33 M.Cum of OB was extracted from Block-C and Block-B Extension. The mining operations in Block-D would commence after completion of mining operations in Block-B extension.

Feasibility Report of BPA Opencast-II Extension Project was approved for a rated capacity of 0.4 MTPA vide minute no: 460.41 of Board of directors meeting held on 29.12.2003. The salient features of the approved FR-2003 are as follows:

S.No.	Parameter	Details
1	Total mineable coal (Mt)	7.00
2	Total Over Burden (M cu m)	45.51
3	Average Stripping Ratio	6.5
4	Rated Capacity (MTPA)	0.4
5	Life of the project (Years)	18
6	Grade of the Coal	F
7	Capital (Rs.crores)	35.51
8	OB extraction	Hired HEMM
9	Coal extraction	Departmental

Environmental Clearance for this project was issued by MOEF, GOI vide Lr. No. J-11015/147/2005-1A-.II (M) dated.11.09.2006 for a rated capacity of 0.40 MTPA.

It was proposed to extract the coal from three blocks through separate pits. Accordingly, the coal production started in 2006 from Block-C. The extraction of total coal (2.40 Mt) from Block-C was completed by removing 9.61 M.Cum of OB and the project was stopped on 09.08.2011 due to delay in diversion of forest land required for Block-B extension and Block-D. In the year 2016-17 mining operations is Block-B extension were started after diversion of forest land. Till the end of the year 2016-17, 2.80 Mt of coal is extracted from the project by removing 13.33 M.Cum of OB. Presently mining operations are in progress in Block-B extension.

Forest clearance for diversion of 28.62 Ha of Forest land has been obtained Vide Ref. F.No. F(C)A/16.174/AP/MIN dated 06.07.2006.

Forest clearance for the remaining area of 108.78 Ha is obtained vide Ref. F.No. 8-21/2009-FC, dated 04.09.2014.

Present proposal

Keeping in view of the increase in demand in the SCCL command area and limited scope for enhancing production in the short run, it is proposed to enhance the capacities of presently operating opencast mines to their optimum levels with short gestation.

BPA OC-II Expansion project is one of such projects wherein the potential rated production capacity can be enhanced from 0.4 MTPA to 1.0 MTPA with minimum additional facilities and with short gestation.

In the present proposal the area of excavation remained unchanged. The coal and OB extracted up to 31.03.2016 was 2.80 Mt and 13.33 M.Cum respectively. The balance extractable coal reserves are 4.00 Mt with corresponding OB of 28.14 M.Cum. The average stripping ratio for the balance life of the Project is estimated at 7.03. The total OB, includes loose OB of a quantity 0.30 M.Cum is to be re-handled from the Block-D.

The year wise production since inception is as follows:

S.No	Year	Coal(MT)	OB (M. Cum)	SR(Cum/T)
1	2006-07	0.40	1.48	3.70
2	2007-08	0.40	3.00	7.50
3	2008-09	0.40	2.50	6.25
4	2009-10	0.40	1.43	3.57
5	2010-11	0.40	0.67	1.67
6	2011-12	0.40	0.53	1.32
7	2012-13	Not in operation due to delay in diversion of Forest land to an extent of 108.78 Ha.		
8	2013-14			
9	2014-15			
10	2015-16			
11	2016-17	0.40	3.72	9.30
	Total	**2.80**	**13.33**	**4.76**

iii. Need for the project and its importance to the country and or region

Coal is the most important and abundant fossil fuel in India. It accounts for 56.42% (Source: Ministry of Power, GoI) of the country's energy need. Considering the limited reserve potentiality of petroleum & natural gas, eco-conservation restriction on Hydel project and geo-political perception of nuclear power, coal will continue to occupy centre-stage of India's energy scenario. As per the working group of Ministry of Coal, Government of India, a supply gap of about 265.50 million tones is forecasted by the terminal year of 12th Five Year Plan i.e. 2016-17. Even the increase in production is considered in optimistic scenario the gap of 185.50 MT will still be left by terminal year of 12th Five Year Plan.

SCCL, being the only coal producing company in Southern India, has the onerous responsibility of meeting large portion of coal demand in this part of the country. Further, there is need for enhancement in coal production to meet the requirement of Telangana State in particular and India in general. Further, Telangana State is planning to add 10,480MW capacity by setting up new power plants within 3 years. In order to fulfill coal requirement of future thermal power projects of Telangana State and Southern India SCCL is taking following steps:

1) Reconstruction of existing mines for optimum production by intermediate and high technology.
2) Improving the productivity in the existing mines by improving the utilization of the equipment.
3) Opening of new mines in the adjoining/superjacent areas/seams for higher production.
4) Adopting opencast method of mining wherever possible for high rate of production.
5) Conversion of shallow underground workings to opencast method for extraction of balance coal reserves.

6) Extension of the existing opencast workings to further dip side upto optimum level.

In this context, viability of enhancement of production of existing BPA Opencast-II Expansion Project is examined and found amenable for enhancement. As such proposal for enhancing the capacity from 04.00MTPA to 1.00 MTPA and implementation of R&R of Abbapur and Sonapur villages was approved by Board of SCCL in its meeting held on 4.11.2016, Minute No: 537:5:3 with an additional funds of Rs.40.04 Crores. The BPA Opencast-II Expansion Project will supplement up to 1.0 Mt to reduce the gap without increase in ML area.

iv. Demand-Supply gap

SCCL is the only coal mining company existing in Southern India and supplying coal to the major power utilities of NTPC, TSGENCO, APGENCO, KPCL and Maha GENCO. During the financial year 2016-17, SCCL has supplied 49.72 Mt of coal to power utilities against 45.61 MTPA of FSA quantities. Apart from power utilities, 9.28MT coal was supplied to Cement, Captive Power Plants, Heavy Water Plant and other consumers through fuel supply agreements during 2016-17. Further, SCCL supplied coal to small and medium scale sector units to the extent of 1.82 MT. Total coal supplied to above-mentioned customers by SCCL during 2016-17 was 60.83 MT.

After bifurcation of Andhra Pradesh State, Telangana State has become power-Deficit State. To overcome the power deficit, Government of Telangana has embarked on an action plan for capacity addition of around 10,480 MW. SCCL has also constructed a power plant of 1200 MW capacity in Srirampur area. Further, NTPC also has the mandate as per AP Re-organization Act to set up 4000 MW Thermal Power Plant in Telangana State. With the addition of new power plants, there will be an additional demand for SCCL coal over and above the existing supplies. Therefore, SCCL, being a state-owned public sector company, has the responsibility to cater to the needs of the new power plants coming up in the State. The demand details in **MT** under various heads for 2017-18 are as furnished below.

Linked Power Demand	-	31.20
Bridge Linkage	-	26.00
Linked Non-Power demand	-	26.58
Upcoming Power plants demand	-	15.00
Total Demand	**-**	**98.78**

Considering the likely expansion of existing power projects and construction of new power units, the production and demand gap will further increase.

v. Imports vs. Indigenous production

Certain quantity of coal is being imported to mitigate demand-supply gap in the country. In order to reduce the imports and to increase the production capacities, it is proposed to increase the capacity of the BPA Opencast-II Expansion Project.

vi. Export possibility

There is no possibility of export of coal from this mine as there is sufficient demand for industries located in the region and also elsewhere in Telangana and India.

vii. Domestic / export markets

The coal produced is fed to the major domestic customers such as Power sector, Cement industries, fertilizers, brick industries etc.

viii. Employment generation (Direct and Indirect) due to the project:

This is an existing project, which is considered for further production enhancement. Due to opening of this project direct employment was generated in the company for working various operations in the mine. The total man on roll required in this project is 265.

Apart from the direct employment, Indirect employment may also be generated to lot many in the form of Coal transportation, supply of raw material like fly ash bricks, general conveyance of persons to the mine from their location by means of hired vehicles, housekeeping, out sourced OB removal etc.

3. PROJECT DESCRIPTION:

i. Type of project including interlinked and interdependent projects, if any.

The project is independent and not interlinked or interdependent on any project for its production enhancement.

ii. Location (map showing general location, specific location, and project Boundary & project site layout) with coordinates

The BPA.OC-II Expansion is located in the northern part of the Dorli-Bellampalli coal-belt besides Goleti-1 Incline in the Godavari Valley Coalfield. It is partly located in Komaram Bheem Asifabad district and partly in Mancherial district of Telangana. It lies between East longitude $79^0$20'53" to $79^0$21'41" and North Latitude $19^0$12'34" to $19^0$12'56" and falls in the Survey of India Toposheet No. 56M/8.

Note: The Location Plan and Key Plan of the area are shown in Plate No: I & II.

iii. Details of alternate sites considered and the basis of selecting the proposed Site, particularly the environmental considerations should be highlighted

As the mining is site specific in nature and production enhancement is planned in the existing mine alone.

iv. Size or magnitude of operation

The mine is proposed to operate with production capacity of 1.0 MTPA. The physical parameters of BPA.OC-II Expansion Project capacity expansion are furnished below:

Sl. No.	*Particulars*	*Block-C*	*Block-B Extn*	*Block-D*
a	Maximum strike length along surface (m)	350	1100	1300
b	Maximum strike length along floor (m)	250	880	1000
c	Maximum width of the quarry along surface (m)	770	400	425
d	Maximum width of the quarry along floor (m)	740	310	290
e	Minimum depth of the quarry (m)	15	10	8
f	Maximum depth of the quarry (m)	115	100	130
g	Floor area of quarry (Ha.)	12.2	21.43	22.0
h	Area of excavation on surface (Ha.)	21.81	28.06	40.64
i	Average gradient of the seam	3.5 to 4.0	3.2 to 4.0	3.17 to 4.4

v. Project description with process details (a schematic diagram/ flow chart showing the project layout, components of the project etc. should be given)

The project is a coal producing unit referred to as an Opencast Coal mine. The coal produced is brought to surface and dispatched to identified customers namely Power houses, Cement industries, fertilizer industries, and other coal based industries.

The components of the project are:

Under the prevailing geo-mining conditions, it is proposed to mine the property using shovel-dumper combination, which is considered to be most suitable method of opencast mining.

The method of work with Shovel-dumper Mining comprises of –

- Removal of topsoil.
- Removal of OB to expose the coal seam.
- Excavation of coal.

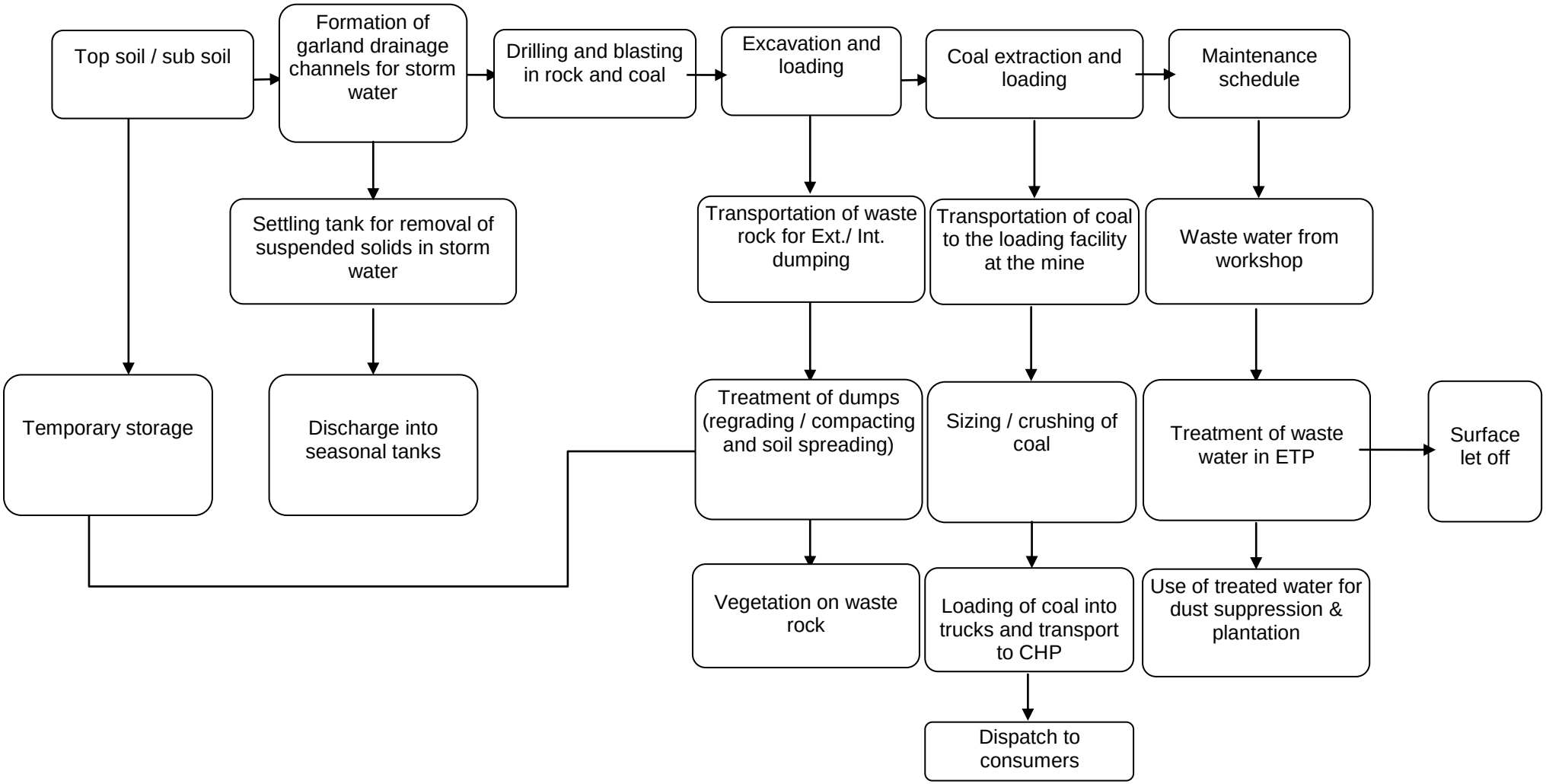
The activities involved in the Process are:

- Drilling & Blasting.
- Haul roads formation.
- OB removal.
- Transportation of coal from face to surface Crushers by means of dumpers.
- Transportation of coal from pit head to CHP and then to consumers by trucks.
- Pumping operations etc

All the mining operations are done under the Supervision of Mining / Mechanical staff as per the Mines Act.

MINE DEVELOPMENT AND COAL EXTRACTION PROCESS CHART

BPA OPENCAST-II EXPANSION PROJECT



vi. Raw material required along with estimated quantity, likely source, marketing area of final product, mode of transport of raw material and finished product.

Raw Material Required along with estimated quantity per annum:

Material	Existing	Additional	Total	Source
Explosives	1400 T	2692 T	4092 T	Purchasing From Explosive companies
Diesel Oil	2810 KL	5374 KL	8184 KL	Purchasing From Oil companies

Mode of Transportation of Raw Material:

- Explosives will be transported in Explosive Vans Approved by the Chief controller of Explosives
- Diesel oil will be transported to Company Established Oil Bunks at site through approved Oil Company Lorries.

Marketing area of final product:

- The coal is supplied to the major customers like Powerhouses, Cement, Textiles, Paper, Railways, and other coal based industries.

Mode of Transportation of Finished Product (Coal):

- The coal is transported by road through trucks to consumers/CHP.

vii. Resource optimization / recycling and reuse envisaged in the Project, if any, should be briefly outlined.

Resources like Explosives, Diesel Oil, Machinery, Land, Power and Water are fully optimized to minimize unnecessary losses during the process of excavation and supply of coal to the customers.

As the coal mining process does not involve any chemical process, the excess pumping water will be used for industrial purpose such as washing, spraying and the excess water will be let out through settling tanks into nearby tanks/streams. The effluents from workshop are being treated in ETPs and waste water will be utilized for watering plantations and dust control.

viii. Availability of water, its source, Energy / Power requirement and Source should be given

- The water seepage/rain water in the mine is collected at identified sumps and is pumped to surface by means of suitable capacity of pumps. The water required for industrial purpose such as washing, spraying, etc. is met from the pumped out water.

- The source of power for the project is from 132 kV sub-station, Mandamarri. This sub-station is having sufficient spare capacity to meet the power requirement of expansion project also. One overhead transmission line of 33 KV originating from this sub-station is feeding power to BPA OC-II Expansion project.

ix. Quantity of wastes to be generated (liquid/solid) and scheme for their management/disposal

This project involves the excavation of coal from the earth crust. During the process of excavation, the superincumbent strata required to be removed and dumped in the earmarked sites as a solid waste. The wastes in the form of solid & liquid are being generated during mining activity.

Solid waste

The total extractable coal reserves in BPA OC-II Expansion project is 6.80 Mt with corresponding total OB of 41.47 M.Cum with a stripping ratio of 6.10 Cu.m/T.

Out of 41.47 M.Cum of total OB to be handled, 39.67 M.Cum is hard OB and the balance 1.80 M.Cum is topsoil. The gradient of all the blocks is more than 1 in 3.5 and the extents of all the blocks are too small to accommodate any back filling. Hence it is envisaged to accommodate most of the OB in the de-coaled pits except for a quantity of 3.60MBCM which is to be dumped in the external dump yard of Abbapur up to a height of +30m above ground level. The hard OB will be accommodated as shown in the following table:

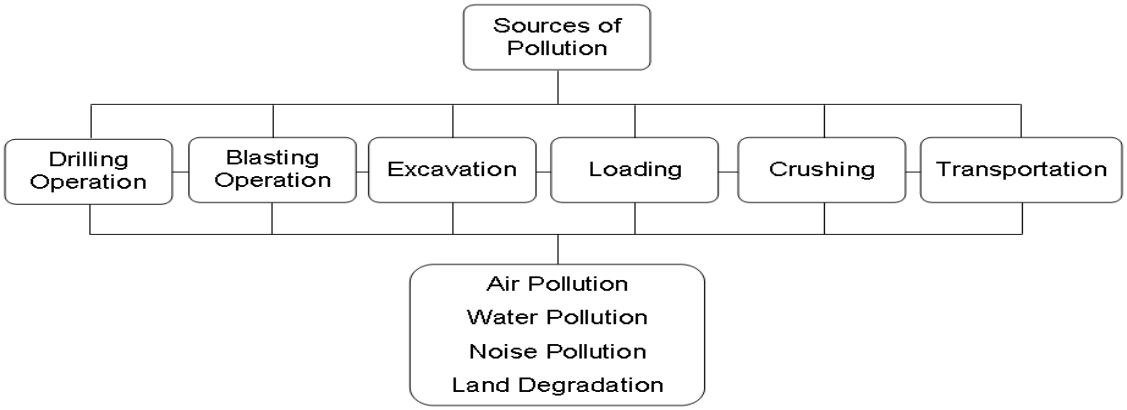
OB Dumping					
Name of the Dump yard	**Quantity Dumping**		**Excavated From**		
	H OB	**Topsoil**	**H OB**	**Topsoil**	**Total**
De-coaled area of Block-A of BPA OC-II	9.17	0.25	C	B Ext	9.42
Abbapur external dump	3.60	0.29	B Ext	B Ext	3.89
De-coaled area of Block-C	7.73	0.46	B Ext	D	8.19
De-coaled area of Block-B Ext	19.17	0.36	D	D	19.53
Dumps of Block-A & E of BPA OC-I		0.44		C	0.44
	39.67	**1.80**			**41.47**

Hazardous waste

The Hazardous waste generated in the mine like used engine oil, used gear oil, used brake oils and other lubricants are stored in separate tins/drums/cans and sent to main stores for disposal to TSPCB authorized recyclers.

x. Schematic representations of the feasibility drawing which gives information of EIA purpose.

Schematic diagram showing the activities involved in the existing project which is potential source for Air, Water and Noise pollution, Land degradation and impact on other environmental attributes are given under:



4. SITE ANALYSIS:

i. Connectivity

The nearest railhead from the project site is Rechini Road Railway Station, which is at a distance of about 13 Kms. This railway station is situated between Kazipet-Ballarshah section of South Central Railway.

The block is connected by all weather road to Bellampalli Town which is about 22Km away from the project. Bellampalli is 27 Km away from Mancherial (District Head quarters) and 278 Km away from Hyderabad (State Capital).

ii. Land form, Land use and Land ownership

The total land required for the project is 191.98 Ha. No additional land is required for the present expansion proposal of the project.

Land form:

The pre mining land form of the land required for the project is shown below:

Sl.No	Land type	Area (Ha)
1	Agricultural Land	36.33
2	Forest land	137.40
3	Waste land	8.67
4	Grazing land	5.93
5	Surface water body	3.65
Total		**191.98**

***Note:** As per the earlier approved mining plan the requirement of forest land was 117.63 Ha, but on verification of legal status of the land with forest dep., it was found that the forest land involved is 137.40 Ha. The extent of non forest land is reduced to 54.58 Ha. The total land required for the project (191.98 Ha) is not changed.

Land use:

S.No	Particulars	Forest Land	Non-forest Land	Total
1	Quarry, excavation area.	87.45	3.06	90.51
2	Safe barrier, drainage, protection bund etc	29.94	1.34	31.28
3	Dump yard including drains around the dump	0	23.81	23.81
4	Diversion of Nallah	11.95	1.57	13.52
5	diversion of public road	3.04	2.04	5.08
6	Road between Block-b ext & Block-D	1.92	0	1.92
7	CHP & ETP	3.1	0	3.1
8	R&R	0	22.76	22.76
	Total land requirement	**137.4**	**54.58**	**191.98**

Land ownership:

Block	Forest land (Ha)	Non-Forest land (Ha)	Total (Ha)
Block-B Extn.	42.84	28.56	71.40
Block-C	28.62	3.26	31.88
Block-D	65.94	22.76	88.70
Total	**137.40**	**54.58**	**191.98**

iii. Topography (along with map)

Physiography

Block-C: This block forms a part of undulatory valley lying between Madaram gutta, Bejjal gutta and Madi gutta hill ranges. The Naspur nallah forms the main drainage, traversing right across the block from south to north and north east before joining Pulikuntala nallah. This Nallah was diverted and the coal extraction in this block is completed.

Block-B Extension: This is a gently rolling plain terrain sloping towards east with the topographic elevation varying from 293.45 m above Mean Sea Level (MSL) in the north central part to 301.66 m above MSL in the western part.

Block-D: This is a high ground on its southern side sloping to the three sides. Sonapur gutta (hillock) of about 55m above ground level is located in the northeastern part of the property. The general elevation of this block varies from 245m above MSL in the northeastern part to 360m above MSL in the southeastern part.

Drainage

The area is drained by two ephemeral streams i.e., Sonapur Nallah (Block-D) and Narsapur Nallah (Block-C) flowing in a northeasterly direction. Finally, the Narsapur Nallah joins Pulikuntala Nallah. Another Nallah flows in the western position of Block-B Extn. (Besides Abbapur village). The water flows towards north and joins the Sonapur Nallah at Block-D. The basin slope of this area is about 15m/km.

Two hills Sonapur gutta (to north-east of Block-D) and Bheemanna gutta (to south-east of Block-C) influence the drainage system of the area.

Note*: The Topo plan showing the entire surface features with in 10 km radius of the project boundary is enclosed as* ***Plate No.III***

iv. Existing land use pattern (agriculture, non -agriculture, forest, water bodies(including area under CRZ)),shortest distances from the periphery of the project to periphery of the forests, national park, wild life sanctuary, eco sensitive areas, water bodies(distance from the HFL of the river).In case of industrial area, a copy of the Gazette notification should be given.

EXISTING LAND DETAILS (IN HECTARES)

This is a working project and extraction of coal from the Block-C is already completed and coal extraction in Block-B extension is under progress. The Pre-Mining land use of the project area is shown below: The plan showing the details of land requirement for the project is enclosed as Plate No:IV.

S.No	Pre-mining Land use	Area (Ha)
01	**Forest Land**	**137.40**
02	**Non-Forest Land**	
(a)	Agricultural land	36.33
(b)	Waste land	8.67
(c)	Grazing land	5.93
(d)	Surface water bodies	3.65
	Total Non Forest Land	**54.58**
	Grand Total	**191.98**

The existing project area does not fall under CRZ area. There is No National Park, Wild life sanctuary; eco sensitive area exists within 15 Km radius of the project boundary. This project falls under two forests namely Tandur and Rebbena Reserved forests.

v. Existing Infrastructure

The infrastructure existing in the mine is used for extraction and transportation of coal.

The existing infrastructure is given below:

- Office buildings/Service buildings
- Pumps of different HP & Head
- HEMM of different capacities
- Different capacities of electrical equipments.
- Source of power and existing substation
- Connecting road and communication systems
- Pit head CHP.

vi. Soil classification

The soil is mostly sandy loamy/sandy clay. The pH value ranging from 7.28 to 9.27, which indicate that the soils are alkaline in nature. The available organic matter is ranging from 0.37% to 1.2%, Phosphates content is ranging from 0.204 mg/gm to 1.147 mg/gm and potassium content is varying from 0.309 mg/gm to 2.313 mg/gm.

vii. Climatic data from secondary sources

Climate

The area experiences typical tropical climate of a distinct hot summer from March to June with occasional dust storms, a good monsoon between June and September and a pleasant winter from October to February.

Rainfall

The annual rainfall of this area monitored from 1996 to 2015 at Tiryani, the nearest gauging station, indicated the annual rainfall to vary widely from 681.1 mm (1999) to 1714.1 mm (2013) with an average of 1009.50 mm. The maximum daily rain fall during this period is 170 mm (5^{th} August 2006 & 23^{rd} July 2013) and the maximum monthly rain fall is 652.20 mm (July, 2013).

viii. Social Infrastructure available

The mining activities in the proposed project area are being carried since 1979. The social infrastructure in terms of connectivity by road and rail, communication, health, sanitation, community centers, education, financial institutions, income source, etc. are well established. Infrastructure facilities were fully developed in the area. SCCL has constructed quarters for residential accommodation of the employees employed in the mine at Goleti Town ship. The housing satisfaction of the employees is around 65%. Other facilities provided were:

- Well connected to District and State head quarters.
- Power supply network and communication network
- Hospital for necessary medical aid with specialist doctors
- Acute Medical cases referred to Super specialty hospitals by the company
- Clubs for social interactions and recreation
- Bank facility and ATM counters
- Schools for providing necessary education

- Parks for recreation
- Necessary market facilities and shops
- Provision of Super bazaar
- Supply of free LPG
- Provision of petrol through Company petrol bunk
- Sports & Cultural activities
- Encouraging Horticulture
- Promoting skills of women of the colonies through Singareni Seva Samithi
- Development of surrounding habitat through SHAPE funds

5. PLANNING BRIEF:

i. Planning concept (type of industries, facilities, transportation etc) Town and country planning / Development authority classification

Reserves in the BPA Opencast-II Expansion Project (capacity Expansion):

The coal reserves, overburden to be removed and the stripping ratio are as follows:

Particulars	Quantity
Total Mineable reserves (Mt)	6.80
Total OB (M.Cum)	41.47
Overall Stripping Ratio	6.10
Coal already extracted (Mt)	2.80
OB already removed	13.33
Bal. Mineable Reserves (Mt)	4.00
Bal. Overburden (M.Cu.m)	28.14
Bal. Stripping Ratio (Cu.m/T)	7.03

Details of coal seams:

i) BLOCK-C:

The detailed exploration in Block-C of BPA OC-II Expansion project has proved the existence of three coal horizons viz. No.2 seam, Middle seam and Bottom seams in descending order. The No.2 seam was not considered for extraction because of inferior grade of coal.

The details of workable coal seams, partings and average grade of coal seams are as indicated below:

Seam/ Sections	Thickness Range (m)	Average thickness (m)	Avg.GCV (K.cal/Kg)	Avg. Grade
Middle Seam	2.74 – 10.98	9.20	5081	G-8
Parting	3.35-13.11			
Bottom seam	1.98-5.19	4.27	5396	G-7

ii) BLOCK-B Extension:

The seam considered for extraction in the Block-B Ext. of BPA OC-II Expansion project is Middle seam. The details middle seam is given below:

Seam/ Sections	Thickness Range (m)	Average thickness (m)	Avg.GCV (K.cal/Kg)	Avg. Grade
Middle Seam	4.58-7.73	6.2	4646	G-9

iii) Block-D:

The detailed exploration in Block-D of BPA OC-II Expansion project has proved the existence of three coal horizons viz. Top seam, Middle seam and Bottom seams in descending order.

The details of workable coal seams, partings and average grade of coal seams are as indicated below:

Seam/ Sections	Thickness Range (m)	Average thickness (m)	Avg.GCV (K.cal/Kg)	Avg. Grade
Top seam	1.22-3.57	2.00	5131	G-8
Parting	1.52 - 5.48			
Middle Seam	1.07-6.55	4.00	5322	G-7
Parting	7.61 – 15.45			
Bottom seam	2.13-5.19	3.80	5071	G-8

Rated capacity and life of the project:

The rated production capacity of the project is proposed to enhance from 0.4 MTPA to 1.00 MTPA. The life of the project for the remaining coal reserves is 4 years from 2017-18.

Calendar Programme of Excavation:

The proposed enhanced capacity of 1.0 MTPA of coal will be achieved during 2017-18 and will be maintained till end of the project life i.e. 2020-21. The details pertaining to BPA OC-II Expansion Project Capacity Expansion (for balance reserves to be excavated from 2017-18 onwards) are as follows:

a) Total mineable coal : 4.00 Mt
b) Total overburden : 28.14 M.Cum.

YEAR WISE MINING SCHEDULE

	Period		Coal (Mt)	OB (M.Cum)	SR (Cum/T)
Excavated Quantities	Year	Up to 2016-17	2.80	13.33	4.76
Balance Quantity	1	2017-18	1.00	8.47	8.47
	2	2018-19	1.00	9.00	9.00
	3	2019-20	1.00	6.21	6.21
	4	2020-21	1.00	4.46	4.46
	Sub-Total		**4.00**	**28.14**	**7.03**
Grand Total			**6.80**	**41.47**	**6.10**

Method of work:

It was planned to extract the coal by opencast method of mining. Accordingly the coal extraction in the block-C was already completed. The same system is being continued for the Block-B Extension and Block-D in the present proposal of capacity expansion.

Mechanisation:

It is proposed to continue the existing Shovel-Dumper combination in the present proposal of capacity expansion also.

Equipment Deployment:

The project has started production in the year 2006-07 with 3 Cum shovel/35T dumper combination. The main HEMM projected to achieve the enhanced coal production is as follows:

SL. No.	Description	Equipment No.
A	**Coal(Departmental)**	
	3 Cum Diesel. Hyd. Backhoe	1
	35 T Dumpers	6
	160mm Diesel RBH drills	1
	320 HP Dozers	1
B	**Reclamation(Departmental)**	
	Water sprinkler (28KL)	1
	Motor Grader (145HP)	1
C	**Common(Departmental)**	
	1.0 Cum Diesel Hydraulic Excavator	1
	Loader (2.5 Cum)	1
D	**Overburden(Off-loading)**	
	By hiring of HEMM including for drilling	
	3 Cum Hyd. Backhoe	8

	18 T trucks	56
	Loader (2.6 cum)	1
	28 KL Water Tankers	3
	320 HP Dozers	6
	Motor Grader	2

CONSTRUCTION AND DEMOLITION WORKS

BPA OC-II Expansion Project is a working mine, hence the existing infrastructure facilities like service buildings, work shop, Office buildings and Sub-stations etc will serve this expansion project. No further construction or demolition of structures is required.

WASTE MANAGEMENT

Dumping Strategy (Background)

The total coal in BPA OC-II Expansion Project is 6.80 Mt and OB to be removed is 41.47 M.Cum with a stripping ratio of 6.10 cum/T from the all three blocks. Till now 2.80 Mt of coal is already extracted by removing 13.33 M.Cum of OB. The balance extractable reserves in the project are 4.00 Mt and the balance OB to be removed is 28.14 M.Cum.

Design Criteria

The following design criteria have been considered for waste dumps In order to avoid the soil erosion from the dump:

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a) External Dump

i) Height of the dump in each deck will be 30m.
ii) Width of the berms will be 30m.
iii) Dump slope in each deck will be maintained at $37\frac{1}{2}^0$ from the horizontal and overall slope of the dump is 29^0.
iv) Track dozers will be deployed for shaping the dumps
v) Maximum height of external dump is +60 m (Block-A Dump yard).

b) Internal Dump

The gradient of all the blocks is more than 1 in 3.5. The extents of all the blocks are too small to accommodate any backfilling since most of the place is consumed by haul roads. As such no internal dumping is planned. However most of the OB will be accommodated in the de-coaled voids of the adjacent pits.

Location of Dump Yards:

Block-C:

The total OB produced from the Block-C is 9.61 M.Cum, out of which 9.17 M.Cum is hard OB. The total hard OB is dumped in the de-coaled area of Block-A (BPA OC-II).

Block-B Extension:

The total hard OB from the Block-B Ext is 11.33 M.Cum. out of which It is proposed to accommodate the 7.73 M.Cum of HOB in the voids of the Block-C and 3.60 M.Cum of HOB in the Abbapur external dump yard.

Block-D:

The total hard OB from the Block-B Ext is 19.17 M.Cum (including Re-handling quantity of 0.30 M.Cum). It is proposed to accommodate the entire HOB from the Block-D in the voids of the Block-B Extn and Block-B.

Hard Overburden

The total hard OB to be produced in the project is 39.67 M.Cum (Block-C-9.17 M.Cum +Block B Ext.-11.33 M.Cum + block-D- 19.17 M.Cum). Till now 12.69 M.Cum (Block-C: 9.17 M.Cum & Block-B ext: 3.52 M.Cum) of hard OB is produced from the project. The balance hard OB to be produced will be 26.98 M.Cum. The Hard OB from the project will be accommodated in the external yards as shown below:

OB in M.Cu.m.

Location of dumping	Total Hard OB	OB already Dumped	Balance OB	Max. Dump Height(m)
Backfilled area of Block-A (BPA OC-II)	9.17	9.17	0	+60
Abbapur dump yard	3.60	0.00	3.60	+30
voids of the Block-C	7.73	3.52	4.21	0
voids of the Block-B Extn	19.17	0.00	19.17	0
Total	39.67	12.69	26.98	

Topsoil:

The total top soil to be produced from all the blocks is 1.80 M.Cum. till now 0.64 M.Cum (Block-C-0.44 M.Cum & Block-B Ext- 0.20 M.Cum) of topsoil was already produced. The top soil of Block-C was spread over the Dumps of block-E and A of BPA OC-I. The balance topsoil to be produced from the project is 1.16 M.Cum. Out of 1.36 M.Cum of topsoil 0.25 M.Cum will be spread over the Block-A dump yard of BPA OC-II, 0.29 M.Cum will be spread over the Abbapur dump yard, 0.46 M.Cum will be spread over the Block-C dump yard and the balance 0.36 M.Cum of topsoil will be spread over the B Ext. dump yard.
All the topsoil will be spread on to finished dumps directly, there will not be any temporary storage of the top soil.

Final Void

The BPA OC-II Expansion project consists of three pits namely Block-C, Block-B Ext., and Block-D. It is proposed to fill the voids of the Block-C and Block-B Extension with the OB from the Block-B Extension and Block-D respectively. Hence only the void of Block-D will be left after final operations. The maximum depth of the final void at the end of mining operations of the Block-D is 130 m. The volume of the

void is 21.52 M.Cum and covers an area of 40.64 Ha. This void will be filled up to ground level with the OB from the upcoming Goleti & Abbapur OCP which is adjacent to the BPA OC-II Expansion project. .

ii. Population projection

The average daily attendance required to achieve the rated production of 1.00 MTPA is estimated to be 212 excluding area level. After considering absenteeism towards authorized leave, sick etc., the men on roll for the project is 265 excluding Area level. Contractor manpower is not considered. The average daily production is 3030 tonnes (1.00 MTPA). The planned O.M.S. is 14.30 tonnes at 100% performance level. Presently SCCL men on roll at this project is 204 and that of out sourcing is 380.

iii. Land use planning (breakup along with green belt etc)

The land required for the project is being used for quarry, OB dumping, pit head infrastructure, approach roads, etc. but the same will be reclaimed to economic / social use. The details of land in Post Mining scenario will be as follows:
The post mining land use pattern of project area is furnished below:

The details of land in Post Mining scenario will be as follows:

Sl. No	Description	LAND USE DETAILS (Ha.)				
		Plantation	**Water body**	**Public Use**	**Other Uses**	**Total**
1	Excavation Area					
	(a) Backfilled area (Block C & B Ext.)	49.87	--	--	--	49.87
	(b) Void area left of (Block-D)	--	40.64	--	--	40.64
2	External waste dump	19.16	---	---	---	19.16
3	Diversion of Nallah	---	13.52	---	---	13.52
4	diversion of public road	---	---	5.08	---	5.08
5	Area utilized for rehabilitation and resettlement	---	---	22.76	---	22.76
6	CHP	3.1	---	---	---	3.1
7	Protective bund around quarry& dump yard, safety distance & drains	37.85	---	---	---	37.85
	TOTAL	**109.98**	**54.16**	**27.84**		**191.98**

iv. Assessment of infrastructure demand (Physical & Social)

The project is an existing project in the Bellampalli area group of mines. The Bellampalli area is having well established infrastructure such as road, rail, railway siding, CHP, Township, communication, power supply arrangements, etc.

v. Amenities/Facilities

The facilities are provided to the persons connected to mining operation whether direct or indirect are:

Residential quarters, Rest shelters for taking rest, Canteen facilities at subsidized rates, Washing/bathing facilities, provision of motor cycle/Cycle sheds, provision of drinking water points, sanitation facilities ,first aid and medical facilities etc.

6. PROPOSED INFRASTRUCTURE

i. Industrial area (Processing area)

The BPA OC-II Expansion project is having following infrastructure which will cater the needs of the expansion proposal also. There are no other infrastructures proposed presently.

- Office buildings/Service buildings
- Pumps of different HP & Head
- HEMM of different capacities
- Different capacities of electrical equipments.
- Source of power and existing substation
- Connecting road and communication systems
- Pit head CHP.

ii. Residential area (Non processing area)

No additional township is required for the expansion proposal. The existing township is sufficient to cater the needs of persons employed in the mine.

iii. Green belt

Proposed plantation details

(Within the project area)

- OB Dump(External) plantation : 19.16 Ha
- Back filled area plantation : 49.87 Ha
- Other areas : 40.95 Ha
- **Sub Total : 109.98 Ha**

Other areas

- Block-A dump yard and Block-B dump yard :59.20 ha
- **Total area : 169.18 Ha**

Till now plantation was done in an area of 28.94 Ha over the back filled area of the BPA OC-II and on the slopes of the bund along the diverted Narsapur Nallah. And it is proposed to carry out plantation as a part of Green belt development at areas along the roads, vacant lands along ML boundary and also in the township outside the lease area.

iv. Social Infrastructure

Social Infrastructure available in the area will cater the needs of the employees working in the mine. No additional social infrastructure is proposed in the project

v. Connectivity (Traffic and transportation road/ Rail/Metro/ Water ways etc)

A pit head CHP established at the Block-D is handling the coal produced from the project. Presently the coal is being transported to RKP CHP. It proposed to transport the coal by road from the pit head CHP to the Rebbena railway siding which is under construction. From there the coal will be transported to the customers by rail. The Rebbena railway siding will be completed within one year.

vi. Drinking water management (Source and Supply of water)

The water collected at identified sumps will be pumped to surface by means of suitable capacity of pumps. The water will be pumped to filter bed on surface and after treatment; it will be used for drinking purpose.

vii. Sewerage system

Presently, the sewage from the existing township and office buildings is being treated in septic tanks followed by soak pits. It is proposed to establish a STP at Goleti township to treat the sewage from the colony.

viii. Industrial waste management

The major effluent source is mine water pumped out from the mine, which is being let out into natural streams after removal of suspended solids. The other source of concern would be the domestic and service building effluents. The domestic effluent is being treated in septic tank followed by soak pits.

In the coal extraction process, coal containing impurities such as shale or sometimes sandstone is being transported to the coal handling plant. There, the shale and sand stone is being picked out manually. This solid waste is in the form of lumps.

The solid waste from the townships is being collected from the collection bins and tricycles provided by SCCL. The domestic solid waste collected is being transported to the disposal sites of SCCL. The solid waste disposal sites are identified in the low-lying areas, over burden dumps and subsidence areas of SCCL. Hence, no appreciable impact is anticipated due to disposal of solid wastes.

There is no problem for collection, handling and transport of solid wastes and there will not be any subsequent pollution of air, water and soil due to disposal or reuse of solid wastes.

ix. Solid waste management

The following design criteria have been considered for waste dumps

i) Separate spoil dumps for Topsoil and hard OB.
ii) Maximum height of Top soil dump will be 10 meters.
iii) Hard OB to be dumped in 30 m high decks.
iv) 30 m ramp width for allowing safe transport in external dumps.
v) Dump slope for each deck to be at 37 ½ ^{0} and overall slope 26.5^0
vi) Track Dozers will be deployed for shaping the dumps.

vii) The maximum dump height proposed for External dump yard will be +60m above ground level (Block-A dump yard).

The details of Hard OB and Top soil spreading on the dumps of BPA OC-II Expansion Project are indicated below:

	OB Dumping (M.cu.m)				
Dump yard	**Quantity**		**From**		
	HOB	**Topsoil**	**HOB**	**Topsoil**	**Total**
Back filled area of Block-A of BPA OC-II	9.17	0.25	C	B Ext	9.42
Abbapur external dump	3.60	0.29	B Ext	B Ext	3.89
voids of Block-C	7.73	0.46	B Ext	D	8.19
voids of Block-B Ext.	19.17	0.36	D	D	19.53
Dumps of Block E & A of BPA OC-I*		0.44		C	0.44
	39.67	**1.80**			**41.47**

x. <u>Power requirement & supply/source</u>

The source of power for the project is from 132 kV sub-station, Mandamarri. This sub-station is having sufficient spare capacity to meet the power requirement of expansion project also. One overhead transmission line of 33 KV originating from this sub-station is feeding power to BPA OC-II Expansion project.

The annual power requirement for this project is about 1.16MVA (as OB removal is by hiring HEMM, which are mainly with diesel operated equipment).

7. REHABILITATION AND RESETTLEMENT (R&R) PLAN:

Implementation of R&R package for the PDFs of Abbapur and Sonapur villages which are located on Block-B Extension and Block-D respectively is under process. The total no. of PDFs involved is 146 (Abbapur-89 & Sonapur-57). It is proposed to rehabilitate the families of Abbapur village near New Narsapur Village and the families of Sonapur near Goleti village. The estimated funds required for Implementation of R&R is Rs.18.43 Crores.

8 <u>PROJECT SCHEDULE</u>

i. Likely date of start of construction and likely date of completion(Time schedule for the project to be given)

The project was started coal production in 2006 from Block-C. Till 2016-17, 2.80 Mt of coal extracted and the balance coal to be extracted is 4.00 Mt.

The present proposal is to enhance the rated capacity from 0.4 MTPA to 1.00 MTPA. The balance life of the project is estimated as 4 years from 2017-18.

ii. **Estimated project cost along with analysis in terms of economic viability of the project.**

The total capital required for the project is Rs.79.03 Crores including the actual spent amount of Rs. 38.99 Crores. The financial IRR at 100% performance level is high positive and at 85% performance level is 71.97 as per the latest estimates done for a rated capacity of 1.00 MTPA.

9. ANALYSIS OF PROPOSAL (FINAL RECOMMENDATION):

Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.

IMPROVEMENT IN PHYSICAL INFRASTRUCTURE

This project is located in the Adilabad district of Telangana. The project is also located in an area where communications and other facilities were not developed. The following physical infrastructure facilities were further improved due to this project.

- Road Transport facilities
- Communications
- Housing facilities
- Water supply and sanitation
- Power
- Medical, Educational and social benefits will be made available to the nearby civilian population in addition to the workmen employed in the project.

IMPROVEMENT IN SOCIAL INFRASTRUCTURE

Coal mining and agriculture is the basic sector of employment for the local people in this area. This project is lead to indirect employment opportunity. Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors is primarily temporary or contractual and involvement of unskilled labor is more. A major part of this labor force is mainly from local villagers who are expected to engage themselves both in agriculture and project activities. This will enhance their income and lead to overall economic growth of the area.

The following changes in socio-economic status are expected to take place with this project.

i) The project is having a strong positive employment and income effect, both direct as well as indirect. Migrant - non-migrant ratio will shift towards migrant side because a number of people will migrate towards the central region of study circle in the years to come. This will happen because of better indirect employment opportunities due to this project.
ii) The project is going to have positive impact on consumption behavior by way of raising average consumption and income through multiplier effect.
iii) The project is going to bring about changes in the pattern of demand from food to non-food items and sufficient income is generated.

iv) People perceive that the project will help in the development of social infrastructures / such as.
- Education facilities
- Banking facilities
- Post offices and Communication facilities
- Medical facilities
- Recreation facilities
- Business establishments & Community facilities
- Plantation and parks

OTHER TANGIBLE BENEFITS

The BPA Opencast-II Expansion Project is likely to have other tangible benefits as given below.
- Indirect employment opportunities to local people in contractual works like housing construction, transportation, sanitation, for supply of goods and services to the project and other community services.
- Additional housing demand for rental accommodation will increase.
- Market and business establishment facilities will also increase.
- Cultural, recreation and aesthetic facilities will also improve.
- Improvement in communication, transport, education, community development and medical facilities.
- Overall change in employment and income opportunity.
- The State Government will also benefit directly from the proposed project, through increased revenue from royalties, excise duty and etc.

Justification
- Opencast method is a safe method of mining compared to underground method.
- The development of coalfield will provide better social and economic life to the area. It will also give a boost to the industrial activity in the area and help in creating national wealth.
- In order to meet the ever increasing coal demand, it is essential to enhance the production. The project will contribute 1.00 Mt of coal per annum without requirement of any additional land to bridge demand supply gap.
- This project enables extraction of 4.00 Mt of balance coal.
- Thin seams, which are not amenable for extraction by underground method, can be extracted by opencast method.

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