

STATE REVIEWS



Indian Minerals Yearbook 2018

(Part- I)

57th Edition

**STATE REVIEWS
(Uttar Pradesh)**

(FINAL RELEASE)

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

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UTTAR PRADESH

Mineral Resources

The State is the principal holder of country's andalusite & diaspore resources and possesses 78% andalusite, 37% diaspore, 17% sillimanite and 10% pyrophyllite. Important minerals occurring in the State are: **coal** in Singrauli coalfields, Sonbhadra district; and **diaspore & pyrophyllite** in Hamirpur, Jhansi, Lalitpur and Mahoba districts. Naini area of Allahabad district contains high quality **silica sand**, an important source of glass sand, containing 98% SiO₂ and a very low Fe₂O₃ is found in Shankargarh, Lohargarh in Allahabad district and also Bargarh in Banda district. Silica sand is also found in Aligarh and Chitrakoot districts.

Other minerals that occur in the State are **andalusite** and **calcite** in Mirzapur district; **bauxite** in Banda, Varanasi & Lalitpur districts; **china clay & dolomite** in Banda and Sonbhadra districts; **felspar** in Jhansi district; **fireclay, limestone, potash & sillimanite** in Sonbhadra district; **ochre** in Banda district; **granite** in Banda, Hamirpur, Lalitpur & Mahoba districts; **iron ore (haematite)** and **rock**

phosphate in Lalitpur district (Table -1). The reserves/resources of coal along with details of coalfield are provided in Table-2.

Exploration & Development

During 2017-18, the State DGM and GSI had conducted exploration activities. GSI carried out exploration for iron ore, rare-earth element (REE), gold, rock phosphate & andalusite etc. in Sonbhadra, Jhansi & Hamirpur districts. The details of exploration carried out by GSI and DGM in the State are furnished in Table-3.

Production

Coal, limestone and sulphur were the mineral items produced in Uttar Pradesh during 2017-18.

The value of minor minerals production was estimated at ` 5,614 crore for the year 2017-18.

The number of reporting mines in Uttar Pradesh was 2 in 2017-18 in case of MCDR minerals (Table-4).

Mineral-based Industry

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

Table -2 : Reserves/Resources of Coal as on 1.4.2018 : Uttar Pradesh

(In million tonnes)				
Coalfield	Proved	Indicated	Inferred	Total
Singrauli	884.04	177.76	-	1061.80

Source: Coal Directory of India, 2017-18

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

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						
Andalusite	'000 tonnes	-	-	-	-	-	-	-	-	-	24200	24200	24200	
Bauxite	'000 tonnes	-	-	-	-	-	-	10390	500	8018	-	18908	18908	
Calcite [#]	tonne	-	-	-	-	-	-	-	-	11000	-	11000	11000	
China clay [#]	'000 tonnes	-	-	-	-	-	-	11600	3447	10018	-	25065	25065	
Diaspore [#]	tonne	861653	543478	940945	2346076	18548	10662	19855	545	234566	-	284175	2630251	
Dolomite [#]	'000 tonnes	-	-	-	-	-	12622	-	3500	66230	-	82352	82352	
Felspar [#]	tonne	-	-	-	-	-	-	-	-	200000	-	200000	200000	
Fireclay [#]	'000 tonnes	-	-	-	-	-	-	-	-	3221	-	3221	3221	
Granite [#]														
(Dimension Stone)	'000 cu m	-	-	-	-	-	-	-	-	494819	-	494819	494819	
Iron ore														
(Haematite)	'000 tonnes	-	20000	-	20000	-	-	-	-	38000	-	58000	58000	
Limestone	'000 tonnes	-	12849	12849	33360	129180	38375	142763	40000	31200	-	414878	427727	
Ochre [#]	tonne	-	-	-	-	-	-	25000	35000	10000	-	70000	70000	
Potash	million tonnes	-	-	-	-	-	-	-	-	198	685	883	883	
Platinum Group of metals	tonne	-	-	-	-	-	-	-	0.01	-	-	0.01	0.01	
Pyrophyllite [#]	tonne	3598112	770113	1233511	5601736	132189	213979	378450	66512	1070930	43200	2118782	7720518	
Quartz-														
Silica sand [#]	'000 tonnes	445	19825	15144	35413	9415	30012.83	7048.4	6290	51590	-	105314	140727	
Rock														
Phosphate	tonne	-	-	-	-	-	432898	3118586	740000	21481960	-	25773444	25773444	
Sillimanite	tonne	-	-	-	-	-	-	-	2100000	9350000	-	11450000	11450000	

Figures rounded off

Declared as Minor Minerals vide Gazette Notification dated 10.02.2015

Minor Mineral before Gazette Notification dated 10.02.2015

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Table – 3: Details of Exploration Activities in Uttar Pradesh, 2017-18

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI Iron ore Sonbhadra	Mahakoshal Group Block 'A' Bharhari area	1:2000	1.5	3	307.25 m	-	Preliminary exploration for iron ore was carried out in Mahakoshal Group, Block 'A' Bharhari area in Sonbhadra district. Exploration involved detailed mapping of 1.5 km ² on 1:2000 scale and drilling. The rock types exposed in extended Block 'A' are variegated phyllite, felsic tuff, Banded Haematite Chert / Jasper (BIF), banded ferruginous phyllite and dolerite dykes. The strike length of BIF band is 2.62 km. The BIF band exposed at the hilltop has thickness of 8-25 m. A total of 307.25 m drilling were carried out in 3 boreholes, i.e., SBE-1, SBE-2 and SBE-3. A 0.80 m fractured BIF was intersected at 67.90 m depth.
REE and tungsten	Gulajharia-Sagoban area	1:25000	135	-	-	-	Reconnaissance survey for REE and tungsten mineralisation in Dudhi granitoid complex was taken up. Large-scale mapping of 135 sq.km on 1:12500 scale was carried out. The major lithological units identified are K-felspar granite gneiss, biotite granite, K-felspar granite, unakite, amphibolite and marble. The younger intrusives occur in the form of milky white quartz vein and pegmatite vein. The K-felspar granite gneiss is pink colour, deformed, rich in K-felspar porphyroclasts, exposed in most part of study area. Pegmatite veins in K-felspar granite gneiss is pink colour, medium to coarse-grained rich in K-felspar while pegmatites in sheared biotite granite is light grey colour, very coarse to pegmatitic nature. The columbite grains are associated with pegmatite vein and may be a source for REE and associated rare metals in the study area. The pegmatite veins in Kudri, Anjangira & Deohar area

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Table – 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
PGE							
(Ni and Co)							
Sonbhadra	Garda-Bhitri area	1:25000	125	-	-	-	show yellowish green fluorescence under UV light that may be powellite. Reconnaissance survey for PGE mineralisation and associated Ni and Co was carried out in Jungel ultramafics around Garda-Bhitri area, Sonbhadra district. The survey involved large scale mapping of 125 sq. km on 1:12500 scale. The area is mainly represented by basalt, vesicular/ amygdular and olivine-rich basalts, agglomerate and lamprophyre along with sporadic occurrence of serpentinite and ultramafics. The olivine-rich basalt in Harsadand and Baheradand, the ultramafic body near Baheradand, serpentinite in Jarkarhwa and gabbro in Sobna-Bhitri are the mafic and ultramafic lithounits which have been mapped and sampled for PGE mineralisation.
Gold							
	Kumphiya-Haripur area	1:12500	125	-	-	-	Reconnaissance survey was taken up for gold mineralisation in southern and western extension of the Sonapahari prospect, Kumbhiya-Haripur area. An area of 125 sq. km was mapped on 1:12,500 scale. The desultory presence of sulphide minerals such as pyrite, bornite and galena along with the leaching of sulphide minerals, presence of yellow streaks in quartz veins as well as the boxwork structures were noticed in phyllites.
	Kishunpurva area	1:12500	100	-	-	-	Reconnaissance survey was taken up for gold mineralisation in Kishunpurva area. The area was covered by large scale mapping of 100 km ² area on 1:12,500 scale. The surface manifestation of mineralisation in the area was seen in form of brown, green and black oxidation surfaces in void space of quartz veins along with the specks

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Table – 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							of pyrite, chalcopyrite, bornite and arsenopyrite in smoky quartz veins.
	Gurmura-Gurbani area	1:12500	110	-	-	-	Reconnaissance survey was taken up for gold mineralisation in Gurmura-Gurbani area. The survey involves large-scale mapping of 110 km ² on 1:12500 scale. The area comprises of phyllites and meta-greywacke. The phyllites are intruded by milky white/smoky quartz veins/reefs and cut across by dolerite dykes. Signatures of mineralisation are found in form of scorodite, specks of galena, arsenopyrite, pyrite and arsenian-pyrite in quartz veins/reefs. Scorodite is found in quartz veins/reefs and occurs as fracture and joint filling.
	Amarsoti area	1:12500	-	-	-	-	Reconnaissance survey for gold mineralisation was carried out in Phaphrakund-Amarsoti area. The study involves large scale mapping on 1:12500 scale, along with bedrock sampling, pitting and trenching. The area comprises of variegated phyllite, chlorite phyllite with thin chert bands, meta-greywacke, impersistent quartzite bands, all intruded by quartz and dolerite dykes. Scorodite, a path finder of gold, was seen at 08 locations as fracture/cavity filling in the quartz veins, around Jurra, Obra village, Mangrauha and Kondari. Arsenopyrite and gossanised quartz veins was also noted north-west of Sonpahari.
Andalusite	'C' Block of Pulwar area	1:2000	1.50	9	500.00	-	G3 stage preliminary exploration for andalusite was carried out in 'C' Block of Pulwar area, Mahakoshal Group. The litho units reported in the area are

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Table – 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							andalusite-bearing phyllite and intrusives viz. leucogranite and quartz-tourmaline/ quartz veins, pegmatite veins and dolerite dyke showing andalusite crystals in the rocks. Study of the drill cores and surface investigations suggest that andalusite mineralisation is present from the surface to 35 m vertical drilled depth and the host rock is andalusite-bearing phyllite.
	'D' Block of Pulwar area	1:2000	1.50	-	500.00	-	G3 stage preliminary exploration for andalusite in Pulwar area of Mahakoshal Group was carried out. The investigated area showed exposure of alumina-rich meta sediments in form of andalusite bearing phyllites and/or schists. The andalusite crystals occur as porphyroblasts within a matrix of mica, chlorite and quartz within the phyllites or schists.
Directorate of Geology & Mining							
Andalusite							
Lalitpur	Solda-Vudana area	1:25000	61.87	-	-	309	G4 level exploration was taken up with the objections to explore iron ore deposit in sthis area. An area of about 61.87 sq.km has been covered under geological traversing and the same was mapped on 1:12500 scale. About 121 cu.m pitting and trenching work was done in 4 pits and one trench and about 0.56 sq.km area has been covered by Magnetic and S.P. survey. Total 309 samples were collected for chemical analysis. About 10 km ² area seems to be potential for detailed iron ore exploration.
PGE							
Lalitpur	Ikauna area	1:1000	0.4	-	-	-	DGM, UP conducted exploration work in Ikauna area, Lalitpur district. An area of 0.4 km ² was mapped on 1:1000 scale with

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Table – 3 (Contd)

Agency/ Mineral/ estimatedDistrict	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources
		Scale	Area (sq km)	No. of boreholes	Meterage		
							digging of two trenches of dimensions 18 m x 1.0 m x 1.5 m and 23 m x 1.0 m x 1.5 m and analysed 336 nos samples. PGE is hosted by peridotite & talc - actinolite schist over a strike length of 2 km with depth persistence of 60 m in Ikauna area. A borehole was drilled to a depth of 180 m and estimated about 7.0 million tonnes of PGE ore (@ 0.49 ppm PGE) under indicated category. In eastern extension of Ikauna ultramafic tract, geological mapping of 36 km ² on 1:12500 scale was carried out and G4 level exploration is in progress.
Sonbhadra	Hardi area	1:2000	0.75	-	-	-	DGM has taken up this area for exploration with an objective to search for gold deposit in Hardi area. Detailed investigation of eastern block showed a gold deposit extending over a strike length 1.2 km with average width and depth of 15.5 m and 18 m, respectively. The average grade of the ore is 0.30 ppm. On the basis of encouraging results in Hardi eastern block, the exploration comprised geological mapping of 0.75 sq. km area on 1:2000 scale, excavation of 110 sq. m through 7 trenches, geochemical sampling – 150 nos. Chemical analysis of 12 samples, petrological study of 10 samples and 04 bulk samples were carried out in Hardi western block.
Gold (placer)							
Lalitpur	Berwar area	1:5000 1:2000	2.3 0.66	2	98.21	216	Search for placer gold was carried out in this area by geological mapping . The S.P., magnetic and resistivity survey of about 0.25 sq.km was completed. About 117 cu. m material has been

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Table – 3 (Concl'd)

Agency/ Mineral/ estimated District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources
		Scale	Area (sq km)	No. of boreholes	Meterage		
							excavated in two trenches. Two boreholes were drilled for a cumulative depth of 98.21 m and 216 samples for analysis were collected. An average grade of 0.16 g/t Au was recorded based on chemical analysis.
Barytes Lalitpur	Mathara-Dang area	1:12500	60.00	-	-	160	G4 level exploration was taken up in the area. Digging on 07 nos. pit of dimension 2 m x 2 m x 2.5 m and 02 nos. trench of dimension 13.3 m x 1.0 m x 1.5 m were carried out during the exploratory work. Further exploration will be carried out during 2018-19 in the adjacent area to Mathara-Dang.
Rock phosphate	Semarkhera, Tori, Pisanari, & Sonrai area	1:2000	1.89	-	-	15	G3 level exploration was taken up to assess rock phosphate resources in the eastern most V th block. During regional traversing while tracing extension of rock phosphate in eastern part, sulphide mineralisation was noticed in Jaitupura area. Chemical analysis of samples show good indication of Cu values.
Dimensional stone	Parts of Madawara & Pali of southern part of Latitpur	1:50000	50	-	-	-	Different varieties of dimension stones in 17 new blocks aggregating 300 acre area have been identified and over 20 samples of different sizes were collected for evaluation of quality, cutting, polishing characteristics, market acceptability and other geotechnical properties.

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**Table – 4 : Mineral Production in Uttar Pradesh, 2015-16 to 2017-18
(Excluding Atomic Minerals)**

(Value in ` '000)

Mineral	Unit	2015-16			2016-17			2017-18 (P)		
		No. of mines	Qty	Value	No. of mines	Qty	Value	No. of mines	Qty	Value ^s
All Minerals		2		56568882	2		56655753	2		56738589
Coal	'000 t	-	12689	-	-	16056	-	-	18309	-
Limestone	'000 t	2	2596	428321	2	2656	515192	2	2399	598028
Sulphur*	t	-	47836	-	-	46618	-	-	47691	-
Minor Minerals [@]		-	-	56140561	-	-	56140561	-	-	56140561

*Note: The number of mines excludes Fuel Minerals and Minor Minerals**\$Excluding Fuel minerals.*** Recovered as by-product from oil refinery.**@ Figures for earlier years have been repeated as estimates, wherever necessary, because of non-receipt of data.***Table-5 : Principal Mineral-based Industries in Uttar Pradesh**

Industry/plant	Capacity ('000 tpy)
Abrasive	
John Oakey and Mohan Ltd, Ghaziabad.	NA
Aluminium	
Hindalco Industries Ltd, Renukoot.	700 (alumina) 345 (aluminium)
Asbestos Product	
Asbestos Cement Ltd, Raebareli.	NA
Uttar Pradesh Asbestos Product Ltd, Mohanlalganj, Lucknow.	NA
Cement	
ACC Ltd, Tikaria, Distt Sultanpur (G).	3000
Ambuja Cement, Dadri, Gautam Budh Nagar (G).	1800
Raebareli Cement Works, Birla Corporation (G).	1300
Heidelberg Cement (Diamond Cement), Madora Jhansi (G).	2100
Jaypee Cement, Sadvakhurd (Blending Unit).	600
UltraTech Cement, Sikandrabad (G).	1000
UltraTech Cement, Dalla Cement Factory, Dalla Distt Sonbhadra.	500
Jaypee Cement, Chunar Cement Factory, Chunar, Distt Mirzapur (G).	2500

Table - 5 (Contd)

Industry/plant	Capacity ('000 tpy)
Jaypee Cement, Tanda, Ayodhya, Distt Faizabad (G).	1000
Jaypee Cement, Churk Mirzapur (G)	1500
Reliance Cement, Kundanganj, Distt Raebareli.	2000
UltraTech Cement, Dadri (G).	1300
UltraTech Cement, Aligarh (G).	1300
Mangalam Cement, Aligarh (G)	750
Fertilizer	
Asian Fertilizers Ltd, Deokahia, Gorakhpur	66 (SSP)
Coromandel International Ltd (Formerly Liberty Phosphate Ltd), Raebareli.	132 (SSP)
Jubilant Agri and Consumer Products Ltd (Formerly Vam Organic Chemicals Ltd), Bhartiagram, Gajraula.	165 (SSP)
IFFCO, Phulpur (Unit I & II), Distt Allahabad.	1697.8 (Urea)
IFFCO, Aonla (Unit I & II).	1999.8 (Urea)
Indo Gulf Fertilizer Ltd (a unit of Aditya Birla Nuva Ltd), Jagdishpur.	1105.5 (Urea)
Kanpur Fertilizer & Cement, (formerly Duncan India Ltd), Kanpur.	722 (Urea)

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Industry/plant	Capacity ('000 tpy)	Industry/plant	Capacity ('000 tpy)
Khaitan Chemicals & Fertilizers Ltd, Goramachhia, Jhansi.	132 (SSP) 52.8 (H ₂ SO ₄)	Ferro Alloys Hindustan Ferro Alloys, Hamirpur.	3.2
Khaitan Chemicals & Fertilizers Ltd, Malwan, Fatehpur.	115 (SSP) 52.8 (H ₂ SO ₄)	The India Thermit Corpn. Ltd, Kanpur.	0.3
KRIBHCO Shyam Fertilizer, Piprola Shahajahanpur.	864.6 (Urea)	Iron & Steel Malvika Steel Ltd, Jagdishpur.	511 (pig iron) 600 (saleable steel)
Madan Madhav Fertilizers & Chems Pvt. Ltd, Fetehtarh.	24 (SSP)	Petroleum Refinery IOCL, Mathura.	8000
Natraj Organics Ltd, Muzaffarnagar.	60 (SSP)	<i>(G); Grinding Unit</i>	
Tata Chemicals Ltd, Babrala, Distt Badaun.	1155 (Urea)	<i>Note: Data, not readily available for fertilizer and cement Industries on respective websites, is taken from Indian Fertilizer Scenario, 2015/FAI Statistics, 2015-16 and Survey of Cement Industry & Directory, 2016, respectively.</i>	
V.K. Phosphates Ltd, Bartara , Shahjahanpur	33 (SSP)		

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