

STATE REVIEWS



Indian Minerals Yearbook 2019

(Part- I)

58th Edition

**STATE REVIEWS
(Meghalaya)**

(ADVANCE RELEASE)

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

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MEGHALAYA**Mineral Resources**

Coal and limestone are the only major minerals mined in the State. **Coal** occurs in Mikir Hills, Khasi Hills, Jaintia Hills and Garo Hills districts. Resources of **limestone** occur in West Garo Hills, East Khasi Hills, West Khasi Hills and Jaintia Hills districts. Other mineral occurrences are **apatite** in Jaintia Hills district; **china clay** in East Garo Hills & West Garo Hills, Jaintia Hills & East Khasi Hills districts; **copper, lead-zinc, silver & titanium minerals** in East Khasi Hills district; **felspar & rock phosphate** in East Garo Hills & Jaintia Hills districts; **fireclay** in East Khasi Hills & West Garo Hills districts; **granite** in West Khasi Hills district; **iron ore (magnetite)** in East Garo Hills district; **quartz & silica sand** in East Garo Hills, West Garo Hills & East Khasi Hills districts; and **sillimanite** in West Khasi Hills district (Table -1). The various coalfields and their reserves/resources in the State are furnished in Table-2.

Exploration & Development

Details of exploration activities conducted by GSI and various agencies during 2018-19 are furnished in Table - 3.

Production

Sillimanite and limestone were the important minerals produced in Meghalaya during the year 2018-19.

The value of minor minerals' production was estimated at ₹ 721 lakh for the year 2018-19.

There were 21 reporting mines in 2018-19 in the state for limestone. (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 1.4.2019 : Meghalaya

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
Total	89.04	16.51	470.93	576.48
West Darangiri	65.40	–	59.60	125.00
East Darangiri	–	–	34.19	34.19
Balphakram-Pendenguru	–	–	107.03	107.03
Siju	–	–	125.00	125.00
Langrin	10.46	16.51	106.19	133.16
Mawlong Shelia	2.17	–	3.83	6.00
Khasi Hills	–	–	10.10	10.10
Bapung	11.01	–	22.65	33.66
Jayanti Hills	–	–	2.34	2.34

Source: Coal Directory of India, 2018-19.

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Table – 1 : Reserves/Resources of Minerals as on 01-04-2015: Meghalaya

Mineral	Unit	Reserves				Remaining Resources				Total resources (A+B)				
		Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331		Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)
			STD121	STD122			STD221	STD222						
Apatite	tonne	-	-	-	-	-	-	-	-	1300000	-	1300000	1300000	
China clay [#]	'000 tonnes	-	-	-	-	-	-	1200	6266	76242	5167	88875	88875	
Copper														
Ore	'000 tonnes	-	-	-	-	-	-	-	880	-	-	-	880	
Metal	'000 tonnes	-	-	-	-	-	-	-	9	-	-	-	9	
Felspar [#]	tonne	-	-	-	-	-	-	-	-	37449	-	-	37449	
Fireclay [#]	'000 tonnes	-	-	-	-	-	-	-	-	10999	-	-	10999	
Granite ^{##}														
(Dimension Stone)	'000 cum	-	-	-	-	-	-	-	-	-	286467	-	286467	
Iron ore (Haematite)	'000 tonnes	-	-	-	-	-	-	-	-	225	-	-	225	
Iron ore (Magnetite)	'000 tonnes	-	-	-	-	-	-	-	-	3380	-	-	3380	
Lead-Zinc														
Ore	'000 tonnes	-	-	-	-	-	-	-	880	-	-	-	880	
Lead metal	'000 tonnes	-	-	-	-	-	-	-	16.5	-	-	-	16.5	
Zinc metal	'000 tonnes	-	-	-	-	-	-	-	14	-	-	-	14	
Limestone	'000 tonnes	135836	87904	1822 225562	68457	39289	46200	464670	2811179	14048758	-	17478553	17704116	
Quartz-														
Silica sand [#]	'000 tonnes	-	-	-	-	-	-	-	177	6906	-	-	7083	
Rock														
Phosphate	tonne	-	-	-	-	-	-	-	-	1311035	-	-	1311035	
Sillimanite	tonne	-	-	-	-	-	-	-	-	55807	-	-	55807	
Silver														
Ore	tonne	-	-	-	-	-	-	-	880000	-	-	-	880000	
Metal	tonne	-	-	-	-	-	-	-	19.8	-	-	-	19.8	

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 Meghalaya, 2018-19

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Bauxite							
West Khasi Hills	Umsung area	1:4000	1.5	-	-	-	Reconnaissance survey for lateritic bauxite and associated minerals was continued from field session 2017-18 in the eastern part of Umsung area, West Khasi Hills district. An area of 1.5 sqkm was mapped on 1:4,000 scale. Chemical analysis of bedrock samples showed that the bauxite ore was composed of Al ₂ O ₃ (30.99% to 67.15% with average of 50.61%), Fe ₂ O ₃ (T) (3.65% to 37.81%, average 16.71%), SiO ₂ (0.1% to 45.51%, average 10.18%) and TiO ₂ (0.76% to 8.07, average 3.30%). Gallium (Ga) values recorded were in the range of 36 ppm to 113 ppm with an average of 79.38 ppm and vanadium (V) values were in the range from 89 ppm to 1,432 ppm with an average of 429.52 ppm in the bauxites. The exploration work will continue in next field season 2019-20.
Bauxite & REE							
West Khasi Hills	Umsung area	1:12500	50.0	-	-	-	Reconnaissance survey for lateritic bauxite and associated REE mineralisation was taken up in and around Kshekholong area, east of Nongstoin, West Khasi Hills district. An area of 50 sqkm in and around Nongspung, Kshekholong, Maukhaton, Salang, Lumrsiyang-Pamphyrnai and South of Markasa area was mapped on 1:12,500 scale. One small bauxite patch of dimension 50 m X 50 m and thickness around 50 cm was mapped in Pamphyrnai village. A pit of dimensions of 2 m x 1 m x 1 m was dug on the northern side of the hillock and another pit of dimension 2 m x 1 m x 1.5 m at RL 1640 m was dug on the southern side of the hillock in suspected cappings to check the mineralisation. Samples from different soil horizons for REE were collected. Chemical analysis results are awaited. The exploration work will continue in next field season 2019-20.

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
REE							
Kamrup (Assam) Ri-Bhoi (Meghalaya)		1:12500	75.0	-	-	75	In Meghalaya & Assam, a reconnaissance survey for REE in biotite gneiss and granitic rocks of Garbhanga-Jorabat area, Kamrup (Metro) district, Assam and Ri-Bhoi district, Meghalaya covering an area of 75 sqkm was mapped on 1:12,500 scale. Pitting and trenching of 75 cu.m in grid pattern was done in two blocks of 1.5 sqkm each and 75 pit/trench samples were collected. The chemical analysis results of pitting/trenching samples indicated total REE concentration from 268.901 to 505.72 ppm (Avg. 381.94). BRS samples showed total REE content from 26.55 to 760.89 ppm (average 366.12 ppm).
Tin							
West Khashi Hills	Lyngkhoi- Sohiong block						Reconnaissance survey for tin mineralisation was taken up in Lyngkhoi-Sohiong block, West Khashi hills district. An area of 50 sqkm was mapped on 1:12,500 scale to identify the lithological variations and the intrusive acidic veins. In the absence of any prominent pegmatite veins, only the quartz veins were sampled to find out possible tin mineralisation. Chip and channel samples were collected from bedrock (BRS) and pit/trench samples (PTS) from vein quartz to know the possible tin mineralisation in the area. Stream sediment samples were also collected to study the heavy mineral assemblage in the terrigenous material. In stream sediment samples, Sn concentration showed variations from 4 to 20 ppm, and the maximum of 91 ppm was reported in only one sample. Sn concentration in vein quartz (BRS/PTS) was found to vary from less than 1 to 23 ppm which does not seem encouraging in context of tin mineralisation. The study will continue in field season 2019-20. A reconnaissance survey for titaniferous-vanadiferous-magnetite around Uming area,

(contd)

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Vanadium							
West Jaintia Hills	Uming area Sohiong block						West Jaintia Hills district was taken up. A total area of 50 sqkm were mapped on 1:12,500 scale to evaluate the potential of titaniferous-vanadiferous magnetite bodies in the area. Chemical analysis of samples collected from various litho-units showed values of TiO ₂ ranging from 16.4 to 17.58% and vanadium from 92 to 9201 ppm. A total of 0.4 L km of magnetic survey could only be completed owing to undulating terrain and inaccessibility. About 39.0 cu.m of shallow pitting & trenching was done in order to check the continuity of the magnetite body.
Diamond							
East Garo Hills Ri-Bhoi	Wageasi and Nongpoh Lailad area						Reconnaissance survey for Kimberlite Clan of Rocks (KCR) was carried out in and around Wageasi and Nongpoh Lailad area, East Garo Hills and Ri-Bhoi district. The area was mapped on 1:50,000 scale. From the petrological and mineral compositions, the lamprophyres were categorized as monchiquites (alkaline lamprophyre). Alkaline lamprophyres (monchiquites) were reported for the first time from the Wageasi-Chibak area. Sporadic dissemination of sulphides, such as, pyrite, chalcopyrite and malachite were observed along Lailad-Umling road within the quartzo-feldspathic veins found intruded within gneiss. Bedrock and petrochemical samples were collected along with stream sediment samples and petrological samples. The analytical results for base metals were not encouraging. The KCR has not been reported during the present investigation.
Phosphorite							
East Jaintia Hills	Pala – Larket Village, Litanh Valley	1:12500	50.0	6	293.2	164	G4 stage reconnaissance survey for phosphate in shales of Kopili Formation in and around Village Pala-Larket included Large-Scale (contd)

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Mapping, pitting and trenching, drilling, collection of 154 core samples and 10 samples for XRD studies. Three alternative marl and shale horizons were studied in various sections. Phosphate nodules were found scattered in the lower most shale horizon above the contact of Shella Formation. Phosphatic nodules of few centimeters to 10 cm in size were noted in the transition zone of Shella and Kopili Formation which is about 1.5 to 2 m thick zone. The average concentration of nodules per unit volume is 0.002 cu.m. In nodules, P ₂ O ₅ content was found to vary from 5.23 to 16.70%. Shale and marl were found having an average concentration of below 1%. The study will continue in field season 2019-20.
Limestone							
East Jaintia Hills	Akshe block Litang valley	1:4000	2.8	6	810.0	-	G3 stage preliminary exploration for limestone was carried out to assess the resource of different grades of limestone. The Upper Sylhet limestone which was the target horizon for exploration the average thickness was of 108.12 m. The limestone was mostly of cement-grade with minor amounts of SMS (OH) grade. During detailed mapping, two litho-units, namely, grey fossiliferous limestone of the Upper Sylhet Limestone and shale-sandstone-marl were observed in the block. It was for more observed that in all the core logs the limestone was fossiliferous, massive, indurated and ferruginous towards the upper part, while at the bottom part, it was grey to buff coloured.
East Jaintia Hills	North Pala block Litang valley	1:4000	3	12	1164.95	473	With an objective to make systematic assessment of grade-wise reserves/resources for Prang limestone of Shella Formation, a G-3 stage preliminary exploration in North Pala block was started from field season 2016-17 onward. In north Pala block, detailed

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Table – 3 (concl'd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							mapping of 3 sq. km was carried out on 1:4,000 scale in field season 2016-17 and FS 2017-18. The work carried out in field season 2018-19 included exploratory drilling of 1,164.95 m in 12 boreholes drilled on grid pattern and 439 core samples and 34 check samples were collected to evaluate the grade of limestone and to estimate the grade-wise resources for the block. Spacing of boreholes grid was approximately at 500 m along the strike and 450 m along the dip. The exploratory drilling carried out in North Pala block revealed the presence of a very thick (average thickness 81.33 m), grey coloured, medium grained, highly fossiliferous limestone band. The XRF analytical result for 271 primary core samples of six boreholes indicated that the limestone comprised CaO ranging from 28.33% to 51.43% (Avg. 42.59%), MgO from 1.17% to 3.49% (Avg. 1.98%), Al ₂ O ₃ from 1.21% to 10.52% (Avg. 4.39%), Fe ₂ O ₃ from 0.86% to 17.04% (Avg. 4.01%) and SiO ₂ from 2.57% to 18.70% (Avg. 8.09%). Though, the limestone contained higher value of CaO but due to higher silica percentage, it mainly conformed to cement-grade with subordinate SMS grade limestone.
East Jaintia Hills	SE of Akshe Litang valley	1:4000	3.0	6	799.95	350	G3 stage preliminary exploration for limestone was carried out in South east of Akshe, Litang Valley. The major rocks exposed in the area were sandstone, shale, marl and Upper Sylhet Limestone. The upper sylhet limestone was mainly exposed in the northern, south-eastern and south-western part of the area and was light grey to dark grey coloured, hard, massive and highly fossiliferous. The thickness of upper sylhet limestone intersected in the boreholes showed variations from 38.37 to 120.58 m. Out of 350 core samples sent for analysis, results of 136 samples were received.

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**Table - 4 : Mineral Production in Meghalaya, 2016-17 to 2018-19
(Excluding Atomic Minerals)**

(Value in ₹ '000)

Mineral	Unit	2016-17			2017-18			2018-19 (P)		
		No. of mines	Qty	Value ^s	No. of mines	Qty	Value ^s	No. of mines	Qty	Value ^s
All Minerals		14		2612627	19		2935103	21		2866591
Coal	'000t	-	2308	-	-	1529	-	-	-	-
Sillimanite	t	1	-	-	1	459	3374	1	24	168
Limestone	'000t	13	5095	2540552	18	6599	2859654	20	7195	2794348
Minor Minerals @		-	-	72075	-	-	72075	-	-	72075

*Note: The number of mines excludes fuel and minor minerals.**\$ Excludes the value of Fuel minerals.**@ Figures for earlier years have been repeated as estimates because of non-receipt of data.***Table – 5 : Principal Mineral-based Industries**

Industry/plant	Capacity ('000 tpy)
Cement	
Adhunik Cement (Subsidiary of Dalmia Cement), Distt Jaintia Hills	1500
Amrit Cement Industries Ltd, Khleriat, Distt Jaintia Hills	3000
Cement Manufacture Co. Ltd, Lumshnong, Distt Jaintia Hills	792
DCBL Meghalaya Cements Ltd, Thangskai, Narpuh Distt Jaintia Hills	1500
Green Valley Industries, Nongsning, Jowai, Distt Jaintia Hills.	1000
JUD Cement Ltd, Norpuh, Distt Jaintia Hills	500
Mawmluh Cherra Cements Ltd, Cherrapunjee, Distt East Khasi Hills	185
Meghalaya Cements Ltd, Thangskai, Distt Jaintia Hills	860
Megha Technical & Engineering (P) (Subsidiary of CMCL), Lumshnong, Distt Jaintia Hills	1000
Hills Cement, Jaintia Hills	1000
RNB Cement, East Khasi	400
Ferroalloys	
Jaintia Ferro Alloys Pvt. Ltd, Byrnihat.	6
Maithan Alloys Ltd, Ribhoi	15 MVA
Maithan Alloys Ltd, RajaBagan	28
Nalari Ferro alloys Pvt Ltd, Norbhog	11
Khasi alloys Pvt. Ltd, EPIP Meghalaya	4.1
Iron & Steel	
Jai Kamakhya Alloy Pvt. Ltd	815 tpd

Source: Data from respective websites of cement industries as well as Survey of Cement Industry & Directory.