



सीएमपीडीआई  
*cmpdi*  
A Mini Ratna Company

# MINING PLAN OF BHURKUNDA COLLIERY

Project Area (Ha)	Capacity OCP & UG (MTPA)
910.16 Ha	2.05

(Barka Sayal Area)  
**Central Coalfields Limited**  
(April, 2018)

Prepared at

Regional Institute – III

**Central Mine Planning & Design Institute Ltd.**  
(A Subsidiary of Coal India Ltd.)  
**Gondwana Place, K9anke Road**  
**Ranchi-834008, Jharkhand**

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# Chapter 1

## Executive Summary

### 1.1 Summary

1	<p>The Bhurkunda Colliery is situated in Ramgarh district of Jharkhand and falls in South Karanpura Coalfields. This colliery belongs to the Barka-Sayal area of Central Coalfields Limited (CCL), a subsidiary of Coal India Limited.</p> <p>The mining in Bhurkunda Colliery started in the year 1924 under the ownership of State Railways and subsequently transferred to National Coal Development Corporation (NCDC) in 1956. Later in the year 1973, it came under the control of Central Coalfields limited (CCL).</p>
2	<p>The proposed Bhurkunda Colliery is located in the South Karanpura Coalfield and falls in the Ramgarh district of Jharkhand. The block is bounded by latitudes 23°39'00" to 23°41'00" North and longitudes 85°21'00" to 85°23'30" East. The block is covered by Survey of India toposheet no. 73E/6 (in 1:50,000 scale). The project is bounded by Lapanga/ Jeewandhara project in the east, Gidi-A colliery in the north, CCL Saunda Colliery in the north-west, Saunda-D Colliery in the west. Refer Plate I for location of project on toposheet.</p>
3	<p>The area is highly undulating. The ground elevation of the block ranges from 342m above M.S.L to 360m above M.S.L. The Damodar river, flowing from west to east in the north of the project boundary is the major drainage.</p>
4	<p>The area is well connected by Rail and road. The nearest Railway station Bhurkunda of Eastern Railway on Gomoh–Barkakana–Dehri-on-Sone loop line is about 3km from the Project. The State Highway No 2 (SH-2) is about 2km from the southern part of the block which connects Ramgarh (about 16km) in the east and Patratu (about 10km) in the west. The existing road communication connects the block with other adjoining projects and also the office of the GM, Barka-Sayal. The block is about 48km from Ranchi via SH-2. The nearest commercial airport is situated at Ranchi.</p>
5	<p>No previous Environmental Clearance.</p>
6	<p>Pre-feasibility report of Bhurkunda Colliery by combining OC and UG workings is being prepared for the rated capacity of 2.05 MTPA (1.75 MTPA for OC and 0.30 MTPA for UG) and within the project area of 910.16 Ha. This PFR is being prepared for EC application as per MoEFCC notification vide letter no SO 804 (E) Dt.14.03.2017 and subsequent notifications 1030 (E) Dt 08.03.2018 &amp; OM No Z-11013/22/2017-IA-II (M) Dt 15/16.03.2018</p>

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7	The project area consists of 221.40 Ha of forest land, 399.74 Ha of Jungle Jhari, and 157.80 Ha of non-forest land.
8	It is proposed to dump 59.21 Mm <sup>3</sup> of OB into two external dumps located within the project area.
10	Proposed 2X10MV A33/6.6kV project sub-station will receive power at 33 kV from double circuit 33 kV overhead line feeder from 33/11 kV Urimari substation of CCL. Urimari substation receives power at 33 kV from BASAL/JSPL Sub-station of DVC. Approximate distance of proposed project Sub-station from Urimari substation is 10 km
11	The water requirement is proposed to be met from recycled mine water. There are no competing users of this water.
14	The project includes land of villages Deoria Bargawan, Kurse, Balkudra and Dunduwa in core zone, Ramgarh Dist.

## Chapter 2

# Project Background

### 2.1 Introduction

The Bhurkunda Colliery is situated in Ramgarh district of Jharkhand and falls in South Karanpura Coalfields. This colliery belongs to the Barka-Sayal area of Central Coalfields Limited (CCL), a subsidiary of Coal India Limited.

The mining in Bhurkunda Colliery started in the year 1924 under the ownership of State Railways and subsequently transferred to National Coal Development Corporation (NCDC) in 1956. Later in the year 1973, it came under the control of Central Coalfields limited (CCL).

Bhurkunda colliery consists of an area of 9.11 sq.km with three blocks - Bhurkunda with an area of 4.5 sq km, bhurkunda South West block 1.61 km and Bhurkunda North Extension with an area of 3.0 sq km. At present, Bhurkunda colliery is operational with both underground and opencast workings.

A Project report for Bhurkunda Block was prepared in Jan 1984 for a rated capacity of 0.3 Mty. The PR proposed winning of coal from Upper Sirka and Lower Sirka seams by manual means and Argada and Argada-A seams by mechanized shovel-dumper. An expansion PR for a rated capacity of 0.5MTY was subsequently prepared in the year February 1994 with an initial capital outlay of Rs. 32.66 Cr.

The details of production in the previous years from both UG and OC workings is as given below.

<b>Bhurkunda Colliery</b>	
<b>Year</b>	<b>Production in Mte</b>
<b>1974-75</b>	0.78
<b>1975-76</b>	0.87
<b>1976-77</b>	0.85
<b>1977-78</b>	0.85
<b>1978-79</b>	0.89
<b>1979-80</b>	0.8
<b>1980-81</b>	0.88
<b>1981-82</b>	0.93
<b>1982-83</b>	0.9
<b>1983-84</b>	0.92
<b>1984-85</b>	0.73
<b>1985-86</b>	0.72
<b>1986-87</b>	0.65
<b>1987-88</b>	0.8
<b>1988-89</b>	0.75

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<b>Bhurkunda Colliery</b>	
<b>Year</b>	<b>Production in Mte</b>
<b>1989-90</b>	0.79
<b>1990-91</b>	0.76
<b>1991-92</b>	0.78
<b>1992-93</b>	0.53
<b>1993-94</b>	0.65
<b>1994-95</b>	0.5
<b>1995-96</b>	0.46
<b>1996-97</b>	0.32
<b>1997-98</b>	0.4
<b>1998-99</b>	0.32
<b>1999-00</b>	0.35
<b>2000-01</b>	0.37
<b>2001-02</b>	0.37
<b>2002-03</b>	0.37
<b>2003-04</b>	0.46
<b>2004-05</b>	0.51
<b>2005-06</b>	0.49
<b>2006-07</b>	0.49
<b>2007-08</b>	0.4
<b>2008-09</b>	0.28
<b>2009-10</b>	0.34
<b>2010-11</b>	0.23
<b>2011-12</b>	0.16
<b>2012-13</b>	0.21
<b>2013-14</b>	0.23
<b>2014-15</b>	0.23
<b>2015-16</b>	0.45
<b>2016-17</b>	0.79
<b>2017-18</b>	1.12

## 2.2 Purpose of the report

Pre-feasibility report of Bhurkunda Colliery by combining OC and UG workings is being prepared for the rated capacity of 2.05 MTPA (1.75 MTPA for OC and 0.30 MTPA for UG) and within the project area of 910.16 Ha. This PFR is being prepared for EC application as per MoEFCC notification vide letter no SO 804 (E) Dt.14.03.2017 and subsequent notifications 1030 (E) Dt 08.03.2018 & OM No Z-11013/22/2017-IA-II (M) Dt 15/16.03.2018.

## **2.3 Identification of project & project proponent**

The project under consideration, i.e. Bhurkunda Colliery is administratively under Barka Sayal Area of CCL headed by General Manager, Barka-Sayal Area. Geologically, it falls in South Karanpura Coalfield in Ramgarh District of Jharkhand.

The mailing address of the Project Officer is as given below:

Project Officer,  
Bhurkunda Colliery,  
Barka Sayal Area, Central Coalfield Limited,  
P.O- Bhurkunda, District- Ramgarh, Jharkhand, PIN- 829135.

## **2.4 Location & Communication**

The proposed Bhurkunda Colliery is located in the South Karanpura Coalfield and falls in the Ramgarh district of Jharkhand. The block is bounded by latitudes 23°39'00" to 23°41'00" North and longitudes 85°21'00" to 85°23'30" East. The block is covered by Survey of India toposheet no. 73E/6 (in 1:50,000 scale). The project is bounded by Lapanga/ Jeewandhara project in the east, Gidi-A colliery in the north, CCL Saunda Colliery in the north-west, Saunda-D Colliery in the west. Refer Plate I for location of project on toposheet.

The area is well connected by Rail and road. The nearest Railway station, Bhurkunda of Eastern Railway on Gomoh–Barkakana–Dehri-on-Sone loop line is about 3km from the Project. The State Highway No 2 (SH-2) is about 2km from the southern part of the block, which connects Ramgarh (about 16km) in the east and Patratu (about 10km) in the west. The existing road communication connects the block with other adjoining projects and the office of the GM, Barka-Sayal. The block is about 48km from Ranchi via SH-2. The nearest commercial airport is situated at Ranchi.

## **2.5 Description of importance to the country and region**

### **Benefits at national level-**

Central Coalfields Limited is facing increasing demand of coal because of increased demand from industry and steel sector. Continuing of coal production from the mines of CCL will help to bridge the gap of demand and supply of coal in India. To meet the growing demand of coal, especially in power and steel sectors, CCL has planned to increase its production capacity from the present production level of 63.405 Mt. of coal during 2017-18 to 88.0 MTPA by 2020-21.

Continuation of coal production from Bhurkunda Colliery will help to a certain degree to meet the growing demand of coking coal in the country.

### **Benefits at regional level-**

The project has created employment opportunities both for skilled and semi- skilled persons in the area. Power network has been extended to the project site for the construction & operation of the plant. This network is facilitating distribution of power in the neighbouring area. The project has brought about enhanced socio-economic benefits to local population due to expenditure on CSR activities

## **2.6 Employment Generation:**

Bhurkunda Colliery is operating since 1924. Bhurkunda colliery has been a major source of direct and indirect employment for nearby villagers in buffer zone. CCL has been running major skill development centre, Bhurkunda ITI including other schools like DAV for enrichment of nearby villagers.

## Chapter 3

# Project Description

### 3.1 Mining Method

#### a. Opencast

Opencast workings in Bhurkunda colliery are operational in two quarries. Quarry 1, falling in North extension block and Quarry 2, falling in South West block.

Considering the geo-mining conditions, shovel-dumper combination has been envisaged for mining both the quarries. The targeted capacity of 1.75 MTY is proposed to be achieved from open cast workings (Quarry 1 & 2).

As the seams are steeply dipping, the mine will follow horizontal slicing method. The following mining parameters have been considered in the project.

Sl. No.	Particular	Unit	Value
1	OB Bench Height for 10-12 cum shovels	m	12-15
2	OB Bench Height for 5.5-6.5 cum shovels	m	8-10
3	Coal Bench Height for 10-12 cum shovels	m	12-15
4	Coal Bench Height for 5.5-6.5 cum shovels	m	8-10
5	Working bench width	m	50
6	Non - Working bench width	m	30
7	Bench Slope for OB and coal	Deg	60
8	Blast Hole Dia for OB and coal	mm	250/160
9	Powder Factor in OB and coal	Kg/cum	0.3-0.4 & 0.2

#### b. Underground

At present Bhurkunda UG Colliery has two working units, namely, Hathidari Incline and Bansgarha Incline.

The developed pillars in both Hathidari and Bansgarha seam are being depillarded with caving. Preparation of coal at the faces are done by blasting off the solid. Blasted coal is loaded in to tubs and hauled by tigger haulage installed in the district. The machineries deployed in each district include three SDLs, one UDM, one roof bolter, one tigger haulage etc.

### 3.2 Geological and Mining Characteristics

#### Opencast:

The cumulative mineable reserve of both the quarries is estimated to be as 13.87 Mte (Quarry I: 9.30 Mte and Quarry II: 4.57 Mte) with corresponding volume of O.B estimated as 59.21 Mm<sup>3</sup>. 19% of Geological loss and Mining loss has been considered to arrive at the net

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mineable reserve of the project. The seams having less than 1m thickness has been excluded for the calculation of the mineable reserve. Seam wise geological reserves of both the quarries is as given below.

**Quarry I: Seamwise details of Geological vis-à-vis Mineable Reserves**

S N	Seam Name	Seam Thickness (m)	Geological Reserve (MT)	Balance Mineable Reserve (MT)
1	Bansgara	4.06-10.35	7.35	0.00
2	Bansgara A	3.11-4.60	4.39	0.02
3	Bansgara D	0.45-1.85	3.67	0.05
4	Upper Sirka	0.62-8.34	15.47	0.20
5	Middle Sirka	0.41-2.70	3.64	0.07
6	Lower Sirka	0.76-4.92	8.29	0.24
7	Argada	5.50-28.63	79.91	3.60
8	Argada A	2.59-12.67	56.78	2.06
9	Argada B	0.39-8.17	27.86	1.40
10	Argada C Top	0.26-2.27	5.92	0.17
11	Argada C Bot	0.48-4.25	10.02	0.56
12	Argada D Top	0.35-3.37	7.83	0.64
13	Argada D Mid	0.17-3.71	11.58	0.19
14	Argada D Bot	0.07-3.20	7.79	0.11
15	Argada F Top	0.20-2.40	0.66	0.00
16	Argada F Bot	0.88-2.96	0.78	0.00
17	Argada G	0.20-3.88	1.24	0.00
18	Argada H	0.59-2.13	0.84	0.00
19	Argada I	0.16-4.89	1.87	0.00
20	Argada J	0.14-3.02	0.75	0.00
21	Argada K	0.30-3.95	1.34	0.00
			<b>257.98</b>	<b>9.30</b>

**Quarry II: Seamwise details of Geological vis-à-vis Mineable Reserves**

Coal Seam	Thickness Range (m)	Indicated Reserve (Mte)	Balance Mineable Reserve (MT)
Sayal	3.93-4.33	2.73	4.57
Upper Balkudra	8.18-8.31	5.64	
Lower Balkudra	4.00-7.00	3.65	

The mining parameters of the proposed opencast workings of Bhurkunda Colliery (1.75 mty) are given below:

Final Stage Mine Parameters

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Parameters	Unit	Quarry I	Quarry II
Dimensions of the quarry along strike (on floor)	m	900-2500	430
Depth of quarry	m	10-120	20-120
Dip rise length (on floor)	m	1300-1900	275
Seam Gradient	deg	15-35	10-12
Final Quarry Surface area	km <sup>2</sup>	1.55	0.33
Mineable reserves	(Mte)	9.30	4.57
Total OB	(Mcum)	38.43	20.78
Average Stripping Ratio	(cum/t)	4.13	4.55

### **Bhurkunda UG:**

The general strike of the formation in the block is North West to south east, gently swinging towards north-south. The general dip of the strata varies from 1 in 5 to 1 in 6. However, near the faults, the dip becomes steeper i.e 1 in 3.5 to 1 in 4.

Geo-mining characteristics of the seams given in the following table.

Particulars	Characteristics of seams	
	Hathidari	Bansgarha
Area of the coal bearing within Geological Block Boundary (sq.km)	1.2	
No. of Borehole intersections	1	2
Seam Thickness range (m) of the Block	2.26-2.26	4.06-4.27
Average thickness (m) in Mining Area	3.75	4.27
Av. Seam Gradient	1 in 5 to 1 in 6	
Average grade of coal	G-8	G-8
Degree of Gassiness	Degree II	Degree II
Immediate roof	Sand Stone	Sand Stone/Shale
Extractable reserve (Mte)	1.3 (Balance)	2.9 (Balance)
Status of mining	Depillaring in progress	Depillaring in progress

## **3.3 Coal Reserves and Life of the Mine**

### **Opencast:**

The cumulative mineable reserve is estimated to be as 13.87 Mte with corresponding volume of O.B estimated as 59.21 Mm<sup>3</sup> with an average stripping ratio of 4.30 cum/te. The mine life for target production of 1.75 MTY is 9 years. It includes 2 years of production buildup period. The break-up of life of mine are as under:

Particulars	Years
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Particulars	Years
Mine Life (Production period)	9 (Production period)
Production build-up period	2
Peak Production period	7
Total period	9

The mining schedule has been formulated based upon the adopted sequence of mine development.

Based on the normative annual capacity of the mine as 1.75 MT, the proposed mining schedule is generated for 9 years of mine life. (The targeted coal production from the mine is envisaged in 3<sup>rd</sup> year. Peak overburden load for the project has been estimated as 6.90 Mcum during 9<sup>th</sup> year in Quarry I and 5.35 Mcum in 3<sup>rd</sup> year in Quarry II.

The summarized mining schedule for coal extraction and corresponding overburden load for the Project is as given below:

**SUMMARISED MINING SCHEDULE**

Year	QUARRY I			QUARRY II			Cumulative Coal Production (MT)
	Coal Production (MT)	OB Removal (Mcum)	Stripping Ratio (cum/te)	Coal Production (MT)	OB Removal (Mcum)	Stripping Ratio (cum/te)	
1	0.10	-		0.50	3	6.0	0.60
2	0.52	3.26	6.3	0.50	4.32	8.6	1.02
3	0.65	3.83	5.9	1.10	5.35	4.9	1.75
4	0.65	2.80	4.3	1.10	3.59	3.3	1.75
5	0.88	3.52	4.0	0.87	3.39	3.9	1.75
6	1.50	5.75	3.8	0.25	0.68	2.7	1.75
7	1.50	5.75	3.8	0.25	0.45	1.8	1.75
8	1.75	6.63	3.8	-			1.75
9	1.75	6.90	3.9	-			1.75
	<b>9.30</b>	<b>38.43</b>	<b>4.13</b>	<b>4.57</b>	<b>20.78</b>	<b>4.54</b>	<b>13.87</b>

**Bhurkunda UG:**

The extractable coal from the remaining property of Hathidari seam where depillaring can be done is only around 13 lakh tonne. Bansgarha seam has a remaining extractable reserve of around 29 lakh tonne.

Seam/Sections	Balance Extractable Reserve (MT)
Hathidari	1.3
Bansgarha	2.9
Total	4.2

At the proposed production rate of 0.3 Mty, the estimated reserve will exhaust in 20 years.

### 3.4 Coal Handling & Dispatch System

The total coal produced from Bhurkunda colliery is proposed to transport to nearby Saunda railway siding by covered tipping trucks. Saunda siding located adjacent to the project boundary falling within the saunda block .

### 3.5 Power Requirement

Bhurkunda colliery receives power from 33/11 kV Giddi washery sub station of CCL. Giddi substation receives power at 33 kV from BASAL/JSPL sub-station of DVC. 6.6 kV OHTL feeders originating from the main substation is drawn along the quarry periphery for feeding power to various shovels, drills, pumps deployed in this project.

It is proposed to construct a 2X10MV A33/6.6kV project sub-station at project site. This will receive power at 33 kV from double circuit 33 kV overhead line feeder from 33/11 kV Urimari substation of CCL. Urimari substation receives power at 33 kV from BASAL/JSPL Sub-station of DVC.

### 3.6 Water Requirement

Bhurkunda colliery is an existing project in Barkasayal area of CCL. The coal production in the year 2017-18 is about 1.12 MTY. The details of mine discharge and water consumption details are as given below.

S.No.	Description	Discharge (m <sup>3</sup> /day)
I.	<b>Mine water discharge</b>	
	<b>OC</b>	1275
	<b>UG</b>	708
II.	<b>Industrial Consumption</b>	
	<b>OC</b>	43.80
	<b>UG</b>	2.00
III.	<b>Domestic Consumption</b>	
	<b>OC</b>	130
	<b>UG</b>	75
III	<b>Ground Recharge</b>	<b>1730</b>

The average mine water discharge of Bhurkunda colliery is approx. 1983 Cu.m/day. Out of which, around 45 Cu.m/day is being utilised for industrial purposes and 205 Cu.m/day is being utilised for domestic purposes. The remaining water is being stored in the mine voids for recharge of ground water.

The above given details are as per the existing production. However, a detailed water balance will be prepared in EIA/EMP including mine discharge.

### 3.7 Land Requirement

The total proposed project area of Bhurkunda colliery is 910.16 Ha. Bhurkunda colliery includes Bhurkunda OC & UG workings and Balkudra OC working. The land use detail during mining is as follows.

S.No	Particulars	Total area in Ha
1	Quarry 1&2	196.73
2	External Dump 1	107.87
3	External Dump 2*	68.63
4	Infrastructure ( Road, W/s, S/S, embankment)	19.95
5	Old UG and OC Workings	424.28
6	Nala+ water Body	19.50
7	Safety zone & green belt	10.75
8	Underground Working	130.71
9	Total Area	<b>910.16</b>

\*Proposed external dump is located over the underground working area.

The details of type of land within the proposed project area is as follows.

TYPE OF LAND	AREA IN HECTARE
Notified Forest	254.43
GMK-JJ	366.71
Non-Forest	289.02
<b>TOTAL</b>	<b>910.16</b>

- Refer Plate II for Revenue Plan showing type of Land

## Chapter 4

# Site Description

### 4.1 Identification of Project

The project under consideration, i.e. Bhurkunda Colliery is administratively under Barka Sayal Area of CCL headed by General Manager, Barka Sayal Area. Geologically, it falls in South Karanpura Coalfield in Ramgarh District of Jharkhand.

The mailing address of the Project Officer is as given below:

Project Officer,  
Bhurkunda Colliery,  
Barka Sayal Area, Central Coalfield Limited,  
P.O- Bhurkunda, District- Ramgarh, Jharkhand, PIN- 829135.

### 4.2 Topography

The area is highly undulating. The ground elevation of the block ranges from 342m above M.S.L to 360m above M.S.L. The Damodar river, flowing from west to east in the north of the project boundary. The Balkudra project falls in the watershed of Naikari nadi, which flows towards north-east of the project. The distance of the quarry from Naikari nadi is at least 100 m in the north of the project. Naikari nadi meets master drainage Damodar river in the north-east of the project. Kurse nala, which is the tributary of Naikari nadi flows through the leasehold area at around 60 m from the proposed quarry and meets Naikari nadi in the north. The easterly flowing Damodar River is the major drainage and perennial source of water for the area. The HFL of the Naikari nadi as recorded in the vicinity of the project is 344.43 m above MSL (As on 17.09.1976) (nearby RL is around 354.30 m). The RL of the Kurse nala as recorded in the vicinity of the project is 345 m above MSL (nearby RL is around 354.30 m). Other major streams flows through the buffer zone are Potanga nala, Tiliya nala and Gobardana nala, Pararu nala etc. The drainage pattern of the area is mostly dendritic.

### 4.3 Land Use Pattern

The total proposed project area of Bhurkunda colliery is 910.16 Ha. Bhurkunda colliery includes Bhurkunda OC & UG workings and Balkudra OC working. The land use detail during mining is as follows.

The details of type of land within the proposed project area is as follows.

<b>TYPE OF LAND</b>	<b>AREA IN HECTARE</b>
Notified Forest	254.43
GMK-JJ	366.71
Non-Forest	289.02

Pre-feasibility Bhurkunda Colliery (2.05 MTY, 910.16 Ha)

<b>TOTAL</b>	<b>910.16</b>
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## **4.4 Climate**

The area witnesses a tropical climate. The daily mean temperature zone as per annual Temperature Map of India is 22.5<sup>o</sup> C to 25<sup>o</sup> C. Heavy rainfall occurs in the month of July to October. The average annual rainfall varies from 1200-1400mm of rain fall.

## Chapter 5

# Project Planning

### 5.1 Life of Mine and Magnitude of Operation

The cumulative mineable reserve is estimated to be as 13.87 MT with corresponding volume of O.B estimated as 59.21 Mm<sup>3</sup> with an average stripping ratio of 4.30 cum/te. The mine life for target production of 1.75 MTY is 9 years. It includes 2 years of production builtup period. The break-up of life of mine are as under:

Particulars	Years
Mine Life (Production period)	9 (Production period)
Production build-up period	2
Production period	7
Total period	9

The mining schedule has been formulated based upon the adopted sequence of mine development.

Based on the normative annual capacity of the mine as 1.75 MT, the proposed mining schedule is generated for 9 years of mine life (The targeted coal production from the mine is envisaged in 3<sup>rd</sup> year. Peak overburden load for the project has been estimated as 6.90 Mcum during 9<sup>th</sup> year in Quarry I and 5.35 Mcum in 3<sup>rd</sup> year in Quarry II.

The summarized mining schedule for coal extraction and corresponding overburden load for the Project is given below:

#### SUMMARISED MINING SCHEDULE

Year	QUARRY I			QUARRY II			Cumulative Coal Production (MT)
	Coal Production (MT)	OB Removal (Mcum)	Stripping Ratio (cum/te)	Coal Production (MT)	OB Removal (Mcum)	Stripping Ratio (cum/te)	
1	0.10	-		0.50	3.00	6.0	0.60
2	0.52	3.26	6.3	0.50	4.32	8.6	1.02
3	0.65	3.83	5.9	1.10	5.35	4.9	1.75
4	0.65	2.80	4.3	1.10	3.59	3.3	1.75
5	0.88	3.52	4.0	0.87	3.39	3.9	1.75
6	1.50	5.75	3.8	0.25	0.68	2.7	1.75
7	1.50	5.75	3.8	0.25	0.45	1.8	1.75
8	1.75	6.63	3.8	-			1.75
9	1.75	6.90	3.9	-			1.75
	<b>9.30</b>	<b>38.43</b>	<b>4.45</b>	<b>4.57</b>	<b>20.78</b>	<b>4.50</b>	<b>13.87</b>

**Bhurkunda UG:**

The extractable coal from the remaining property of Hathidari seam where depillaring can be done is only around 13 lakh tonne. Bansgarha seam has a remaining extractable reserve of around 29 lakh tonne.

Seam/Sections	Balance Extractable Reserve (MT)
Hathidari	1.3
Bansgarha	2.9
<b>Total</b>	<b>4.2</b>

At the proposed production rate of 0.3 Mty, the estimated reserve will exhaust in 20 years.

**5.2 Land Use Planning**

**5.2.1 Land Use Plan during Mining**

The total proposed project area of Bhurkunda colliery is 910.16 Ha. Bhurkunda colliery includes Bhurkunda OC & UG workings and Balkudra OC working. The land use detail during mining is as follows.

S.No	Particulars	Total area in Ha
1	Quarry 1&2	196.73
2	External Dump 1	107.87
3	External Dump 2*	68.63
4	Infrastructure ( Road, W/s, S/S, embankment)	19.95
5	Old UG and OC Workings	424.28
6	Nala+ water Body	19.50
7	Safety zone & green belt	10.75
8	Underground Working	130.71
9	Total Area	<b>910.16</b>

\*Proposed external dump 2 is located over the underground working area.

- Refer Plate III for Final Stage Quarry/land-use plan

**5.2.2 Post-Mining Land Use Plan**

**Dumping Strategy:**

Total overburden quantities estimated for Quarry1 is 38.43 M.cum of OB which needs to be accommodated in the External OB Dump in the area available at the north of quarry. The

## Pre-feasibility Bhurkunda Colliery (2.05 MTY, 910.16 Ha)

proposed external dump height is maximum 90m from immediate surface level with an overall slope of  $<28^{\circ}$ . The height of the individual bench is 30m with facing berm width of 30m and side berm width is kept 30m on all sides.

Total OB estimated from Quarry 2 is 20.78 Mm<sup>3</sup>. It is proposed to dump 18.36 Mm<sup>3</sup> externally on an area of 69.32 Ha, which is a coal bearing area having existing UG workings. However, an amount of 2.42 million cum over 8.71 Ha is proposed to be dumped internally.

### 5.2.2.1 Post Mining Reclamation Plan

The proposed post mining land use plan is as given below.

S.No	During Mining		Post-Mining	
	Particulars	Total area in Ha	Particulars	Total area in Ha
1	Quarry 1&2	196.73	Mine void filled with water	196.73
2	External Dump 1	107.87	Plantation on Ext. Dump	107.87
3	External Dump 2*	68.63	Plantation on external Dump	68.63
4	Infrastructure (Road, W/s, S/S, embankment)	19.95	Infrastructure	19.95
5	Old UG and OC Workings	424.28	Reclamation and Settlement	424.28
6	Nala+ water Body	19.50	Nala+ water Body	19.50
7	Safety zone & vacant land	10.75	Plantation on safety Zone and vacant land	10.75
8	Underground Working	130.71	Plantation on UG workings	130.71
<b>Total Area</b>		<b>910.16</b>		<b>910.16</b>

\*Proposed external dump 2 is located over the underground working area.

## 5.3 Amenities/Facilities

Bhurkunda colliery is an existing project. The facilities for industrial purposes like workshop, substations, offices, Magazine site etc. have already been set up. Further, amenities for working manpower like Residential colony, schools, hospitals, community centres have already been established.

## Chapter 6

# Infrastructure

### 6.1 Existing Infrastructure

Bhurkunda colliery is an existing project. The facilities for industrial purposes like workshop, substations, offices, Magazine site etc. have already been set up. However, for the proposed mining activity, it is required to shift the existing infrastructure. An area of 58.44 Ha has been allocated for setting up industrial infrastructure.

Further, amenities for working manpower like Residential colony, schools, hospitals, community centres have already been established. For the proposed mining activity, shifting of existing colony may be required. The shifting plan will be detailed in the Mining plan of Bhurkunda colliery.

### 6.2 Proposed Infrastructure

New Road has been proposed along the North-eastern boundary for public use.

### 6.3 Drinking water Management

The drinking water requirement of proposed project and nearby villages is being fulfilled by the mine discharge. Mine voids filled with water have been acting as a major source of water for colony and nearby settlement.

### 6.4 Sewerage System

An insignificant quantity of clayey sludge from effluent settling may be produced which will be backfilled.

Small quantity of domestic waste will be generated from Project colony which will be buried in de-coaled area.

### 6.5 Industrial Waste water Management:

The mine water is being treated in sedimentation pond and workshop effluent is treated in O&G trap.

The water from underground and opencast workings is routed through settling pond to arrest suspended solids.

## **6.6 Solid waste Management**

Solid wastes that will be generated in course of coal mining are overburden material from opencast consisting of fragments of sandstone/shale of assorted size. They have not been found to generate acid mine drainage or leach high quantity of heavy metals.

Total overburden quantities estimated for Quarry1 is 38.43 M.cum of OB which needs to be accommodated in the External OB Dump in the area available at the north of quarry. The proposed external dump height is maximum 90m from immediate surface level with an overall slope of  $<28^{\circ}$ . The height of the individual bench is 30m with facing berm width of 30m and side berm width is kept 30m on all sides.

Total OB estimated from Quarry 2 is 20.78 Mm<sup>3</sup>. It is proposed to dump 18.36 Mm<sup>3</sup> externally on an area of 69.32 Ha, which is a coal bearing area having existing UG workings and an amount of 2.42 million cum is proposed to be dumped internally over 8.71 Ha.

## **Chapter 7**

# **Rehabilitation & Resettlement**

### **7.1 Status of R&R**

Mining activities under Bhurkunda colliery have been in operation since 1924 and land has already been acquired. Therefore, no R&R is needed for this proposal.

## Chapter 8

# Project Schedule & Cost Estimates

### 8.1 Capital Expenditure

The existing initial capital investment as per approved PR for OC workings is Rs. 32.66 Cr and UG workings is Rs. 1.57 Cr.

### 8.2 Capital Cost of Environmental Measures

SN	Particulars	Amount (Rs Lakh)
1	Capital for Bio reclamation of External and Internal dumps	285.00
2	Construction & Maintenance of Effluent treatment Plant	60.00
3	2 No. water sprinkler	150.46
4	Maintenance of Haul road for dust suppression	93.00
5	Garland drain & sedimentation lagoon etc	20.00
6	Rainwater harvesting scheme	15.00
7	Construction of piezometer for ground water level monitoring	20.00
8	Base line data generation, EIA & EMP , public consultation etc.	25.00
	Total	668.46

## **Chapter 9**

# **Analysis of Proposal**

The mining in Bhurkunda Colliery started in the year 1924 under the ownership of State Railways and subsequently transferred to National Coal Development Corporation (NCDC) in 1956. Later in the year 1973, it came under the control of Central Coalfields limited (CCL).

A Project Report for Bhurkunda colliery was prepared in 1959 for a production of 1.04 Mty including both underground and opencast.

This pre-feasibility report of Bhurkunda Colliery by combining OC and UG workings has been prepared for the rated capacity of 2.05 MTPA (1.75 MTPA for OC and 0.30 MTPA for UG) and within the project area of 910.16 ha for making an application in Form I for EC.

Central Coalfields Limited is facing increasing demand of coal because of increased demand from industry and steel sector. Continuing of coal production from the mines of CCL will help to bridge the gap of demand and supply of coal in India. To meet the growing demand of coal, especially in power and steel sectors, CCL has planned to increase its production capacity from the present production level of 63.405 Mt. of coal during 2017-18 to 88.0 MTPA by 2020-21. Continuation of coal production from Bhurkunda Colliery will help to a certain degree to meet the growing demand of coking coal in the Country.