

INTRODUCTION OF MASS PRODUCTION TECHNOLOGY IN CHURI U/G MINE

**Strategy to revive a less productive mine
to productive mine**

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INTRODUCTION:

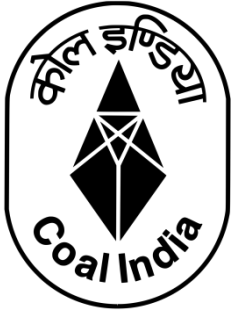


Churi Colliery is one of the prestigious mine of CCL located in the south-central part of North Karanpura coal field covering an area of about **7.68 sq.km (765.13Ha)** in Ranchi District of Jharkhand State and is approachable from Ranchi (**~70KM**) by road.

It is situated at a distance of 8 km on fair weather road connecting Khalari and Ray railway stations on the Gomoh-Dehri-on-Sone loop line of the East Central Railway. An all weathered 25 km long road links Khalari with Bijupara village on the National highway connecting Ranchi and Daltonganj.

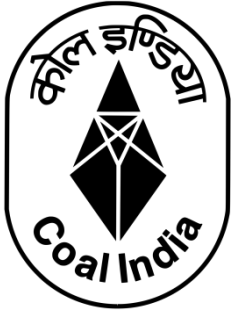


Plan of Churi Colliery





MINE DETAILS



- Presently Churi underground (Re-organization) is an on-going project with rated capacity of 0.81 MTPA.
- Mine started in the year 1942 with conventional system
- The mine is divided in three blocks
 - I. CHURI OLD
 - II. Churi Extension Block(churi re- organization)
 - III. Benti block
- The seams belong to Karharbari formation.
- There exist two workable seam: Upper Bachra and Lower Bachra
- The depth of the mine varies from 80-90m
- There are two rivers passing along the east and west side of the property namely Saphi and Damoder rivers respectively.
- Seam gradient: 1 in 7.75 (N11°40'W)
- Pillar size: 25M x 25M
- Reserve of the mine- 11MT
- Coal Grade in
 - lower bachra seam: G7
 - Upper bachra seam: G9



LAND DETAILS (Ha.)



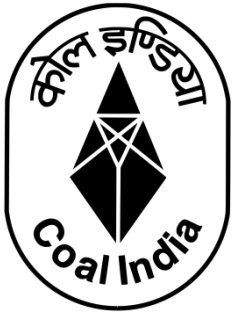
Block	Notified forest	GMJJ	GMK+GMA	Tenancy	Total Land
Churi	445.73	82.36	23.70	37.07	588.86
Benti	48.59	17.25	21.10	89.33	176.27
Total	494.32	99.61	44.80	126.40	765.13

STATUS OF EC AND FC (Ha.)

Clearance	Obtained	Required
EC	244.60	359.40
FC	312.76	281.17



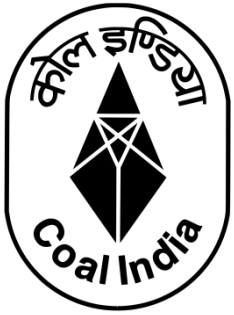
MINE HISTORY



- Churi colliery is a nationalised U/G coal mine in north Karanpura Area of CCL
- Churi Mine was opened in the year 1942 through incline no. 1 developed in lower bachra seam
- Then incline no. 2 and 3 were opened in the year 1948, which were also developed in lower bachra seam
- These workings were also approached by the incline number 4 & 5 which were driven in the year 1950
- During the depillaring, fire occurred in Goaf area on 11 September 1956 due to spontaneous heating
- The fire was sealed off by erection of isolation stopping.
- As the mining condition was not conducive for working, the entrance of the mine was completely sealed off in the year 1965.
- In the year 1958 inclines number 1A, 2A and 3A were opened and developed in upper bachra seam and also through that lower bachra seam



MINE HISTORY



- But due to upthrow fault the working was stopped
- In the year 1967, incline number 4A was opened to develop upper bachra seam
- After nationalisation, 1000 Acres (404.68 hectare) land was acquired under CBA act as Churi Extension Block
- In the year 1981 incline number 6 and 7 were opened and the project was known as **Churi Re-Organisation**
- A development work in the both seam completed upto 2002 in Churi Extension Block and are standing on pillar
- After completion of Churi Extension Block/Churi Re-Organisation, boundary adjustment was done by Ray Bachra Colliery and Ashok Project in 2002, and development work was continued
- The Benti Block also came under Churi Project with the boundary adjustment of Ashok Project
- SDL was introduced in the year 1995 and LHD was introduced in the year 2000



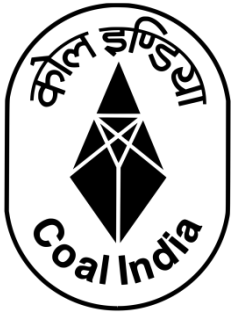
Production Details before the Introduction of Mass Production Technology

Sl.	year	Production(Te.)
1	1986-87	1,56,000
2	1987-88	1,50,000
3	1988-89	2,05,000
4	1989-90	228000
5	1990-91	214000
6	1991-92	230000
7	1992-93	240000
8	1993-94	246000
9	1994-95	204000
10	1995-96	226000
11	1996-97	236000
12	1997-98	229000
13	1998-99	224000
14	1999-2000	233000
15	2000-01	210000
16	2001-02	172000

Sl.	year	Production(Te.)
17	2002-03	175000
18	2003-04	185000
19	2004-05	168000
20	2005-06	161000
21	2006-07	135831
22	2007-08	121258
23	2008-09	78229
24	2009-10	79275
25	2010-11	77050
26	2011-12	55960
27	2012-13	28242
28	2013-14	26155
29	2014-15	28020
30	2015-16	34010
31	2016-17	42340
32	2017-18	11480
33	2018-19	1950



PRESENT STATUS



- **CMPDIL** has prepared a revised project report for introduction of mass production technology in the Yr.2007
- The agreement for deployment of CM(continuous miner) has been signed in the Yr.2017 between CCL and M/s JMS
- The mass production Technology had been established and coal production started from 24.03.2019
- Depillaring of standing pillar started with CM in Churi Block
- Churi mine is best known for the first –time deployment of continuous in an U/G mine.
- At present , churi mine is the highest producing U/G mine in CCL.



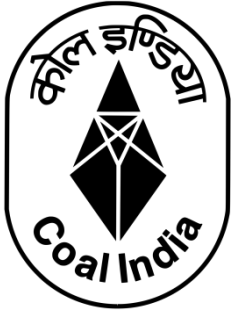
Method of working



- To widen and heighten existing galleries
- To extract pillar by modified NEVID method (fig. in Next slide)
- The Non-split method of extraction was originally developed in South Africa by SASOL named NEVID.
- A modified system suiting to our condition in India was developed as Non-Split method
- This system has been successfully introduced at Kapildhara, Bangwar ,Kurja and Vindhya of SECL by Jms.
- The same method was successfully introduced for Depillaring Panels in Churi mine.



CM PACKAGE CONSIST OF FOLLOWING EQUIPMENTS:



- | | | |
|--------------------|---|---------------|
| • Continuous Miner | – | 1 no. |
| • Twin bolter | – | 2 nos. |
| • Battery hauler | – | 2 nos. |
| • Feeder breaker | – | 1 no. |
| • Load centre | – | 1 no. |
| • LHD (3 Cu.m) | – | 1 no. |



Method of mining

Method of Mining (Deployment of Continuous Miner)



Transportation by Conveyor Belt Installed in 7th Incline



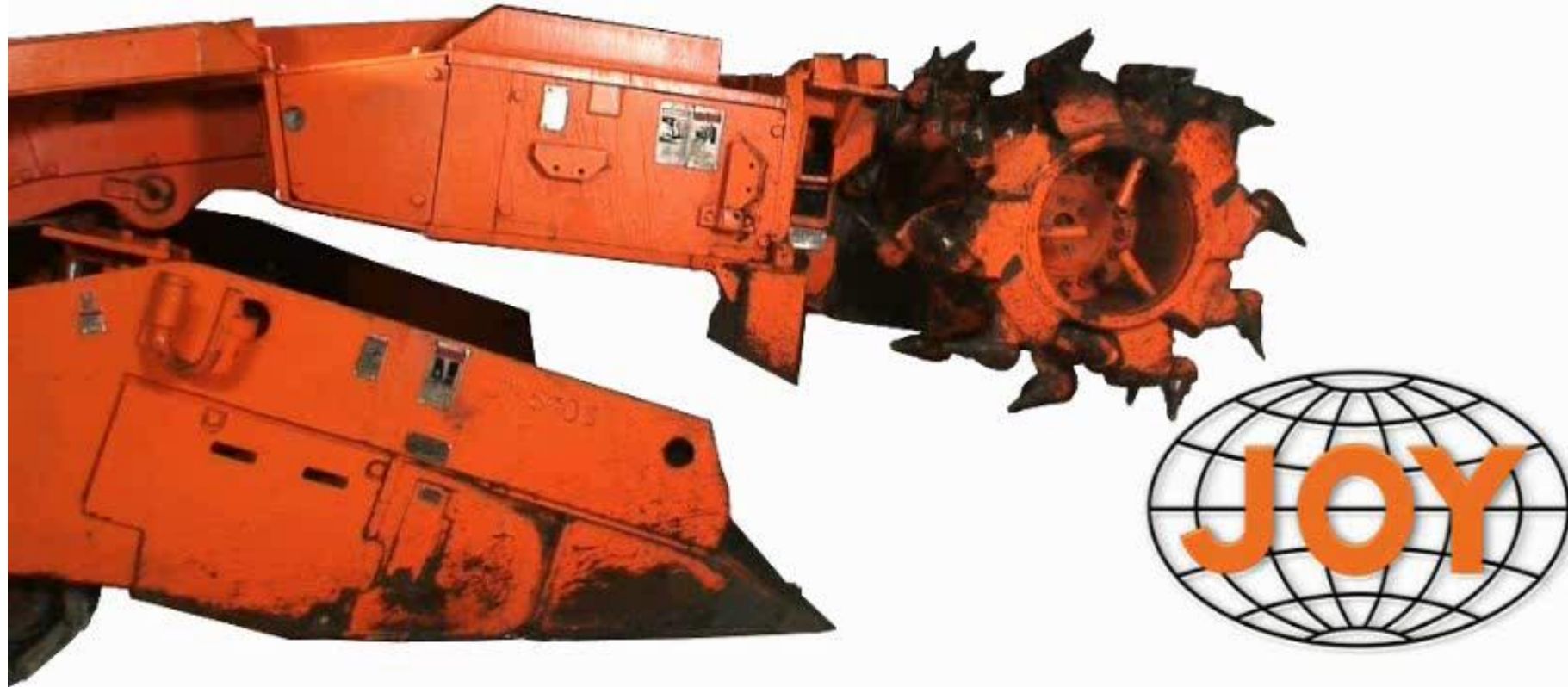
Targeted Production:- 0.5MT(JMS) & Mine Target – 0.65MT



Operation of Continuous Miner

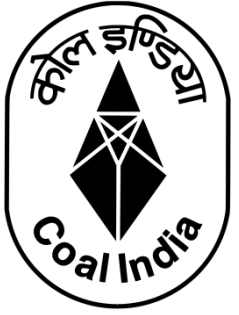


The Continuous Miner





Operation of Battery hauler





Operation of Feeder breaker





TWIN BOLTER



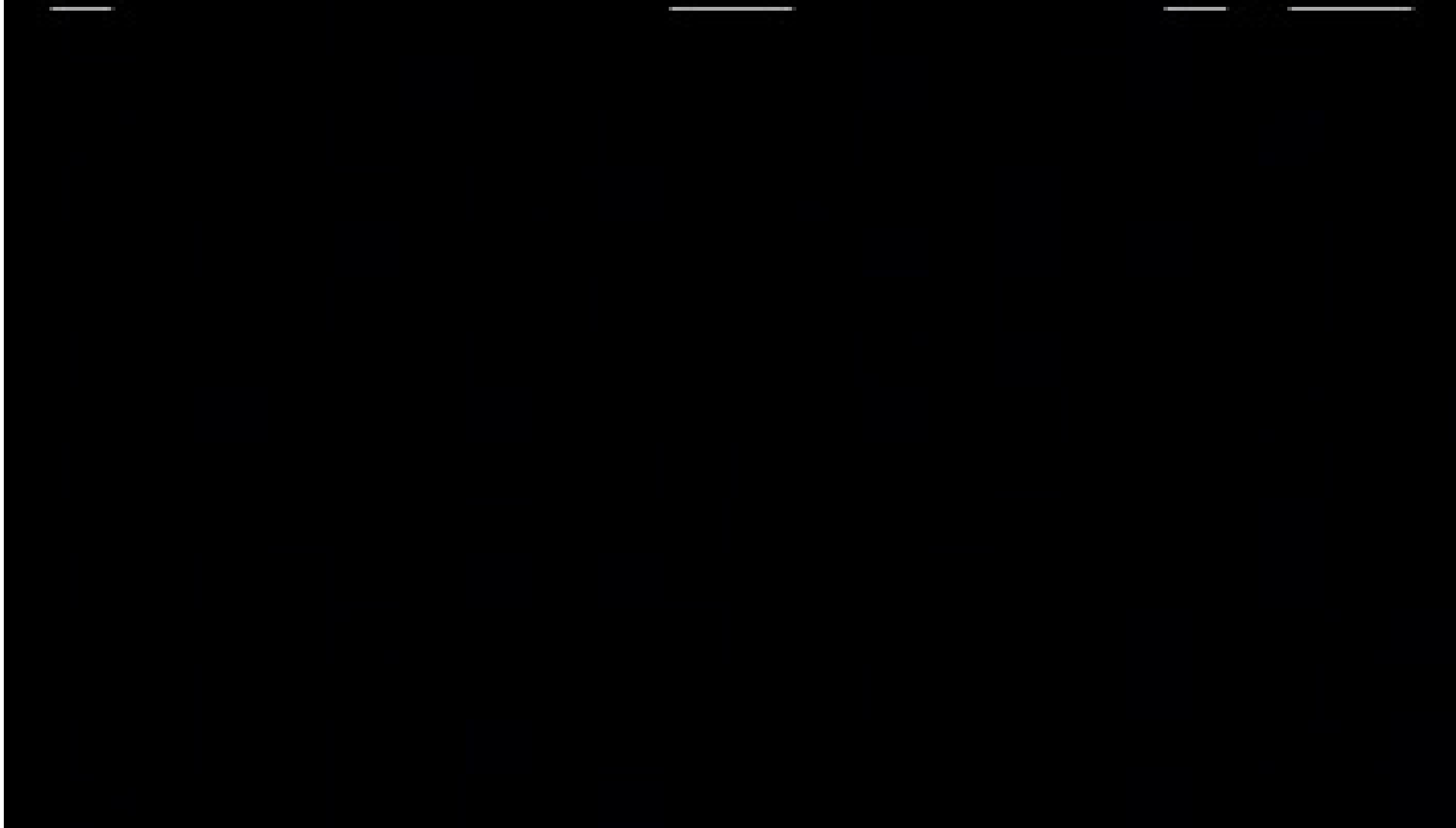
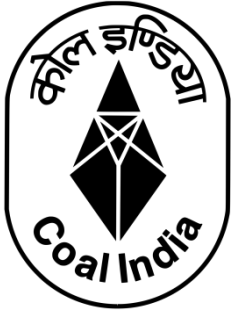
Comparison

Sl. No.	Particulars	Before introduction of CM	After introduction of CM
1	Method of working	Bord and pillar Only development	Bord and pillar Development and Depillaring
2	manpower	Average 2000 nos.	Average 350 no.
3	OMS	<1	>5
4	Manpower at active working face	>20	<5
5	Explosive	used	No use of Explosive
6	Production	Max.240000 Te	Max.705000 Te.
7	No. of working	2-3 panels	Only 01 panel



TWIN BOLTER

(In Operation)





**Production statistics:
AFTER INTRODUCTION OF MASS PRODUCTION TECHNOLOGY (CM)**



YEAR	TARGET (TONNES)	ACHIVEMENT (TONNES)	REMARK
2018- 2019	0	1950	COMISSIONING OF CM PACKAGE
2019-2020	3,00,000	4,76,164	
2020-2021	4,00,000	2,10,629	SPONTANEOUS HEATING
2021-2022	5,00,000	5,80,472	
2022-2023	6,50,000	7,05,925	21.6 % growth from previous FY.
2023-2024 (Upto NOV.)	6,50,000	4,23,148	



Accident Statistics

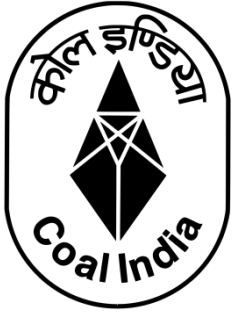


Accident statistics after deployment of mass production technology:

Year	Fatal	Serious	Reportable	Near Miss
2018	NIL	NIL	NIL	01
2019	NIL	01	NIL	NIL
2020	NIL	01	NIL	NIL
2021	NIL	NIL	NIL	NIL
2022	NIL	NIL	NIL	NIL



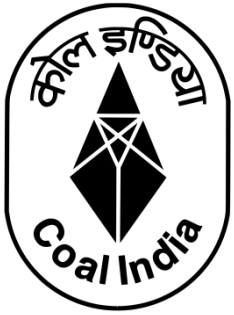
Manpower



- Average manpower before introduction of mass production technology: 2000
- Average manpower after the deployment of mass production technology: 350



Spontaneous heating



- In night shift of 8th aug.2020 ,an open fire observed in west 10 panel of the mine due to spontaneous heating.
- The fire was progressive in nature and started belching out smoke and tar which was observed in the fan drift.
- The methane gas reached to a level of 3.5% in the fan drift.
- Considering the severity of the situation ,the entries of the mine from the surface were sealed off by erecting the explosion proof isolation stopping the three entrance inclines and fan drift.
- It was reopened accordingly and achieved highest production in the next year



Spontaneous heating



- Mine was sealed off due to spontaneous heating on 8.8.2020
- The mine was reopened with full efforts of Rescue team and Churi team under the leadership of Mr. Sanjay Kumar, GM(N.K. Area) on 8.4.2021
- The site of spontaneous heating/fire that i.e. W9, W10 was sealed off
- This panel was reopened in 2022
- Next slide shows the summary of reopening



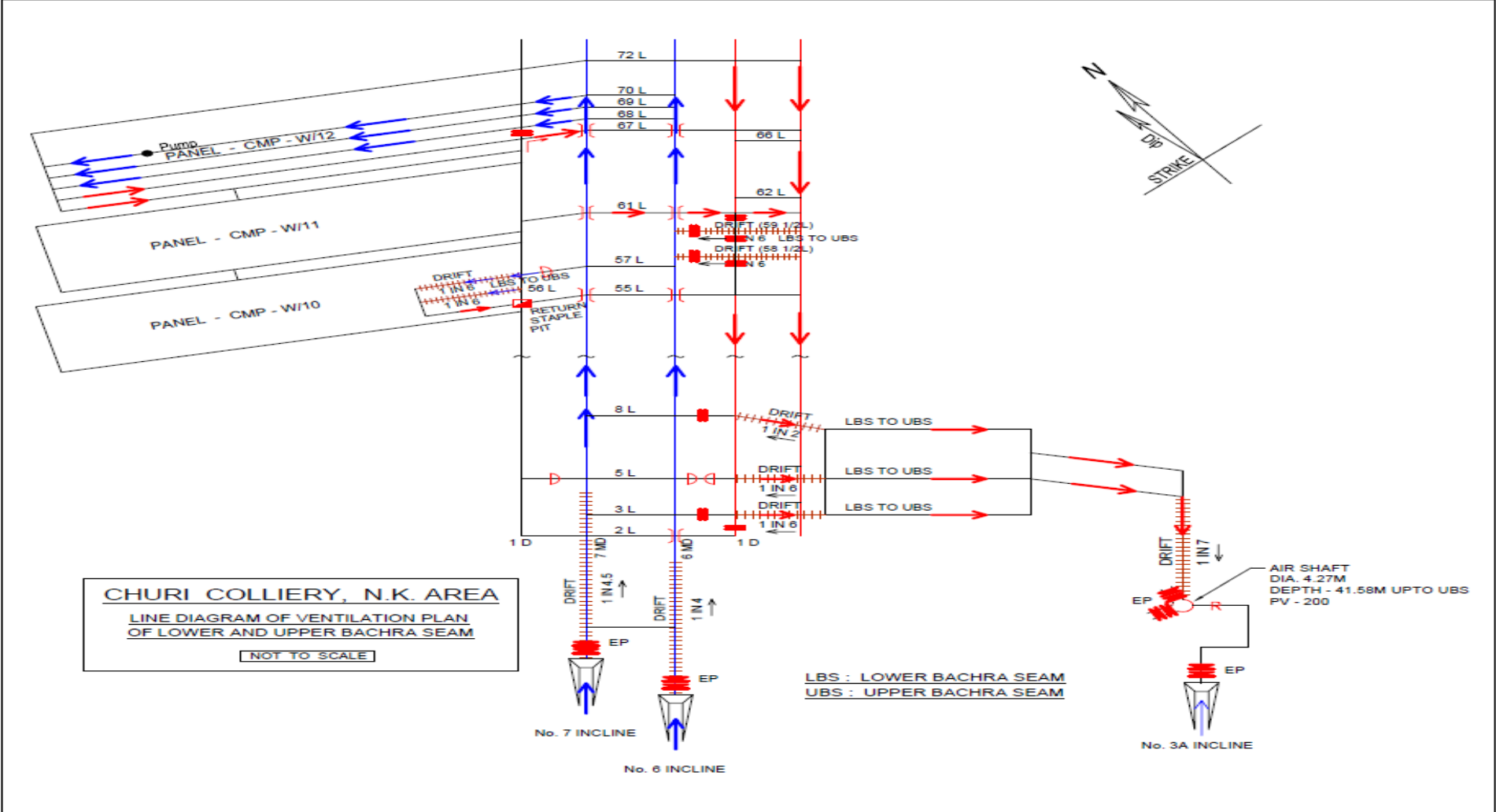
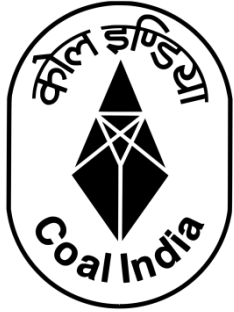
SUMMARY OF REOPENING



Sl.no	Date	Incident	Remark
1	8.8.2020	Occurrence of fire in drift connecting 2 seam in panel W10	
2	9.8.2020	Mine air sample analysis	In the drift Grahams ratio was 11%, indicating blazing fire
3	13.8.2020	Sealing of the mine	
4	14.12.2020	First attempt of reopening	MMV started for recovery operation
5	9.1.2021	Deterioration of mine atmosphere. withdrawal of person and sealing of mine entries	Excessive rise in CO, H ₂ and O ₂
6	12-19.1.2021	Nitrogen flushing and water mix foam flushing	Reduction in CO, H ₂ and O ₂
7	21.1.2021	Second and final reopening	Mine opening by creation of NPV
8	23.8.2021	Completion of recovery operation and commencement of production	



Ventilation Circuit





Conclusion



- Production improved drastically after introduction of CM
- Depillaring started of long standing pillars.
- Manpower reduced from average 2000no. To 350 no.
- Safety standard improved



SRI NARENDRA MODI
HON'BLE PRIME MINISTER OF INDIA
Churi Project



CCL

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