

In pit crusher



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CHAPTER

PROMOTIONAL AND DETAILED EXPLORATION

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Promotional Exploration

Geological Survey of India (GSI), Mineral Exploration Corporation Limited (MECL), State Governments and CMPDI are conducting Promotional Exploration in XII plan under the Ministry of Coal's Plan scheme "Promotional Exploration for Coal & Lignite". The summary of Promotional Drilling carried out in coal & lignite during the period 2012-13, 2013-14, 2014-15, 2015-16, 2016-17 (anticipated) and target for 2017-18 is given below:

(Drilling in Metre)

Command Area	2012-13 Actual	2013-14 Actual	2014-15 Actual	2015-16 Actual	2016-17 Anticipated	2017-18 Proposed BE
Drilling in CIL Command Area	36725	53633	67144	52086	45700	85000
Drilling in SCCL Command Area	8899	9553	3575	0	2500	5000
Drilling in Lignite Area	67687	68774	68777	60258	53000	85000
Total	113312	131959	139496	112344	101200	175000
Growth%	20.94	16.46	5.71	-19.46	-9.92	72.92

Detailed Drilling in Non-CIL Blocks

CMPDI carries on Detailed Exploration in CIL and Non-CIL blocks as per 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 MoC's Plan scheme 'Detailed Drilling in Non-CIL Blocks'.

The details of actual drilling in Non-CIL/Captive mining blocks during the period 2012-13, 2013-14, 2014-15, 2015-16, 2016-17 (anticipated) and target for 2017-18 is given below:

(Drilling in Metre)

Command Area	2012-13 Actual	2013-14 Actual	2014-15 Actual	2015-16 Actual	2016-17 Anticipated	2017-18 Proposed BE
CMPDI (Departmental)	77458	93742	61427	55769	41050	92000
Outsourcing by CMPDI	150250	144159	220972	231502	240093	254000
Total	227708	237901	282399	287271	281143	346000

CMPDI has 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 drilling of 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 and expected about 10.63 lakh metre is likely to be achieved in 2016-17 (7% 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 made through campus interviews/open examinations. 259 Geologists, 34 Geophysicists and 20 Mechanical Engineers as drilling Engineers have joined CMPDI since 2008-09. About 1240 non-executive staff have also been inducted for exploration work.

Under outsourcing, the work of 75 blocks involving 30.23 lakh metre of drilling was awarded through tendering since 2008-09. Out of which drilling has been concluded in 36 blocks. Due to local (law & order) problems, work could not start in 3 blocks and stopped in 8 running blocks. Due to non-availability of forest clearance work was stopped in 15 blocks. During 2016-17, a total of about 6.52 lakh metre (11% Growth) is likely to be drilled

through outsourcing, out of which 3.77 lakh metre drilling would be done through tendering & 2.75 lakh metre through MoU with MECL.

Drilling Performance in 2016-17:

CMPDI deployed its departmental resources for detailed exploration of CIL/Non-CIL blocks whereas State Government 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 140 to 160 drills were deployed in 2016-17 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. Promotional Exploration work was undertaken by MECL in lignite sector in 10 blocks and by GSI in 1 block. A total of 1.01 lakh metre of Promotional drilling is likely to be carried out in coal (0.48 lakh metre) & lignite (0.53 lakh metre) during 2016-17.

In 2016-17, CMPDI and its contractual agencies took up exploratory drilling in 112 blocks mines of 22 coalfields situated in 7 States. Out of 112 blocks/mines, departmental drills of CMPDI took up exploratory drilling in 50 blocks/mines whereas contractual agencies drilled in 61 blocks/mines.

The overall projected performance of exploratory drilling in 2016-17 is given below:

Agency	Target 2016-17 (metre)	Performance of Exploratory Drilling in 2016-17 (Projected)			Achievement Prev. Year: 2015-16 (m)	Growth %
		Achievement (metre)	Achievement (%)	+/- (m)		
A Detailed Drilling Undertaken by CMPDI						
I. Departmental	400000	410000	103%	10000	408069	0%
II. OUTSOURCING						
State Governments	6000	1150	19%	-4850	5276	-78%
MECL (MOU)	256500	275193	107%	18693	247240	11%
Tendering (CIL blocks)	292500	240500	82%	-52000	220551	9%
Tendering (Non-CIL blocks)	145000	136000	94%	-9000	112619	21%
Total Outsourcing	700000	652843	93%	-47157	585685	11%
Grant Total A	1100000	1062843	97%	-37157	993754	7%

B. Promotional Drilling by MECL, GSI, DGM (Nagaland) & DGM (Assam)						
I. COAL SECTOR						
GSI	25000	0	0%	-25000	16116	-100%
MECL	55500	45000	81%	-10500	35216	28%
DGM, Nagaland	1000	700	70%	-300	754	-7%
DGM, Assam	500	0	0%	-500	0	0%
CMPDI	3000	0	0%	-3000	0	0%
SCCL	5000	2500	50%	-2500	0	0%
Total Coal	90000	48200	54%	-41800	52086	-7%
II LIGNITE SECTOR						
GSI	15000	3000	20%	-12000	7953	-62%
MECL	70000	50000	71%	-20000	52305	-4%
Total Lignite	85000	53000	62%	-32000	60258	-12%
Grand Total	175000	101200	58%	-73800	112344	-10%

Note: The Achieved figure given above includes actual for April'16 to Dec.'16 and projected for Jan.'17 to March'17.

In 2016-17, CMPDI is likely to achieve its departmental and overall drilling targets by 103% and 97% respectively. The overall performance in detailed drilling is expected to be better than previous year. Non availability of permission to explore in forest areas & local problems (law & order) have 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 & less deployment of drills and CMPDI could not take up promotional drilling due to its priority in detailed drilling.

Progress of 2D & 3D seismic survey

In 182nd Board Meeting of CMPDI, it was decided to take up 2D seismic survey in 4 blocks by the end of 2014-15. Accordingly, seismic survey was been taken up in Pundi East block, West Bokaro coalfield and Dabor, Central Salanpur A, Central Salanpur Phase-II, Sangramgarh East, Sadhna East, Sadhna South East, Mohanpur East and Mohanpur South East blocks of Raniganj coalfields collectively from the last week of December, 2014. Nearly 50 line km of seismic data was collected in the above 9 blocks. The report of above work has been submitted.

During 2015-16, Seismic Survey was taken up in Patratu A/B/C blocks, S. Karanpura Coalfield and Chandrabila block, Talcher

Coalfield. A total of 19.93 line km and 15.34 line km of survey was covered in respective blocks. Their reports have already been submitted. Seismic work was conducted between January'16 to June'16 in Makri-Barka (E) block, Singrauli Coalfield. The report is in final stage and results have already been discussed for GR preparation.

National Geophysical Research Institute (NGRI) has already conducted 3-D seismic survey in Belpahar block, Ib valley Coalfield under the promotional scheme covering an area of 10 sq. km approx. in association with Geophysicists of CMPDI. Data processing is completed and interpretation is under progress. The report is expected to be completed by March'17.

During current field season 2-D seismic survey work has started in Kewai and Behraband (W) block of Sohagpur Coalfield. Additional two/three blocks will be covered in the current season covering an area of 35 sq km approx. A total of 75,090 metre of geophysical logging, 137 line km of Resistivity profiling, 92 nos. of Sounding and 40 line km of Magnetic survey has been conducted during the period from April to Dec.'16. Approx. 25,000 metre of geophysical logging and 50 line km of Resistivity profiling has been planned for the period from January'17 to March'17.

Geological Reports

In 2016-17, 14 Geological Reports are likely to be prepared on the basis of detailed exploration conducted in previous years. In addition, 8 Revised Geological Reports are also expected to be prepared. The prepared Geological Reports are likely to prove about **4.5 Billion** Tonnes of additional coal resources under Measured (Proven) category.

Coal Resources

Inventory of Geological Resources of coal in India

As a result of exploration carried out to the maximum depth of 1200m by the GSI, CMPDI, SCCL and MECL, a cumulative total of 308.802 Billion tonnes of geological resources of coal have so far been estimated in the Country as on 1.4.2016. The details of State-wise geological resources of coal are given below:

STATEWISE GEOLOGICAL RESOURCES OF COAL IN INDIA (AS ON 01.04.2016)

(Resource in million tonnes)

State	Category-wise Coal Resources (in Million Tonnes)				Total
	Measured (Proved)	Indicated	Inferred (Exploration)	Inferred (Mapping)	
WEST BENGAL	13602.04	13020.51	4906.79		31529.34
BIHAR	0.00	0.00	160.00		160.00
JHARKHAND	42322.68	32300.96	6548.38		81172.02
MADHYA PRADESH	10917.99	12695.98	3293.09		26907.06
CHHATTISGARH	19135.75	34613.7	2286.93		56036.38
UTTAR PRADESH	884.04	177.76	0.00		1061.80
MAHARASHTRA	6207.93	3151.10	2076.67		11435.70
ODISHA	34294.51	33283.57	8317.59		75895.67
ANDHRA PRADESH	0	1149.05	431.65		1580.70
TELANGANA	10128.45	8586.16	2700.2		21414.81
SIKKIM	0.00	58.25	42.98		101.23
ASSAM	464.78	57.21	0.50	2.52	525.01
ARUNACHAL PRADESH	31.23	40.11	12.89	6.00	90.23
MEGHALYA	89.04	16.51	27.58	443.35	576.48
NAGALAND	8.76	0.00	8.60	298.05	315.41
GRAND TOTAL	138087.20	139150.87	30813.85	749.92	308801.84

Source: Geological Survey of India's Inventory of Geological Resources of Indian Coal as on 1.4.16. 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, the resources are upgraded into more reliable 'Proved' category.

The formation-wise and Category-wise coal resources of India as on 1.4.2016 are given in table below:

(In million tonnes)

Formation	Proved	Indicated	Inferred	Total
Gondwana Coals	137493	139052	30764	307309
Tertiary Coals	594	99	799	1493
Total	138087	139151	31563	308802

The Type and Category-wise resources of India as on 1.4.2016 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	13389	12114	1879	27382
-Semi coking	482	1004	222	1708
Sub Total Coking	18485	13816	2101	34403
(B) Non-coking	119008	125236	28663	272907
(C) Tertiary Coal	594	99	799	1493
Grand Total	138087	139151	31564	308802