

CHAPTER

9



PROMOTIONAL AND DETAILED EXPLORATION

ANNUAL REPORT 2017-18

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Promotional Exploration

Geological Survey of India (GSI), Mineral Exploration Corporation Limited (MECL), State Governments and CMPDI are conducting Promotional Exploration under the Ministry of Coal's Plan

scheme of "Promotional Exploration for Coal & Lignite". The summary of Promotional Drilling carried out in coal & lignite during the period 2013-14, 2014-15, 2015-16, 2016-17, 2017-18 (anticipated) and proposed target for 2018-19 is given below:

(Drilling in Metre)

Command Area	2013-14 Actual	2014-15 Actual	2015-16 Actual	2016-17 Actual	2017-18 Anticipated	2018-19 Proposed BE
Drilling in CIL Command Area	53633	67144	52086	49695	76800	105000
Drilling in SCCL Command Area	9553	3575	0	0	0	5000
Drilling in Lignite Areas	68774	68777	60258	55686	40200	90000
Total	131959	139496	112344	105381	117000*	200000*
Growth%	16.46	5.71	-19.46	-6.19	11.02%	70.94%

*Achievement of target depends upon timely availability of forest clearance to take up drilling in forest areas, local support and occurrence of lignite in identified blocks.

Detailed Drilling In Non-Cil Blocks

Detailed Exploration in CIL and Non-CIL blocks are done by CMPDI. This is carried out on a strict timelines to bring resources falling in indicated and inferred category into the measured (proven) category. The exploratory drilling in non-CIL/captive

Mining blocks is taken up under the Ministry of Coal's Plan scheme of "Detailed Drilling in Non-CIL Blocks".

The details of actual drilling in Non-CIL/Captive Mining Blocks during the period 2013-14, 2014-15, 2015-16, 2016-17, 2017-18 (anticipated) and proposed target for 2018-19 is given below :

(Drilling in Metre)

Command Area	2013-14 Actual	2014-15 Actual	2015-16 Actual	2016-17 Actual	2017-18 Anticipated	2018-19 Proposed BE
CMPDI Departmental	93742	61427	55769	57663	106000	124000
Outsourcing by CMPDI	144159	220972	231502	251044	286000	496000
Total	237901	282399	287271	308070	3920000	620000

CMPDI has substantially improved its capacity of drilling during the XI & XII plan period. As against the achievement of 2.09 lakh metre in 2007-08, CMPDI has achieved 4.98 lakh metre in 2011-

12, 5.63 lakh metre in 2012-13, 6.97 lakh metre in 2013-14, 8.28 lakh metre in 2014-15, 9.94 lakh metre in 2015-16, 11.26 lakh metre in 2016-17. Drilling of about 12.50 lakh metre is likely

to be achieved in 2017-18 (11% Growth) through Departmental resources and outsourcing. For capacity expansion through modernization of departmental drills, 39 new Mechanical drills & 19 Hi-tech Hydrostatic drills have been procured since 2008-09, out of which 15 have been deployed as additional drills and 33 as replacement drills. CMPDI has also replaced 38 mud pumps and 74 trucks in last six years.

To meet the increased work load, recruitment has been taken up through campus interviews/open examinations. 259 Geologists, 34 Geo-physicists and 20 Mechanical Engineers as drilling Engineers have joined CMPDI since 2008-09. About 1240 non-executive staffs have also been inducted for exploration work.

Under outsourcing, the work of 84 blocks involving about 35 lakh metre of drilling was awarded through tendering since 2008-09, out of which drilling has been concluded in 46 blocks. Due to local (law & order) problems, work could not start in 2 blocks and stopped in 8 running blocks. The work is in progress in 25 blocks. Due to lack of forest clearance and adverse law & order problem, about 2.91 lakh metre of drilling could not be carried out in outsourced blocks in 2016-17. During 2017-18, a total of about 7.95 lakh metre (with 11% Growth) is likely to be drilled through outsourcing, out of which 3.76 lakh metre drilling would be done through tendering & 4.19 lakh metre through MoU with MECL.

Drilling Performance in 2017-18:

CMPDI deployed its departmental resources for detailed exploration of CIL/Non-CIL blocks whereas State Govt. of Odisha deployed resources in CIL blocks only. In addition, nine other contractual agencies have also deployed resources for detailed drilling/exploration in CIL/Non-CIL blocks. A total of 150 to 180 drills were deployed in 2017-18 out of which 64 were departmental drills.

Apart from the above, CMPDI continued the technical supervision of Promotional Exploration work undertaken by MECL in coal Sector (CIL & SCCL areas) in 6 blocks and DGM (Nagaland) in 1 block. CMPDI is also carrying out promotional exploration work in 2 blocks. Promotional Exploration work was undertaken by MECL in Lignite Sector in 5 blocks and by GSI in 1 block. A total of 1.17 lakh metre of promotional drilling is likely to be carried out in Coal (0.77 lakh metre) & Lignite (0.40 lakh metre) during 2017-18.

In 2017-18, CMPDI and its contractual agencies took up exploratory drilling in 110 blocks/mines of 22 coalfields situated in 7 States. Out of 110 blocks/mines, Departmental drills of CMPDI took up exploratory drilling in 47 blocks/mines whereas contractual agencies drilled in 63 blocks/mines.

The overall projected performance of exploratory drilling 2017-18 is given below:

Agency	Target 2017-18 (lakh m)	Performance of Exploratory Drilling in 2017-18 (Projected)			Achieved Prev. Year: 2016-17 (lakh m)	Growth (%)
		Achievement (lakh m)	Achievement (%)	+/- (lakh m)		
A Detailed Drilling Undertaken by CMPDI						
I. Departmental	4.75	4.55	96%	-0.20	4.41	3%
II. OUTSOURCING						
State Govts.	0.03	0.00	0%	-0.03	0.01	
MECL (MOU)	4.00	4.19	105%	0.19	3.56	15%
Tendering (CIL blocks)	2.04	2.64	129%	0.60	2.20	20%
Tendering (Non-CIL blocks)	1.68	1.12	67%	-0.56	1.07	47%
Total Outsourcing	7.75	7.95	103%	0.20	6.84	16%
Grant Total A	12.50	12.50	100%	0.00	11.25	11%

B. Promotional Drilling by MECL, GSI, DGM (Nagaland) & DGM (Assam)						
I. COAL SECTOR						
GSI	0.00	0.00		0.00	0.00	0%
MECL	0.808	0.60	74%	-0.208	0.484	24%
DGM, Nagaland	0.007	0.008	114%	0.001	0.006	34%
DGM, Assam	0.005	0.00	0%	-0.005	0.00	0%
CMPDI	0.03	0.16	533%	0.13	0.00	160%
SCCL	0.05	0.00	0%	-0.05	0.00	0%
Total Coal	0.90	0.77	85%	-0.13	0.49	57%
II LIGNITE SECTOR						
GSI	0.00	0.003		0.003	0.035	-90%
MECL	0.85	0.398	47%	-0.451	0.520	-23%
Total Lignite	0.85	0.40	48%	-0.448	0.555	-28%
Grand Total	1.75	1.17	67%	-0.58	1.05	12%

In 2017-18, CMPDI is likely to achieve overall drilling targets by 100%. The performance of departmental drilling is better than previous year with likely growth of 3% and recording average operational drills productivity of 555 m/drill/months. Non availability of permission to explore in forest areas & local problems (law & order) has affected the performance of outsourced drilling. GSI has not taken up the promotional exploration in coal. MECL could not achieve the targets of Promotional drilling in coal sector due to forest problems. DGM (Assam) could not deploy its rigs due to adverse law & order condition.

Progress of 2D & 3D seismic survey

During 2016-17, Seismic survey was taken up in Kewai block and Behraband West Extn. block, Sohagpur Coalfield and a total of 24.95 line km and 35.62 line km of survey was covered respectively. Their reports have been already submitted.

NGRI has already conducted 3D Seismic survey in Belpahar block, IB valley Coalfield under the promotional scheme covering an area of 10sq.km approximately in association with Geophysicist of CMPDI. Processing of data is over and interpretation is under progress. The report is expected by March 2018.

During 2017-18, 2D Seismic Survey work has been taken up in Gautam Dhara and Dip Side of Block –IV, IB Valley Coalfield. Additional two/three blocks will be covered in the current field season covering an area of 40 sq.km approx. A total of 1.03 lakh metre of geophysical logging, 106 line km of Resistivity profiling, 205 nos. of VES and 66 line km is anticipated in 2017-18.

Geological Reports

In 2017-18, 17 Geological Reports are likely to be prepared on the basis of detailed exploration conducted in previous years. In addition to this, 8 Revised Geological Reports/IGR/GN are also likely to be prepared. Through these Geological Reports about 5 Billion Tonnes of additional coal resources are likely to be upgraded to Measured (Proved) category.

Coal Resources

Inventory of Geological Resources of coal in India

As a result of exploration carried upto the maximum depth of 1200m by the GSI, CMPDI, SCCL and MECL, a cumulative total of 315.149 Billion tonnes of geological resources of coal have so far been estimated in the country as on 01.04.2017. The details of State-wise geological resources of coal are given below:

**STATEWISE GEOLOGICAL RESOURCES OF COAL IN INDIA
AS ON 01.04.2017**

STATE	Category-wise Coal Resources (in Million Tonnes)				
	Measured	Indicated	Inferred	Inferred	Total
	(Proved)		(Exploration)	(Mapping)	
WEST BENGAL	13723	12954	4990	0	31667
BIHAR	0	0	1354	0	1354
JHARKHAND	44341	31876	6223	0	82440
MADHYA PRADESH	11269	12760	3645	0	27673
CHHATTISGARH	19997	34462	2202	0	56661
UTTAR PRADESH	884	178	0	0	1062
MAHARASHTRA	7038	3158	2063	0	12259
ORISSA	34810	34060	8415	0	77285
ANDHRA PRADESH	0	1149	432	0	1581
TELANGANA	10402	8542	2520	0	21464
SIKKIM	0	58	43	0	101
ASSAM	465	57	1	3	525
ARUNACHAL PRADESH	31	40	13	6	90
MEGHALYA	89	17	28	443	576
NAGALAND	9	0	104	298	410
GRAND TOTAL	143058	139311	32030	750	315149

Source: Geological Survey of India's Inventory of Geological Resources of Indian Coal as on 01.04.2017. The inventory did not take into account the mined out reserves.

Categorization of Resources

The coal resources of India are available in older Gondwana formations of peninsular India and younger tertiary formations of north eastern region. Based on the results of Regional/Promotional Exploration, where the boreholes are normally placed 1-2 Km apart, the resources are classified into 'Indicated'

or 'Inferred' category. Subsequent Detailed Exploration in selected blocks, where boreholes are less than 400 meter apart, upgrades the resources into more reliable 'Proved' category. The formation-wise and Category-wise coal resources of India as on 1.4.2017 are given in table below:

(In million tonnes)

Formation	Proved	Indicated	Inferred	Total
Gondwana Coals	142464	139212	31885	313561
Tertiary Coals	594	99	895	1588
Total	143058	139311	32780	315149

The Type and Category-wise resources of India as on 01.04.2017 are given in table below:

(In million tonnes)

Type of Coal	Proved	Indicated	Inferred	Total
(A) Coking				
-Prime Coking	4614	699	0	5313
-Medium Coking	13501	12133	1879	27513
-Semi coking	519	995	193	1708
Sub Total Coking	18634	13826	2073	34533
(B) Non-coking	123830	125386	29813	279028
(C) Tertiary Coal	594	99	895	1588
Grand Total	143058	139311	32780	315149