

STATE REVIEWS



# Indian Minerals Yearbook 2017

(Part- I)

56<sup>th</sup> Edition

**STATE REVIEWS  
(Madhya Pradesh)**

**(FINAL RELEASE)**

**GOVERNMENT OF INDIA  
MINISTRY OF MINES  
INDIAN BUREAU OF MINES**

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**March, 2018**

## MADHYA PRADESH

### Mineral Resources

Madhya Pradesh is the only diamond producing State in the country and is the leading producer of copper conc., diaspore, pyrophyllite, manganese ore, limestone and clay (others). The State hosts the country's 90% diamond, 74% diaspore, 55% laterite, 48% pyrophyllite, 41% molybdenum, 27% dolomite, 19% copper ore, 18% fireclay, 12% manganese and 8% rock phosphate ore resources.

Important mineral occurrences in the State are: **bauxite** in Balaghat, Guna, Jabalpur, Katni, Mandla, Rewa, Satna, Shahdol, Shivpuri, Sidhi & Vidisha districts; **calcite** in Barwani, Jhabua, Khandwa & Khargone districts; **china clay** in Betul, Chhatarpur, Chhindwara, Gwalior, Hoshangabad, Jabalpur, Khargone, Narsinghpur, Raisen, Satna, Shahdol & Sidhi districts; **copper** in Balaghat, Betul & Jabalpur districts; **coal** in Betul, Shahdol & Sidhi districts; **diamond** in Panna district; **diaspore & pyrophyllite** in Chhatarpur, Shivpuri & Tikamgarh districts; **dolomite** in Balaghat, Chhindwara, Damoh, Dewas, Harda, Hoshangabad, Jabalpur, Jhabua, Katni, Mandla, Narsinghpur, Sagar and Seoni districts; **fireclay** in Betul, Chhindwara, Jabalpur, Katni, Narsinghpur, Panna, Sagar, Shahdol & Sidhi districts; **iron ore (haematite)** in Betul, Gwalior, Jabalpur & Katni districts; **limestone** in Balaghat, Chhindwara, Damoh, Dhar, Hoshangabad, Jabalpur, Jhabua, Khargone, Katni, Mandsaar, Morena, Narsinghpur, Neemach, Rewa, Sagar, Satna, Sehore, Shahdol & Sidhi districts;

**manganese ore** in Balaghat and Jhabua districts; **ochre** in Dhar, Gwalior, Jabalpur, Katni, Mandla, Rewa, Satna, Shahdol & Umaria districts; **pyrophyllite** in Chhatarpur, Sagar, Shivpuri & Tikamgarh districts; **quartz/silica sand** in Balaghat, Dewas, Dhar, Jabalpur, Khandwa, Khargone, Morena, Rewa & Shahdol districts; **talc/steatite/soapstone** in Dhar, Jabalpur, Jhabua, Katni, Narsinghpur & Sagar districts and **vermiculite** in Jhabua district.

Other minerals that occur in the State are: **barytes** in Dewas, Dhar, Shivpuri, Sidhi & Tikamgarh districts; **calcareous shales** (used in slate pencil) in Mandsaar district; **felspar** in Jabalpur & Shahdol districts; **fuller's earth** in Mandla district; **gold** in Jabalpur and Sidhi districts; **granite** in Betul, Chhatarpur, Chhindwara, Datia, Jhabua, Panna, Seoni & Shivpuri districts; **graphite** in Betul & Sidhi districts; **gypsum** in Shahdol district; **lead-zinc** in Betul district; **molybdenum** in Balaghat district; **potash** in Panna district; **quartzite** in Sehore district; **rock phosphate** in Chhatarpur, Jhabua & Sagar districts; and **sillimanite** in Sidhi district (Table - 1). The reserves/resources of coal along with various coalfields in Madhya Pradesh are given in Table - 2.

### Exploration & Development

The details of exploration activities conducted by GSI for base metal, iron ore, gold & coal and other various agencies during 2016-17 are furnished in Table - 3.

During 2016-17, National Oil Companies (NOC) continued their operations for exploration of oil and gas in the State.

**Table – 1 : Reserves/Resources of Minerals as on 1.4.2015: Madhya Pradesh**

Mineral	Unit	Reserves				Remaining Resources				Total resources (A+B)		
		Proved STD 111	Probable		Total (A)	Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334		Total (B)	
			STD121	STD122								Feasibility STD211
Barytes	tonne	-	-	-	-	18500	4472	35000	233940	-	291912	291912
Bauxite	'000 tonnes	11979	3313	8299	23591	15084	6013	54484	50590	-	149797	173388
Calcite <sup>#</sup>	tonne	-	5175	215327	35077	160421	20250	180226	358636	97476	1067412	1072587
China clay <sup>#</sup>	'000 tonnes	357	474	902	1733	2882	3774	415	12017	-	20115	21848
Copper												
Ore	'000 tonnes	141950	-	12580	154530	17400	-	550	79389	-	128899	283429
Metal	'000 tonnes	1887.93	-	148.44	2036.37	189.66	-	4.13	867.5	-	1382.13	3418.5
Diamond	carat	959500	-	159	959659	-	-	104118	27645359	-	27749477	28709136
Diaspore <sup>#</sup>	tonne	2380710	341047	2814601	5536358	96241	460808	109792	810667	46068	2025365	7561723
Dolomite <sup>#</sup>	'000 tonnes	23765	10078	18714	52557	33685	102857	295222	1584534	114799	2258839	2311395
Felspar <sup>#</sup>	tonne	-	-	-	10330	-	6610	-	339851	-	356791	356791
Fireclay <sup>#</sup>	'000 tonnes	390	4192	3020	7603	2139	4975	2129	100977	100	119036	126639
Fullers Earth <sup>#</sup>	tonne	-	-	-	-	-	-	-	117200	-	117200	117200
Gold												
Ore												
(Primary)	tonne	-	-	-	-	-	-	5841000	1947000	-	7788000	7788000
Metal												
(Primary)	tonne	-	-	-	-	-	-	6.18	2.22	-	8.4	8.4
Granite <sup>#</sup>												
(Dimen Stone)	'000 cum	-	160	-	160	-	-	-	1885924	108000	1993924	1994084
Graphite	tonne	-	-	-	-	-	-	-	3456660	2280000	5736660	5736660
Gypsum <sup>#</sup>	'000 tonnes	-	-	-	-	-	-	-	69	-	69	69
Iron Ore												
(Haematite)	'000 tonnes	44203	3635	14225	62063	48412	36774	9008	146803	10	267900	329963
Laterite <sup>#</sup>	'000 tonnes	12534	3355	7917	23807	8715	16077	1519	167527	169678	368336	392143
Lead-Zinc												
Ore	'000 tonnes	-	-	-	129	117	-	4006	5930	3150	14841	14841
Lead Metal	'000 tonnes	-	-	-	-	-	-	5.13	5.04	-	36.29	36.29
Zinc Metal	'000 tonnes	-	-	-	5.2	4.71	-	41.93	186.02	101.12	453.74	453.74
Limestone	'000 tonnes	816293	1093490	545321	2455103	419938	498590	830331	4045838	269859	6886754	9341858
Manganese Ore	'000 tonnes	20227	6760	2904	29891	5802	6421	10481	2015	-	27823	57713
Marble <sup>#</sup>	'000 tonnes	-	-	4551	4551	-	-	-	-	-	-	4551

(Contd.)

Table – 1 (Concl.)

Mineral	Unit	Reserves				Remaining Resources				Total resources (A+B)				
		Proved STD 111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331		Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)
			STD121	STD122			STD221	STD222						
Molybdenum														
Ore	tonne	-	-	-	-	-	-	-	-	8000000	-	8000000	8000000	
Contained														
MoS <sub>2</sub>	tonne	-	-	-	-	-	-	-	-	5020	-	5020	5020	
Ochre <sup>#</sup>	tonne	1605342	194757	1895247	3695346	681904	1653225	5402710	356344	2577575	3732142	749250	15153150	18848495
Potash	Million tonnes	-	-	-	-	-	-	-	-	1206	-	-	1206	1206
Pyrophyllite <sup>#</sup>	tonne	9786485	2242501	1907116	13936102	1860354	2976581	2738198	520801	3294772	2984100	248405	14623211	28559313
Quartzite <sup>#</sup>	'000 tonnes	-	-	-	-	-	-	-	-	-	832	-	832	832
Quartz-														
Silica Sand <sup>#</sup>	'000 tonnes	129	30	1781	1940	516	-	920	791	316	2717	-	5261	7201
Rock														
Phosphate	tonne	5999399	5179	1492370	7496948	6460616	14981336	15702042	-	2730000	10629258	50625	50553877	58050825
Shale <sup>#</sup>	'000 tonnes	55	9	2	66	295	-	1459	-	-	33	-	1787	1853
Sillimanite	tonne	-	-	-	-	-	-	-	-	-	0	101600	101600	101600
Silver														
Ore	tonne	-	-	-	-	-	-	-	-	2096000	1120000	-	3216000	3216000
Metal	tonne	-	-	-	-	-	-	-	-	150.61	9.25	-	159.86	159.86
Talc-Steatite-														
Soapstone <sup>#</sup>	'000 tonnes	185	20	79	283	179	378	1609	-	1679	6107	-	9952	10235
Vermiculite	tonne	-	-	-	-	197	-	66	-	-	66	-	329	329

Figures rounded off

Note: The proved and indicated balance recoverable reserves of coal bed methane (CBM) in the State as on 01.04.2016 were 32.13 billion cu m  
# Declared as minor mineral vide Gazette Notification dated 10.02.2015

## Minor Mineral before Gazette Notification dated 10.02.2015

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**Table – 2 : Reserves/Resources of Coal as on 1.4.2017 : Madhya Pradesh**

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
<b>Total</b>	<b>11268.69</b>	<b>12759.67</b>	<b>3644.84</b>	<b>27673.20</b>
Johilla	185.08	104.09	32.83	322.00
Umaria	177.70	3.59	–	181.29
Pench-Kanhan	1476.88	970.34	733.05	3180.27
Pathakhera	290.80	88.13	68.00	446.93
Gurgunda	–	84.92	53.39	138.31
Mohpani	7.83	–	–	7.83
Sohagpur	1856.81	5747.90	312.80	7917.51
Singrauli	7273.59	5760.70	2444.77	15479.06

*Source: Coal Directory of India, 2016-17***Table – 3 : Details of Exploration Activities in Madhya Pradesh, 2016- 17**

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
<b>GSI</b>							
<b>Base Metal (Cu, Pb &amp; Zn)</b>							
Betul	Biskhan block	-	-	11	1589.80	-	During G2 stage, general exploration in this area for basemetals mineralisation, a total 300 m strike length of potential zone was taken up by drilling 11 boreholes. Nine boreholes intersected sulphide mineralisation. Sulphide mineralisation occurs in the form of dissemination, streaks, stringers and thin films of pyrite, sphalerite and occasional chalcopyrite. The visual estimate varies from 1% to 2% sulphides. Analytic results of 2 boreholes show presence of a 29.5 m thick Zn zone with average 1.43% Zn at 1% cut-off.
	Ghisi block	-	-	13	972	-	G2 stage general exploration for basemetals associated polymetallic mineralisation has been carried out by along with drilling , a total 500 m strike length was taken up by drilling. The main host rock for sulphide mineralisation is garnetiferous quartz – muscovite – biotite – chlorite schist. The sulphide mineralisation occurs in the form of disseminations, specks, streaks, stringers and thin bands of pyrite and sphalerite along with occasional chalcopyrite. The mineralisation is not uniform and is patchy in nature. In general, visual estimate shows 1 to 1.5% sulphides with some patches of 2 to 3% sulphides in some boreholes. The chemical analysis of boreholes indicates the presence of one or two zone with average 0.71% X 4.35 m zinc, 0.2% X 5.0 m, 0.37% X 2.20 m, 1.07% X 9.18 m and 0.57% X 12.40 m.

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Table – 3 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Betul	Jangaltheri block Betul Belt	-	-	6	1025.6	-	G-2 stage general exploration for base metals mineralisation in this belt has been carried out. A total of 400 m strike length was taken up for G-2 stage exploration and 6 boreholes were drilled comprising a total of 1025.6 m drilling. All boreholes intersected sulphide mineralisation through the depth & intensity of mineralisation vary from borehole to borehole. The sulphide mineralisation occurs in the form of disseminations, specks, streaks, stringers and thin bands of pyrite & sphalerite along with occasional chalcopyrite. The mineralisation is not uniform & is patchy in nature. Visual estimate shows sulphides varies from 1 to 1.5%. The chemical analysis of borehole indicates presence of two to four zones of zinc enrichment of 0.050% X 1.12 m, 0.59% X 2.49 m, 1.21% X 2.24 m, 1.40% X 9.14 m, 0.69% X 1.87 m, 0.67% X 4.88 m, 0.55% X 3.00 m and 0.54% X 13.62 m.
<b>Gold</b> Tikamgarh	Bundelkhand granite complex, Gotet area	-	-	-	-	-	G4 stage search for gold and associated sulphide mineralisation has been carried out in this area. Mineralisation in the mapped area is represented either by vein or disseminated type, which includes minerals pyrite, chalcopyrite, malachite, bornite, covellite, magnetite, haematite, pyrrhotite and sphalerite. Profuse sulphide mineralisation is confined within the hornblende granite, which is again controlled by NW-SE and E-W trending shear zone. Mineralisation and its close association with quartz veins and alterations indicate its hydrothermal origin. Field evidence shows that the hydrothermal alteration and sulphide mineralisations are contemporaneous in nature. Alteration associated with mineralisation is manifested by propylitic alteration which is random and sporadic in space. Besides, advanced argillic alteration characterised by pyrophyllite and diaspore is also evidenced in some of the quartz reefs and quartz vein. In mapped area, incidences of mineralisation are evidenced and values of different elements do not favour any further major exploration activity in the area.

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Table – 3 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Katni	Imaliya block Sleemanabad area	-	-	6	963.53	-	G2 stage general exploration for gold, silver and basemetal has been carried out in this area. Out of 6 boreholes drilled, two were drilled at 60 m, one at 90 m and three at 120 m of vertical intersection of potential zone. In Imaliya block mineralisation mainly occurs in two types: one is in massive sulphide form and another in vein/veinlets (Paper thin to cm thick). Massive sulphide mineralisation was found in 40° to 50° with respect to core axis while vein occurs in parallel or at 70° to 80° with respect to core axis. Visually, pyrite, chalcopyrite, arsenopyrite, bornite and sphalerite were identified in the cores. Gold mineralisation is hosted by dolomite with quartz veins/veinlets containing sulphide minerals. Analytical results of 8 core samples revealed values of gold (Au) between 2 and 0.27 ppm (analysed by AAS). Ag varies between 50 and 15 ppm.
Sidhi	Chakariya block	-	-	6	855.00	-	G2 satge general exploration for gold mineralisation has been carried out in this block followed by drilling. In this block, drilling was carried out with two 1 <sup>st</sup> level boreholes of close spaced drilling (50 m borehole interval) and five 2 <sup>nd</sup> level boreholes of 100 m vertical intersection. A total of 50 cu.m trenching was carried out along the azimuth of boreholes to confirm surface extension of the mineralised zone. The associated sulphide minerals with gold mineralisation include arsenopyrite, pyrite, galena, chalcopyrite and pyrrhotite (at places) as primary sulphides and scorodite as alteration product of arsenopyrite, which has been used as pathfinder mineral for gold. The Au values in 'scorodite' bed rock samples are promising with Au values ranging from 2.06 to 9.16 ppm. Whereas Au values in grey quartz vein range from 0.72 to 2.39 ppm. The value of Cu ranges from 5 to 760 ppm, Pb

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Table – 3 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							from 5 to 210 ppm, Zn from 5 to 60 ppm, Co from 5 to 50 ppm, Ag from 0.5 to 10 ppm and Ni from 5 to 45 ppm.
Singrauli	Amalihwa-Hathipathar Kapurdei area	-	-	-	-	-	G4 stage reconnaissance survey for gold and associated sulphide mineralisation has been carried out in this area by mapping. Two WNW-ESE trending sulphide mineralised zones were delineated in the mapped area in rocks of Parsoi Formation of Mahakoshal Group. Vein type and disseminated style of mineralisation were noted in the mineralised zones. Arsenopyrite, scorodite, galena, pyrite and chalcopyrite are the principal sulphide minerals found in the mineralised zones. Primary ore textures related to open space filling or deposition are common. The propylitic alteration of host rocks can be traced for a few meters around the mineralised quartz veins with no distinct zonation.
<b>Iron ore</b>							
Gwalior	Motijhil- Akbarpur Area	1:12500 1:2000	10 1.5	- -	- -	- -	G3 level preliminary investigation for iron ore was carried out in this area along with detailed mapping and large-scale mapping. About 1 km strike length with 600 m width of iron ore mineralisation was delineated on the basis of detailed geological mapping and sampling in Akbarpur block. In Motijhil block the delineated iron ore mineralisation was of 800 m strike length & 400 m width. Drilling has been completed. Ore zones were identified with cut-off grade of 30% based on the visual estimation and partial analytical results of core samples.
Jabalpur	Sihora- Gosalpur area	1:12500 1:5000	100 0.5	- -	- -	250 -	G4 stage investigation for iron ore was taken up in Sihora-Gosalpur area. Total 150 bedrock samples (BRS), 5 petro chemical samples (PCS) and 50 pit trench samples (PTS) through 50 cu.m trenching were collected to identify the possible existence of the iron ore. Analytical results received so far show average iron content ranging from 40-42%. Five BRS samples of suspected manganese mineralisation collected from brecciated zone (located near Tola village) show manganese values between 28.44 and 59.62%.



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Table – 3 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Jabalpur Katni, Rewa, Sidhi Shahdol and Singrauli	Mahakoshal Belt	-	-	-	-	-	G4 stage reconnaissance survey was taken up for Iron ore in this belt. In some areas viz. Sleemnabad, Jhinna Pipariya, Kuan and Rajarwara, LSM and detailed mapping was recommended to trace the BIF, manganese occurrences and bauxite deposits in selective areas for delineating primary and secondary enrichment beneath the lateritic cap zone.
Tikamgarh	Dhaurra- Urdaurra Area	1:12500 1:4000	2 1.5	2 -	207.0 -	- -	G4 stage reconnaissance survey for iron ore by large- scale mapping and detailed mapping along with a total of 207 m drilling in two scout boreholes was carried out to study the subsurface extension of iron ore mineralisation. There are 3 major bands of BIF occurring as enclaves within gneisses near Dhaukan-Dhaurra-Urdaurra villages. The true thickness of mineralised zones varies from 65.22 to 38.79 m and Fe content varies between 40 and 57% in the analysed core samples.
<b>Coal</b> Chhindwara	Dhorakuhi sector, Pench valley Coalfield,	-	3.0	4	1663.45	-	G3 stage exploration for coal was carried out. A total of 1663.45 m drilling was carried out in four boreholes. Five regional Barakar coal seams (I to V in descending order) have been intersected between the depth ranges from 347.56 to 409.03 m. The cumulative coal seam thickness is 12.92 m. Thickness of individual coal seam varies from 0.64 (Seam-II) to 5.05 m (Seam-IV).
Shahdol	Lamru block Sohagpur Coalfield,	1:10000	5.0	9	2712.60	-	G2 stage exploration for coal was carried out in this block. Barakar Formation is the coal bearing horizon in the Lamru block of Sohagpur Coalfield. Four regional Barakar coal seams (I to IV in ascending order) along with few local seams have been intersected within the depth of 105.85 to 288.00 m with cumulative coal thickness ranging from 0.05 to 7.55 m. In the western part of the area, regional Seam-III is the thickest and most persistent seam. However, Seam II has attained considerable thickness particularly in the southern part of the block and occurs as the thickest seam.

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Table – 3 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Shahdol	Kirhai block Sohagpur Coalfield,	1:10000	5.0	-	2698.85	-	G2 stage exploration for coal was carried out in this block. Mapping reveals that the major part of the block is covered with calcareous sandstone of Lameta Formation. Coal bearing horizon in Kirhai block is restricted within Barakar Formation. Three regional Barakar coal seams along with two local seams have been intersected within the depths of 135.40 to 278.50 m with cumulative coal thickness ranging from 0.55 m to 5.70 m. Seam-II is the most important regional Barakar coal seam in terms of thickness and regional persistency.
Singrauli	Pachaur block Sohagpur Coalfield,	1:10000	3.0	-	3132.20	-	G2 stage exploration for coal was carried out in this block. Pachaur block is located in the north-eastern part of main sub-basin of Singrauli Coalfield in Singrauli district. The area is covered by rocks of Raniganj formation. Barren Measures are found to be 249.14 to 278.40 m thick while Barakar Formation shows a maximum of 400.26 m thickness. The middle part of the entire Barakar sequence is the most important as it contains all the regional coal seams of economic importance in the basin. A total of 3132.20 m drilling was done. An area of 3 sq km has been covered by large-scale mapping (RF 1:10,000). The regional exploration has established development of four regional (R-I to R-IV) and a few local Raniganj coal seams. The thickness of coal seams ranges from less than a metre to 5.77 m. The dip extension of thicker coal seam (Seam R-II) has been established for a distance of about 3.5 to 4 km. Barakar Formation contains thicker and important coal seams. Within Barakar Formation, seven regional (Seam I to VII) and a few local coal seams ranging in thickness from less than a metre to 13.90 m (Seam VI) were intersected between depth range of 407.96 (Seam VII) and 763.9 8 m (Seam-I). Barakar Seam VI is the most important seam in terms of its thickness and regional persistency. The strike and dip

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Table – 3 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
extension of Seam VI has been established for a distance of about 4.5 to 5 km and 2 to 2.5 km respectively.							
<b>Manganese</b>							
Balaghat	western block of ukwa	-	-	6	1071.35	-	G2 level general exploration was carried out for manganese mineralisation in this block. In Western Ukwa block, drilling was done with 6 boreholes for second and third level to know strike and depth continuity of manganese horizon. A total of 10.015 m thick manganese ore horizon was intersected in 6 different boreholes with thickness of ore horizon varies from 0.15 m to 3.61 m.
<b>Vanadium</b>							
Katni	Ganeshpur-Rohaniya-Salhana area,	1:10000	100	-	-	-	G4 level reconnaissance survey for vanadium and basemetal was taken up in Mahakoshal group of rocks in Ganeshpur-Rohaniya-Salhana area, Katni district. Mineralisation in the area is mainly surficial in nature. Cubes of magnetite observed on the surface of dolomite, pyrite cubes, flakes of chalcopyrite, malachite staining, epidotisation and vug structures were also noticed. Dolomite bands were identified. However, no prominent evidence of titaniferrous magnetite mineralisation was found.
<b>Molybdenum</b>							
Chhatarpur	Sandna-Garha area,	-	-	-	-	-	G4 level survey for molybdenum and related sulphide mineralisation was taken up in Bundelkhand Granitic complex in Sandna – Garha area, Chhatarpur district. Molybdenite mineralisation is characterised by studded orange yellow hallows which is due to oxidation followed by leaching of molybdenite. Silver colour chunks of molybdenite along with orange yellow hallow had been noticed within medium grained granite near Bendari village. Disseminated molybdenite within medium grained granite were also noticed near Bendari village.
<b>Limestone</b>							
Jhabua	Khari-Talawadi-Kherli-Mongra, Block - I & Kherira-Sejawada-Sanda-Mathana Block - II	1:50000 1:10000	200 100	- -	- -	- -	G4 stage reconnaissance was carried out in parts of Bagh basin. Block-I covers 70 sq.km area and divided into five sectors. The central part of block -I namely Khari-Takari, Dabri-Talawadi-Bamanbardi and Kherli-

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Table – 3 (Concl.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Mogra sectors is probably good host of limestone in the area with thickness varying from 1 to 15 m. Block-II covers about 33 sq km area and not very promising.
Satna	Naubasta- Kolard Limestone block	1:1000	15	5	294.00	111	Estimated about 98.625 million tonnes of limestone resources with CaO 44.61%, MgO 2.35%, SiO <sub>2</sub> 10.52%, Al <sub>2</sub> O <sub>3</sub> 1.64%, Fe <sub>2</sub> O <sub>3</sub> 1.32%, & LOI 37.41% under 334 category.
	Jamodi- Mahanna block	1:10000	31	5	274.00	106	Estimated about 297.317 million tonnes of limestone resources with CaO 44.66%, MgO 1.78%, SiO <sub>2</sub> 10.82%, Al <sub>2</sub> O <sub>3</sub> 2.19%, Fe <sub>2</sub> O <sub>3</sub> 1.45%, & LOI 36.82% under 334 category.
	Gunchihai block	1:10000	6.5	5	262.00	104	Estimated about 116.831 million tonnes of limestone resources with CaO 45.48%, MgO 2.31%, SiO <sub>2</sub> 10.13%, Al <sub>2</sub> O <sub>3</sub> 2.09%, Fe <sub>2</sub> O <sub>3</sub> 1.38%, & LOI 37.91% under 334 category.
<b>Glauconite</b> Singrauli	Bichhiya block	-	2	-	-	149	During G3 stage preliminary exploration for glauconite shale/sandstone, details mapping of about 2 sq km have been carried out in Bichhiya Block. The approximate cumulative thickness of glauconitic shale only, ranges from 0.74 to 5.48m with an average of 3.11 m. About 149 core samples were collected for estimation of grade of mineralised zone.

### Production

Madhya Pradesh was the sole producer of diamond.

The value of minor minerals production was estimated at ` 1,097 crore for the year 2016-17.

The number of reporting mines in Madhya Pradesh was 198 in 2016-17 in case of MCDR minerals.

### Mineral-based Industry

The present status of each mineral-based industry is not readily available. However, the important large and medium-scale mineral-based industries in organised sector in the State are furnished in Table-5.

## STATE REVIEWS

**Table – 4 : Mineral Production in Madhya Pradesh, 2014-15 to 2016-17  
(Excluding Atomic Minerals)**

(Value in ` '000)

Mineral	Unit	2014-15			2015-16			2016-17 (P)		
		No. of mines	Quantity	Value	No. of mines	Quantity	Value	No. of mines	Quantity	Value \$
<b>All Minerals</b>		<b>398</b>		<b>141886741</b>	<b>280</b>		<b>161371536</b>	<b>268</b>		<b>27339996</b>
Coal	'000t	70	87609	111478200	70	107714	132254900	70	105013	-
Bauxite	t	23	831899	526735	22	684288	479401	18	658375	501600
Copper Ore	t	-	2378912	-	-	2536580	-	-	2415330	-
Copper Conc.	t	1	57551	2480829	1	79281	3315629	1	68187	3023674
Iron Ore	'000t	19	4193	2464797	19	2447	1475651	15	1730	677950
Manganese Ore	t	44	877994	5219983	45	766776	3334907	42	648132	5051691
Phosphorite	t	3	79264	67263	3	66260	55602	3	68803	58240
Calcite <sup>#</sup>	t	1	22	6	-	-	-	-	-	-
Clay (others) <sup>#</sup>	t	-	365273	50420	-	-	-	-	-	-
Diamond	crt	2	36107	613504	2	36044	621441	2	36516	639596
Diaspore <sup>#</sup>	t	-	4717	9652	-	-	-	-	-	-
Dolomite <sup>#</sup>	t	49	542637	127068	-	-	-	-	-	-
Fireclay <sup>#</sup>	t	8	22642	3593	-	-	-	-	-	-
Kaolin <sup>#</sup>	t	2	10200	1377	-	-	-	-	-	-
Laterite <sup>#</sup>	t	14	589835	135172	-	-	-	-	-	-
Limestone	'000t	127	39530	7024166	118	39430	8868182	117	35843	6421422
Ochre <sup>#</sup>	t	9	70422	17329	-	-	-	-	-	-
Pyrophyllite <sup>#</sup>	t	18	115655	107321	-	-	-	-	-	-
Quartz <sup>#</sup>	t	1	3450	985	-	-	-	-	-	-
Sand (others) <sup>#</sup>	t	2	16037	1540	-	-	-	-	-	-
Shale <sup>#</sup>	t	4	384008	5301	-	-	-	-	-	-
Talc Steatite										
Soapstone <sup>#</sup>	t	1	1828	933	-	-	-	-	-	-
Minor Minerals <sup>@</sup>		-	-	11550567	-	-	10965823	-	-	10965823

*Note: The number of mines excludes minor minerals**\* Associated with pyrophyllite**@ Figures for earlier years have been repeated as estimates, wherever necessary, because of non-receipt of data**# Declared as Minor Mineral vide Gazette Notification dated 10.02.2015**\$ Excludes fuel minerals*

## STATE REVIEWS

**Table – 5 : Principal Mineral-based Industries  
in Madhya Pradesh**

Industry/plant	Capacity (’000 tpy)
<b>Aluminium/Alumina</b>	
Hindalco Industries Ltd, Mahan Aluminium, Bargwan, Dist. Singrauli.	360 (Aluminium)
<b>Asbestos Products</b>	
Everest Building Products Ltd, Kymore.	NA
Kalani Industries Pvt. Ltd, Pitampur, Dhar.	NA
Ramco Industries Ltd, Maksi, Dist. Shajapur.	NA
<b>Cement</b>	
ACC Ltd, Kymore, Dist. Katni.	2200
Birla Corpn. Ltd (Satna Cement Works & Birla Vikas Cement), Satna.	2200
CCI Ltd, Nayagaon, Dist. Neemuch.	400
Heidelberg Cement (I) Ltd, Narsingarh, Dist. Damoh.	1030
Jaiprakash Power Ventures, Singrauli (G).	2000
Jaypee Rewa Cement Plant, Dist. Rewa.	3000
Jaypee Bela Cement Plant, Dist. Rewa.	2600
Jaypee Cement, Sidhee.	2300
KJS Cement, Rajnagar, Dist. Satna.	960
Maihar Cement, Maihar, Dist. Satna.	4200
Prism Cement Ltd (Unit I & II), Satna.	5600
Reliance Cement Pvt Ltd, Maihar, Dist. Satna.	3000
Ultratech Cement, Vikram Cement Plant, Khor, Dist. Neemuch.	3000
<b>Ceramic</b>	
Roca Bathroom Products Ltd, Dewas.	NA
Govind Tiles Pvt Ltd, Garra, Dist. Balaghat.	NA
<b>Fertilizer</b>	
Agro Phos. (India) Ltd, Dewas.	45 (SSP)
Arihant Ferts. & Chems. India Ltd, Kanawati, Neemuch.	66 (SSP)
Basant Agro Tech (India) Ltd, Jawad, Neemuch.	45 (SSP)

(Contd.)

Table-5 (Concltd.)

Industry/plant	Capacity (’000 tpy)
Coromandel International Ltd (Formerly Liberty Urvarak Ltd), Nirmani Khargone.	100 (SSP)
Indra Industries Ltd (Formerly Swastik Ferts & Chems Ltd), Indore, Dhar.	66 (SSP)
KMN Chemicals & Fertilizers Ltd, Diwanganj, Raisen.	60 (SSP)
Khaitan Chemical & Fertilizers Ltd, Nimrani, Dist. Khargone.	400 (SSP) 115.5 (H <sub>2</sub> SO <sub>4</sub> )
NFL, Vijaiapur (Unit I & II), Dist. Guna.	2066.1 (Urea)
Krishna Phoschem Ltd, Meghnagar, Jhabua.	120 (SSP)
Madhya Bharat Agro Products Ltd, Rajoa, Sagar.	60 (SSP)
Madhya Bharat Phosphate Pvt. Ltd (Unit I), Diwanganj, Sanchi, Raisen.	132 (SSP)
Madhya Bharat Phosphate Pvt. Ltd (Unit II), Meghnagar, Jhabua.	165 (SSP)
Mexican Agro Chemical Ltd (Formerly Asha Phosphates Ltd), Jaggakhedi, Mandsaur	60 (SSP)
Mukteswar Fertilizers Ltd, Narayankhedi, Ujjain.	60 (SSP)
Rama Phosphates Ltd, Indore.	165 (SSP)
Suman Phosphates and Chemicals Ltd, Indore.	330 (SSP)
Varun Fertilizers Pvt. Ltd, Dewas.	100 (SSP)
<b>Ferro-alloys</b>	
Crescent Alloys Pvt. Ltd, Seoni.	4.5
Jalan Ispat Castings Ltd, Meghnagar, Dist. Jhabua.	12
MOIL Ferro Manganese Plant, Bharveli, Dist. Balaghat.	10
<b>Petroleum Refinery</b>	
Bharat Oman Refineries Ltd, Bina, Dist. Sagar.	6000
<b>Refractory</b>	
ACC Refractories, Katni.	65
Premier Refractories India Pvt. Ltd, Katni.	12.9

G; Grinding Unit

*Note: Data not readily available for fertilizer and cement industries on respective websites, is therefore taken from Indian Fertilizer Scenario, 2016/FAI Statistics, 2015-16 and Survey of Cement Industry & Directory, 2016, respectively*