Indian Minerals Yearbook 2022

(Part- I)

61st Edition

STATE REVIEWS (Uttarakhand)

(ADVANCE RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

Indira Bhavan, Civil Lines,
NAGPUR – 440 001

PHONE/FAX NO. (0712) 2565471
PBX : (0712) 2562649, 2560544, 2560648
E-MAIL : cme@ibm.gov.in
Website: www.ibm.gov.in

July,2024

UTTARAKHAND

Mineral Resources

Important minerals that are found to occur in the State are high-grade **limestone** in Almora, Bageshwar, Dehradun, Nainital, Pauri-Garhwal, Pithoragarh & Tehri-Garhwal districts; **magnesite** & **steatite** in Almora, Bageshwar, Chamoli & Pithoragarh districts; and **tungsten** in Almora district.

Other minerals that occur in the State are: **asbestos** in Chamoli district; **barytes** & **marble** in Dehradun district; **copper** in Almora, Dehradun & Pithoragarh districts; **dolomite** in Dehradun, Nainital & Tehri-Garhwal districts; **graphite** in Almora district; **gypsum** in Dehradun, Pauri-Garhwal & Tehri-Garhwal districts; **lead-zinc** & **silver** in Dehradun & Pithoragarh districts; and **rock phosphate** in Dehradun & Tehri-Garhwal districts (Table - 1).

Exploration and Development

GSI carried out exploration for Tungsten , Base metal, Rare metal, Tin and REE in the State of Uttarakhand during 2021-22. Details of exploration are furnished in Table-2.

Production

Magnesite was the only important mineral produced in Uttarakhand during 2021-22. The value of production of minor minerals' was estimated at ₹ 173 crore for the year 2021-22. There was only one reporting mines in Uttarakhand and that of magnesite only. (Table-3).

Mineral-based Industry

The present status of each Mineral-based Industry is not readily available. However, the important medium and large-scale mineral-based industries in the Organised Sector in the State are furnished in Table - 4.

Table –2 : Details of Exploration Activities in Uttarakhand, 2021-22

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Base Metal							
Pithoragarh	Askot-Thal area	1:12500	50	-	-	281	A total of 50 sq km area were mapped in large scale (1:12500) in parts of Survey of India Toposheet no 62C/01, 05 & 06 in and around Thal and Askot area of Pithoragarh district, Uttarakhand to assess the base metal and gold mineralisation potentiality of the study area. The area comprised the rocks of Paleoproterozoic Age belonging to Lesser Himalayan Crystalline and Mesoproterozoic Age of Garhwal Group of rocks. Lithounits included gneissic rocks of granitic composition and quartzite, amphibolites, phyllite, schist, impure dolomite and limestone of Berinag and Pithoragarh Formation. Geophysical studies (IP, Resistivity, SP survey and Magnetic survey) indicated carbonaceous phyllite and its contact with schist in the central east part of the block showed significant potential for

(contd)

Table –2 (Contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							mineralisation. Systematic bedrock and pitting-trenching sampling were carried out. A total of 150 bed rock samples (BRS), 50 pitting / trenching samples, 20 heavy mineral samples, 13 petrochemical samples, 38 petrographic samples and 10 ore microscopic samples were collected. Analytical results of Cu, Pb, Zn and Au varied from <5 to 597ppm, <20 to 198ppm, <5 to 711ppm & <0.05 to 1ppm respectively. The total 10-line km of surface induced potential (IP), self-potential (SP), resistivity and magnetic geophysical survey were carried out to identify areas of interest that stands out with the surficial mineral lisation evidence and chemical results. Signature of high chargeability and low resistivity with prominent low negative SP anomaly was recorded in western part of the mapped area.
Dehradun	Tons Valley	1:12500	50	-	-	173	A total of 50 sq km area were mapped in large scale (1:12500) in parts of Survey of India toposheet nos. 53F/13 and 14 in and around Tiuni and Chakrata area of Dehradun district, Uttarakhand to assess the potentiality of base metal and gold mineralisation. Geologically, the area comprises rocks of Lesser Himalaya of Mesoproterozoic Age. A total of 100 bedrock samples (including channel sample), 50 stream sediment samples were systematically collected to interpret the nature and extension of mineralisation. In addition, 20 petrographic samples, 3 ore microscopic samples were collected to identify lithologies, ore mineral present in the study area. The analytical value of Pb, Zn, Cu and Au of bedrock samples ranged from 20 ppm to 151 ppm, 5 ppm to 241 ppm, 2.5 ppm to 2,731 ppm and < 5 ppm respectively. Similarly, the analytical value of Pb, Zn, Cu and Au of stream sediment samples

(contd)

Table –2 (Contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							ranged from 20 ppm to 47 ppm, 28ppm to 192 ppm, 6 ppm to 123 ppm and <5 ppm respectively.
Pithoragarh	Nachani road section, Dhari road section	1:12500	-	-	-	-	Reconnaissance survey for polymetallic mineralisation in carbonaceous phyllite/ metamorphosed black shales and associated rocks along Nachani road section, Dhari road section, Askote road section and Pithoragarh road section, Pithoragarh district Uttarakhand (G4) — A total of 115 L km traverse mapping were carried out on 1:12500 scale along four road sections — Nachani, Dhari, Pithoragarh and Askot of Pithoragarah district, Uttarakhand to delineate carbonaceous slate/ phyllite and to look for potential mineral zone in carbonaceous slate/ phyllite and associated rocks. The study area which is part of Lesser Himalaya, comprised lithounits, viz, Central Crystallines of Dharmagarh & Askot of undifferentiated Protereozoic Age, meta-sedimentaries of Rautgara Formation, Pithoragarh Formation and Berinag Formation of Garhwal Group of Proterozoic Age. Carbonaceous slate/phyllite was seen mainly associated with quartzite and phyllite and occurred within Pithoragarh Formation. Four prominent bands were delineated near Maspati, Bhunigaon, Pankholi and Ghatigad. Width of these bands varied from 30cm to 30m. A total of 121 samples for analytical studies, 34 samples for petrographic study, 08 samples for ore microscopy study, 32 samples for fixed carbon and sulphur content analysis, 10 samples for EPMA study and 04 samples for XRD study were collected. Total carbon content of 17 samples analysed varied from 0.54% to 6.38%. A few samples of carbonaceous phyllite did show element concentration (Rb-158ppm, Sr-62.67 ppm, Th-16.97 ppm, U-5.35 ppm and Mo-5.06ppm).

(contd)

Table –2 (Contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
REE & Rare Metals							
Uttarkashi	Gangotri Granite	1:12500	20	-	-	180	Mineral Investigation item (G-4 stage) was carried out to assess REE, Sn, W, Mo and Rare Metals mineralization, in and around Gangotri area, Uttarkashi district, Uttarakhand. The geological mapping of 20 sq. km area on 1:12500 scale and traverse mapping of 65 L. km on 1: 25000 scale was accomplished. A total of 110 bedrock samples, 30 stream sediment/slope wash samples and 40 XRD samples were collected. The Tethyan Sequence and Central Crystalline metasedimentary rocks constituted the Nelong and Gangotri region. In Block II, around Harshil, Dharali, and Jhala area, garnetiferous quartz mica schist, kyanite-sillimanite schist, graphite schist belonging to Central Crystalline were seen intruded by two mica granite, and dikes/sills of layered aplite-pegmatite/pegmatite. The Block-I in Nelong valley comprised low-grade metamorphic rocks of the Tethyan Sequence intruded by two mica granite. The presence of chlorite, epidote, magnetite and sulphides, as well as crustiform multiple injections of quartz veins, suggests hydrothermal activity and alteration. Bedrock samples from Block-I contained value of lead (Pb) from 10 ppm to 23%, Zinc (Zn) concentrations in these samples ranged from 10 ppm to 5,242 ppm. Copper (Cu) value varied from 2.5 ppm to 1,498 ppm and silver (Ag) concentration ranged from 2.5 ppm to 168 ppm.
Tungsten, Tin and REE Mineralisation							
Bageshwar and Pithoragarh	Chaukori area	1:12500	70	-	-	369	A total of 70 L km traverse mapping were carried out on 1:12500 scale to assess potentiality of W, Sn and REE mineralisation around Chaukori area, Bageshwar and Pithoragarh Districts of Uttarakhand in parts of toposheet nos 53O/13 and

(contd)

Table –2 (Concld)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							62C/01. A total of 300 stream sediment samples (SSS), 30 bed rock samples (BRS), 24 petrological samples, 10 XRD samples and 05 EPMA samples were collected. The Study area grouped into two categories viz, Central Crystalline rocks (Dharamgarh Crystalline) of undifferentiated Protereozoic Age consisting of lithounits viz, amphibolite, granite/mylonite gneiss, foliated granite, leuco granite and Garhwal group of Meso Proterozoic Age of Rautaraga Formation consisting of slate, Pithoragarh Formation consisting of limestone/dolomitic limestone, carbonaceous slate/phyllite and Berinag Formation consisting of quartzite, quartz chlorite schist and quartz chlorite mica schist. Out of 300 SSS, 190 REE, W and Sn values ranged from 44.40 ppm to 435.49 ppm, <0.51 ppm to 16.78 ppm and 1.03 ppm to 39.26 ppm respectively. About 11 BRS samples showed REE, W and Sn ranging from 68.92 ppm to 344.54 ppm, 0.62 ppm to 6.78 ppm and 2.83 ppm to 14.96 ppm respectively.

Table-3 : Mineral Production in Uttarakhand, 2019-20 to 2021-22
(Excluding Atomic Minerals)

(Value in ₹ '000)

Mineral	Unit	2019-20			2020-21			2021-22 (p)		
		No. of mines	Qty	Value	No. of mines	Qty	Value	No. of mines	Qty	Value
All Minerals		**3**		**1649607**	**2**		**2205004**	**1**		**1782195**
Magnesite	t	3	44209	81345	2	24437	47945	1	25426	49175
Minor Minerals		-	-	1568262	-	-	2157059	-	-	1733020

Note: *The number of mines excludes Minor minerals.*

Table –1: Reserves/Resources of Minerals as on 1.4.2020: Uttarakhand

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						
Asbestos	tonne	-	-	-	-	-	-	-	-	311	-	-	311	311
Copper														
Ore	'000 tonnes	-	-	-	-	-	-	-	3170	390	660	-	4220	4220
Metal	'000 tonnes	-	-	-	-	-	-	-	53.45	1.44	5.15	-	60.04	60.04
Graphite	tonne	-	-	-		-	-	-	10700	-	-	-	10700	10700
Lead-Zinc														
Ore	'000 tonnes	-	-	-	-	-	-	-	3170	1790	660	-	5620	5620
Lead metal	'000 tonnes	-	-	-	-	-	-	-	138.85	34.25	9.5	-	182.60	182.60
Zinc metal	'000 tonnes	-	-	-	-	-	-	-	151.21	87.99	27.63	-	266.83	266.83
Limestone	'000 tonnes	-	-	-	-	5035	91872	60429	29486	164879	1191059	33011	1575771	1575771
Magnesite	'000 tonnes	8177	-	1782	9959	4056	602	33873	58902	58756	73287	-	229476	239434
Rock Phosphate	tonne	-	-	-	-	3063503	-	1734370	2760000	-	16620513	-	24178386	24178386
Silver														
Ore	tonne	-	-	-	-	-	-	-	1600000	1400000	390000	-	3390000	3390000
Metal	tonne	-	-	-	-	-	-	-	134	4.2	0.39	-	138.59	138.59
Tungsten														
Ore	tonne	-	-	-	-	-	-	-	-	138000	-	520000	658000	658000
Contained WO_3	tonne	-	-	-	-	-	-	-	-	25	-	680	705	705

Figures rounded off.

Table – 4: Principal Mineral-based Industries

Industry/plant	Capacity ('000 tpy)
Abrasives	
Tirupati Microns, Bhagwantpur, Kashipur, Udham Singh Nagar	0.15 (Abrasives Powder)
Cement	
The KCP Ltd, Distt Haridwar (G)	1100
Ambuja Cement, Roorkee, Distt Haridwar (G)	1000
Shree Cement, Roorkee, Distt Haridwar (G)	1800
Shree Cement, Laskar Grinding unit Akbarpur-OUD, Laskar	1800
DBM	
Almora Magnesite Ltd, Village-Matela Distt. Bageshwar	24 (DBM, calcined & semi calcined magnesite)
Minerals & Refractories. Haldwani Pithoragarh	3 (DBM)
Ramesh Chandra Binjola, Kumaon Refractories, Narsingh Talla, Haldwani	8(DBM, calcined magnesite)
Glass	
Hindustan National Glass & Industries Ltd, Rishikesh	4395 TPD

G: Grinding Unit