Indian Minerals Yearbook 2014

(Part- I)

53rd Edition

STATE REVIEWS
(Uttar Pradesh)

(ADVANCE RELEASE)

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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 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% SiO_2 and a very low Fe_2O_3 is found in Shankargarh, Lohargarh in Allahabad district and also Bargarh in Banda district. It 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 (hematite)** 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

ONGC pursued drilling for exploration of petroleum & natural gas and carried out exploratory drilling of 1,955 meterage in one well in the onland area. GSI and other agencies also carried out exploration in various district of Uttar Pradesh. Details of exploration carried out by GSI and other agencies in the State are furnished in Table-3.

Production

The value of mineral production in Uttar Pradesh at ₹ 5,935 crore in 2013-14 decreased 21% as compared to the previous year. Coal accounted for 34% of the total value of mineral production in the state. Uttar Pradesh was the leading producer of diaspore and second leading producer of pyrophyllite with 55% and 13% contribution in the total output of respective minerals in the country. Among the important minerals, output of coal and diaspore decreased by 9% each, pyrophyllite 17%, sulphur 19% and silica sand 80% during the year under review.

The value of production of minor minerals was estimated at ₹ 3,873 crore for the year 2013-14**.**

The number of reporting mines in Uttar Pradesh was 19 as against 22 in the previous year.

The index of mineral production in Uttar Pradesh for 2013-14 (base 2004-05 = 100) was 87.3 as compared to 95.5 in the previous year.

Table –2 : Reserves/Resources of Coal as on 1.4.2014 : Uttar Pradesh

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
Total/Singrauli	884.04	177.76	-	1061.80

Source: *Coal Directory of India, 2013-14.*

Table – 1 : Reserves/Resources of Minerals as on 1.4.2010 : 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	-	-	-	-	-	-	-	-	-	14450	-	14450	14450
Bauxite	'000 tonnes	-	-	-	-	-	-	-	10390	500	8018	-	18908	18908
Calcite	tonne	-	-	-	-	-	-	-	-	-	11000	-	11000	11000
China clay	'000 tonnes	-	-	-	-	-	-	-	11600	3447	10018	-	25065	25065
Diaspore	tonne	750078	543478	109215	1402771	136057	328230	138907	545	-	224183	-	827921	2230692
Dolomite	'000 tonnes	-	-	-	-	-	12622	-	3500	-	66230	-	82352	82352
Felspar	tonne	-	-	-	-	-	-	-	-	-	200000	-	200000	200000
Fireclay	'000 tonnes	-	-	-	-	-	-	-	-	-	3221	-	3221	3221
Granite (Dim. stone)	'000 cu m	-	-	-	-	-	-	-	-	-	494819	-	494819	494819
Iron ore (Hematite)	'000 tonnes	-	-	-	-	-	-	-	-	-	38000	-	38000	38000
Limestone	'000 tonnes	-	-	-	-	45130	135590	21050	142763	40000	31200	-	415733	415733
Ochre	tonne	-	-	-	-	-	-	-	25000	35000	10000	-	70000	70000
Potash	million tonnes	-	-	-	-	-	-	-	-	-	190	-	190	190
Pyrophyllite	tonne	948617	605071	454154	2007842	522104	1201221	502246	378450	66512	911508	43200	3625241	5633083
Quartz-silica sand	'000 tonnes	8042	14530	3977	26549	1946	15482	3071	957	6290	51590	-	79337	105886
Phosphorite/Rock phosphate	tonne	-	-	-	-	-	432898	3118586	-	740000	21481960	-	25773444	25773444
Sillimanite	tonne	-	-	-	-	-	-	-	2100000	9350000	-	-	11450000	11450000

Figures rounded off.

Table – 3: Details of Exploration Activities in Uttar Pradesh, 2013-14

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Andalusite							
Sonbhadra	Salaidih-Harwariya area	1:25,000 1:12,500	200 91	-	-	309	Reconnaissance stage (G-4) investigation was carried out for andalusite in Mahakoshal Group to delineate and assess the andalusite-bearing zones. LSM had delineated 65.14 km^2 area of andalusite-bearing phyllite/schist out of total 91km^2 area mapped. These andalusite- bearing phyllite and schist of Parsoi Formation of Mahakoshal Group, form a linear ridge in ENE-WSW direction. The andalusite content in phyllite/schist, in general, varies from 15% to 20% by weight. The chemical analysis of samples, viz. residual andalusite crystals collected from surface and streams, give average Al_2O_3 content 42%, while the andalusite crystals separated from bedrock by crushing and sieving yielded average 30% Al_2O_3. Scheelite ($CaWO_4$) mineralisation was noted under UV lamp survey in hornfels. Sulphide disseminations (pyrite +few arsenopyrite) are noted in brecciated rock in Ghiwihi area. Different andalusite-bearing bands were demarcated on map based on andalusite content. The possible tentative reserve of andalusite is 25.90 MT approx. per 1 m depth for an area of 67.99 km^2. The possible andalusite placer reserve calculated is 0.16 million tonnes approx. for average gravel bed thickness of 1.75 m and area covered by residual/float deposit is 0.34 km^2.
Gold							
Sonbhadra	Parsoi area	1:12,500 1:2,000	36 0.34	6	724.95	373	Prospecting stage investigation (G-3) was carried out to assess the auriferous mineralised zones belonging to Mahakoshal Group. A total of 724.95 m drilling has been carried out in six boreholes (PRS-7, PRS-8 & PHA-1 to PHA-4) during 2013-14. Analytical results of core samples of BH-PRS-1 (FS 2012-13) have yielded Au value up to 1.77 ppm. One gold-bearing zone of 1.05g/t x 1.96 m occurring between 147 and 149 m depth has been established in BH-PRS-1. Two samples from BH-PRS-5 have given Au values of 0.170 and 0.15 ppm. Similarly two core samples of PRS-6 have yielded Au values of 0.81 and 0.09 ppm. The analytical results of trench samples in Phaphrakund-Arangi area have given high values of Au like 1 ppm, 1.3 ppm,

(Contd.)

Table – 3 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							1.6 ppm in T-13, 3.2 ppm in T-11, 2.75 ppm in T-4 and 0.45 ppm in T-8. Analytical results of surface and core samples of FS 2013-14 are yet to be received.
Potash							
Sonbhadra	Newari-Barwadih area	1:25,000 1: 1,000	90 0.42	-	-	343	Reconnaissance stage investigation (G-4) was carried out for potash to delineate the potash-bearing zones and assess the resource potentiality of the area. The mapped area comprises rocks of Vindhayan Supergroup consisting of porcellanite and shales of Chopan Formation, olive shale and khaki splintery shale of Kheinjua Formation, cherty stromatolitic limestone of Bargawan Formation, sandstone with glauconite pellets, fine-medium grained glauconitic sandstone and shale of Basuhari Formation, purple and carbonaceous shale of Arangi formation and sandstone of Patherwa Formation. Glauconite, the main source of potash is observed in two forms, viz. in bedded form and pelletal form in sandstone of Basuhari Formation. In Semiyan area, potash-bearing glauconite layer of strike length of 300 m with an average width of 15-20 m was delineated on the surface. Samples from Trench (Tr-1) indicate wt. avg. of K_2O = 4.305% x 10 m. Spot samples analysed for potash from the area range from 4.63% to 6.22%. In Semiyan-Chitikpurwa area, potash-bearing glauconite layer of 40 m strike length with average thickness of 10 m has been delineated. The spot samples indicate K_2O maximum up to 7.02% in transitional facies glauconitic sandstone. In Kurcha and Barwadih area, glauconite layer having a strike length of 30 m has been recorded. Spot samples from Kurcha area show K_2O value ranging from 5.23% to 6.51%. In the south of Manib-ki-Pahari area, one sample from glauconitic sandstone yielded 6.04% K_2O and seven samples yielded 4.52%, 4.34%, 4.11%, 4.34% 4.52%, 4.36% and 4.11% K_2O. Chemical results of 78 spot samples from glauconitic sandstone indicate K_2O ranging from 0.26% to 6.92%.

(Contd.)

Table – 3 (Concld.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Pyrophyllite							
Lalitpur	Karitoran-Tikra area	1:25,000 1:12,500 1: 1,000	200 85 0.50	-	-	226	Reconnaissance stage (G-4) investigation was carried out to delineate and assess the pyrophyllitc-diaspore mineralization. The lithologies exposed in the area are medium grained pink granite, medium grained leucocratic granite, quartz-sericite- pyrophyllite schist, small patches of talc-chlorite schist, pegmatite, quartz reef, amphibolites, dolerite dykes and few patches of ultramafics. Analytical results of ten samples of quartz-sericite- pyrophyllite schist yielded Al_2O_3 ranging from 20% to 22.36% and 51 samples yielded <20% Al_2O_3.
DGM							
Gold							
Lalitpur	Girar-Tori Khutgaon area	-	-	-	-	-	In BHQ of Girar block, the probable reserves of 1,687 kg of average grade 0.35 g/t was assessed.
-do-	Berwar	1:1,000	0.5	-	-	90	Tentative reserves of gold is 87.5 kg with average value of 0.2 g/t.
Sonbhadra	Hardi	1:5,000	1	4	198	120	-

Table – 4 : Mineral Production in Uttar Pradesh, 2011-12 to 2013-14 (Excluding Atomic Minerals)

(Value in ₹ '000)

Mineral	Unit	2011-12			2012-13			2013-14(P)		
		No. of mines	Qty	Value	No. of mines	Qty	Value	No. of mines	Qty	Value
All Minerals		**25**		**74848321**	**22**		**75209010**	**19**		**59351046**
Coal	'000t	4	16178	34369500	4	16090	35844200	4	14721	20046100
Diaspore	t	*	11703	20278	*	8954	14788	*	8115	15662
Limestone	'000t	1	2997	514918	2	3214	603901	2	3144	552684
Pyrophyllite	t	13	33857	8358	14	31613	10555	12	26271	7603
Quartz	t	-	-	-	-	-	-	-	900	90
Silica Sand	t	7	65584	13118	2	42051	8326	1	8336	1667
Sulphur#	t	-	36005	-	-	43574	-	-	35361	-
Minor Minerals@		-	-	39922149	-	-	38727240	-	-	38727240

Note: *The number of mines excludes minor minerals.*
** Associated with pyrophyllite.*
 # Recovered as by-product from oil refinery.
@ Figures for earlier years have been repeated as estimates, wherever necessary, because of non-receipt of data.

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 the organised sector in the State are given in Table - 5.

Table –5 : Principal Mineral-based Industries in Uttar Pradesh

Industry/plant	Capacity ('000 tpy)
Abrasives	
John Oakey and Mohan Ltd, Ghaziabad.	NA
Aluminium	
Hindalco Industries Ltd, Renukoot.	700 (alumina) 345 (aluminium)
Cement	
ACC Ltd, Tikaria, Distt. Sultanpur (G).	2300
Ambuja Cement, Dadri, Gautam Budh Nagar (G).	1200
Birla Cement, Raebareli (G).	630
Heidelberg Cement (Diamond Cement), Jhansi (G).	500
Jaypee Cement, Sadvakhurd (G).	600
Jaypee Cement, Sikandarabad, (G).	1000
Jaypee Cement, Dalla, Distt. Sonbhadra.	500
Jaypee Cement, Chunar, Distt. Sonbhadra (G).	2500
Jaypee Cement, Ayodhya, Distt. Faizabad (G).	1000
Lafarge India Ltd, Dadri (G)	380
Ultra Tech Cement, Dadri (G).	1300
Ultra Tech Cement, Aligarh (G).	1300
Ceramics	
BHEL, Porcelain Insulator Division, Sultanpur.	NA
Kajaria Ceramics Ltd, Sikandrabad, Distt. Bulandshahar.	9.7 (million sq m)
Orients Ceramics & Industry Ltd, Sikandrabad.	95
UP Ceramics & Potteries Ltd, Ghaziabad.	4.8
Chemical	
Kanoriya Chemicals Ltd, Renukoot.	48 (caustic soda)
Fertilizer	
IFFCO, Phulpur (Unit I & II), Distt. Allahabad.	1687.90 (urea)
IFFCO, Aonla (Unit I & II).	1729.2 (urea)
Indo Gulf Fertilizer Ltd, Jagdishpur.	864.6 (urea)
Kanpur Fertilizer & Cement, Kanpur.	722 (urea)
Khaitan Chemical & Fertilizers Ltd, Gora Machia, Distt. Jhansi.	132 (SSP) 52.8 (H_2SO_4)
Khaitan Chemical & Fertilizers Ltd, Malwan, Distt. Fatehpur.	115 (SSP) 52.8 (H_2SO_4)
KRIBHCO Shyam Fertilizer, Piprola Shahajahanpur.	864.6 (urea)
Tata Chemicals Ltd, Babrala, Distt. Badaun.	864.6 (urea)
Ferro Alloys	
Hindustan Ferro Alloys, Hamirpur.	3.2
The India Thermit Corpn. Ltd, Kanpur.	0.3
Iron & Steel	
Malvika Steel Ltd, Jagdishpur.	511 (pig iron) 600 (saleable steel)
Glass	
Hind Lamps Ltd, Shikohabad.	NA
Mohan Crystal Glass Works, Mohan Nagar Distt. Ghaziabad.	40.9
Universal Glass Co., Ghaziabad.	60
Petroleum Refinery	
IOCL, Mathura.	8000

Table - 5 (Concld.)