Indian Minerals Yearbook 2022

(Part- I)

61st Edition

STATE REVIEWS
(Arunachal Pradesh)

(ADVANCE RELEASE)

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ARUNACHAL PRADESH

Mineral Resources

The most important mineral resource of the State is **petroleum & natural gas** and its chief occurrence is reported in Ningru and Dam Duma areas. These hydrocarbon deposits are located in the Assam Arakan Fold Belt (AAFB) and Upper Assam basin in the State. The State also reports resources of **coal** in Namchick Namphuk and Miaobum Coalfields; **Copper** in East Kameng district, **dolomite** in West Kameng district; **fuller's earth** in Tirap district; **graphite** in Lohit, East Siang and Upper Subansiri districts; **limestone** in Dibang Valley, Lohit, East Siang and Upper Subansiri districts and **quartzite** in West Kameng district (Tables-1 and 2).

Exploration & Development

Exploration activities carried out by GSI for lithium,tin, vanidium and tungsten during the year 2021-22 are furnished in Table-3.

Production

Petroleum (crude) and Natural gas (ut.) were the important mineral items produced in Arunachal Pradesh. The value of minor minerals' production was estimated at ₹ 42 crore for the year 2021-22 (Table - 4).

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

Mineral	Unit	Total Reserves (A)	Remaining resources				Total resources (A+B)
			Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	
Copper							
Ore	'000 tonnes	-	-	-	10	10	10
Metal	'000 tonnes	-	-	-	0 .02	0.02	0.02
Graphite	tonne	-	-	3200000	73118257	76318257	76318257
Limestone	'000 tonnes	-	49220	433575	1	482796	482796

Figures rounded off.

Table – 2 : Reserves/Resources of Coal as on 1.4.2022: Arunachal Pradesh

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
Total	**31**	**40**	**19**	**90**
Namchik-Namphuk	31	40	13	84
Miao Bum	–	–	6	6

Source: *Coal Directory of India, 2021-22.*

Table – 3 : Details of Exploration Activities in Arunachal Pradesh, 2021-22

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Lithium, Tin & Tungsten							
West Kameng	Nafra area	1:12500	50	-	-	100	Reconnaissance survey for lithium, tin & tungsten minerals was carried out in Khellong-Khazalang areas, West Kameng district, Arunachal Pradesh. An area of 50 sq. km. area was taken up for reconnaissance survey with large scale mapping on 1:12500 scale. A total of 25 cu. m of trenching were done in areas of estimated strike extension of the pegmatite veins. However the bedrock was not exposed in trenches. Total 25 nos soil samples from the trenches yielded 33-110 ppm Li. 11 nos. of channels were made in the pegmatite, contact zones of gneiss, quartz vein, quartzite, grey phyllite, graphite schist, chlorite quartz mica schist. A total of 67 nos. bedrock samples (including 28 channel samples), 30 nos. stream sediment samples, 20 nos. petrochemical samples, 20 nos. petrological samples, 20 nos. ore mount samples, 10 nos regolith samples, 20 nos heavy mineral samples were collected. The stream sediment samples yielded 10 to 105 ppm Li, 3.5 to 15.9 ppm Sn, 0.9 to 5.1 ppm W. Regolith samples yielded <5 to 63 ppm Li from 10 samples, 3.5 to 11.8 ppm Sn, 1.1 to 2.5 ppm W. 9 nos of PCS samples yielded 48 to 330 ppm Li. Micaceous quartzite in chlorite schist reported the maximum of 330 ppm. 11 nos PCS samples yielded 2.6 to 8.4 ppm Sn and 1 to 3.4 ppm W.Li value analysed from chlorite-quartz mica schist yielded 25 ppm to 302 ppm Li from 6 bedrock samples. Pegmatite veins yielded 14 ppm to 65 ppm Li from 10 samples. One sample of granite yielded 70 ppm Li. Quartz veins yielded <5 ppm to 21 ppm Li from 8 samples. Granite gneiss yielded <5 ppm to 116 ppm Li from 21 samples. Sn values from available 26 nos bedrock samples

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Table – 3 (concld)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							have yielded upto 24 ppm. W values from available 26 nos bedrock samples yielded 0.6 to 52.5 ppm. W values from quartz/quartz-feldspathic veins yielded 0.6 ppm to 52.5 ppm. W values from granite gneiss yielded a maximum of 18 ppm. The chlorite quartz schist has sampled Li values of 280 to 330 ppm from three samples. The relative high values of Li in the schist may be attributed to the granite derived Li-rich fluids from the Bomdila gneiss. Based on the studies carried out and analysis results obtained, the Li, Sn, W values in the study area are not encouraging, except for some relatively higher values of Li from chlorite quartz mica schist upto 330 ppm.
Tin							
East Kameng	Seppa area	1:12500	52	-	-	-	Large Scale mapping of a 52 sq. km. block on 1:12,500 scale was carried out to evaluate the potential of Tantalum and Caesium mineralisation in the assigned area. The area is located in the western part of Arunachal Pradesh exposing rocks of meta-sedimentaries comprising quartz mica schist & schistose quartzite belonging to the Seppa Formation (equivalent with Khetabari Fm.) and garnet biotite gneiss, biotite gneiss belonging to the Lumdung Gneiss (equivalent with Bomdila Gneiss) of the Bomdila Group of Palaeo-proterozoic age, followed by amphibolite and tourmaline bearing pegmatites as the younger intrusive. On the basis of Large-Scale Mapping, by visual estimation and based on physical properties, 3 pegamtite bands have been physically identified namely: Band 1, Band 2 & Band 3. Band 1 which is the major Tourmaline bearing pegmatite band with 60 m thickness and ~1km strike length near Pachi area with partial kaolinisation at

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Table – 3 (concld)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							places. Band 2 a relatively smaller pegmatite band with 20-25 m thickness and 200 m strike length. Band 3 a kaolinised pegmatite band of ~10 m thickness and 100-150 m strike length. Besides, this, there are several surface manifestations like leaching, iron staining etc which were indications of sulphides were also studied and sampled. The highest value of Cs is 23.24 ppm, with values ranging from 3.5 ppm -23.24 ppm in stream sediment, and 17.34 ppm in BRS and 15.678 ppm (channel-CH1A), 15.652 ppm (channel-CH4) and 20.66 ppm (trench T4) all in pegmatite band 1. The highest value of W is 763.397 ppm (remarkably high), with values ranging from 2 ppm 19.22 ppm in stream sediment, and 17.34 ppm in BRS and 11 ppm to 127.75 ppm in channel-CH1A, 3ppm to 10 ppm in channel-CH4 all in pegmatite band 1, and less than 6 ppm in channel 3 & 4. The tantalum values are not so remarkable as the highest value 9.44 ppm in BRS. Two channel samples (CH-5) have high uranium values 58 ppm & 93 ppm. Few stream sediment samples have 20 ppm to 30 ppm U and 18 SSS have thorium values greater than 60 ppm.
Vanadium							
West Siang	Kaying Village	1:12500	50	-	-	90	A total of 50 sq. km. area was mapped in large scale (1:12,500 in and around Kaying area of West Siang district, Arunachal Pradesh to delineate and assess the potentiality of the area for vanadium, graphite, REE and base metal mineralisation. Three bands of carbonaceous phyllite have been delineated for the first time in the area, with about 2 kilometers in strike length and thickness of 15-20 meters. In the northern part of the study area, a band of crystalline limestone has been mapped for the first time with a thickness of roughly 15-20 meters and a strike extension of 3 kilometers. To the northwest of Kaying Village, two bands of tourmaline bearing

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Table – 3 (concld)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							pegmatite have also been mapped with a thickness of 10-15 meters and a strike extension of 500 meters approximately. A total of 60 nos of bed rock samples (including channel samples), 20 nos of trench samples and 10 nos of Petrochemical samples were systematically collected and analysed chemically. Analytical results for carbonaceous phyllite exhibit vanadium values ranging from 101-1303 ppm, chromium values ranging between 88-1688 ppm, copper up to 1262 ppm, rubidium values ranging from 76-830 ppm, lead up to 683 ppm, tin values range from 2-26 ppm, tungsten up to 100 ppm, chromium values up to 1062 ppm and arsenic ranging from 2-1360 ppm. PCS sample of quartzite exhibits LREE value of 221ppm and HREE value of 27.5 ppm, dolomitic limestone exhibits LREE value of 4ppm and HREE value of 0.8 ppm. Bed rock samples of carbonaceous phyllite exhibit LREE values ranging from 104-348 ppm and HREE values range from 3-26 ppm. Also, the chemical analysis of the samples from the study area has not given encouraging values for gold so far with values of up to 50 ppb. Trench samples have yielded chromium values ranging from 342-1590 ppm with an average of 970 ppm. The petrochemical samples of carbonaceous phyllite/graphite have yielded vanadium values up to 3125 ppm, chromium values up to 1688 and copper up to 1368 ppm.
Kra-Daadi	Talangriang-Pakba-Jamin area	1:12500	50	-	-	206	A G-4 stage investigation was carried out involving large scale geological mapping on 1:12,500 scale and a total of 50 sq.km. area was covered under LSM with collection of 108 nos of BRS, 52 nos of PTS, 12 nos of PS, 10 nos of OM and 24 nos of PCS. During the course of LSM, five carbonaceous phyllite bands have been identified and same have been delineated. These are : Band 1:

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Table – 3 (concld)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Carbonaceous phyllite band in the Talangiang area is traced for a strike length of 600m (6km) with the width varies from 80 m to145 m. Band 2: Carbonaceous phyllite band is exposed in the area south of zero point has been traced for a strike length of 3.4 km within block and 1.2 km strike length has been observed outside of the this marked block with the width varies from 10 m to 35 m. Band 3: Carbonaceous phyllite band is exposed in the Pungrung-Pakba area has been delineated for strike length of 9.7 km with the width varies from 10 m to 75 m. Band 4: First time reported a carbonaceous phyllite band in the Layang-Chate area has been delineated for a strike length of 5.6 km with the width varies from 10 m to 35 m. Band 5: Carbonaceous phyllite band is exposed to the north of zero point has been traced for a strike length of 1.5 km having width varies from 10 m to 15 m. Leaching, ferruginisation, yellow and red colour alterations have been noticed in the many spots in the carbonaceous phyllite bands and are indicative of sulphide mineralisation. The results of channel samples from carbonaceous phyllite show the value of Vanadium vary from 289 ppm to 517 ppm and that of Au is less than 50 ppb. The results of pitting and trenching samples from carbonaceous phyllite show that the Vanadium values ranging from 108 ppm to 665 ppm. The fixed carbon content in the carbonaceous phyllite varies from 0.52 % to 8.95%. The analytical results of 24 nos. of PCS reveal that Fe_2O_3 content in the carbonaceous phyllite band varies from 8.81 - 10.90% and one sample from yellow coloured encrustation found in the carbonaceous phyllite in Chate area showing the value upto 17. 27%.

Table-4 : Mineral Production in Arunachal Pradesh, 2019-20 to 2021-22
(Excluding Atomic Minerals)

(Value in ₹'000)

Mineral	Unit	2019-20			2020-21			2021-22 (P)		
		No. of mines	Quantity	Value$	No. of mines	Quantity	Value$	No. of mines	Quantity	Value$
All Minerals		**-**		**455845**	**-**		**397944**	**-**		**416302**
Natural Gas (ut.)	mcm	-	45	-	-	56	-	-	58	-
Petroleum (crude)	'000t	-	56	-	-	54	-	-	48	-
Minor Minerals		-	-	455845	-	-	397944	-	-	416302

$ Excludes the value of Fuel minerals.