

STATE REVIEWS



# Indian Minerals Yearbook 2012

(Part- I)

**51<sup>st</sup> Edition**

**STATE REVIEWS  
(West Bengal)**

**(FINAL RELEASE)**

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## WEST BENGAL

### Mineral Resources

West Bengal is the principal holder of country's appetite resources and is said to possess 16% china clay resources. Important minerals that occur in the State are **apatite** in Purulia district; **coal** in Bardhaman, Bankura, Birbhum, Darjeeling, Jalpaiguri and Purulia districts; **china clay** in 24-Parganas, Bankura, Birbhum, Bardhaman, Hoogly, Midnapur and Purulia districts; and **fireclay** in Bankura, Birbhum, Bardhaman and Purulia districts.

Other minerals that occur in the State are **barytes, copper, gold, kyanite, pyrite** and **titanium minerals** in Purulia district; **dolomite** in Jalpaiguri district; **felspar** in Bankura and

Purulia districts; **granite** in Bankura, Birbhum and Purulia districts; **lead-zinc** in Darjeeling district; **limestone** in Bankura and Purulia districts; **manganese ore** and **sillimanite** in Midnapur district; **quartz/silica sand** in Bankura, Hoogly and Purulia districts; and **tungsten & vermiculite** in Bankura district (Table - 1). Reserves/resources of coal along with details of coalfields are provided in Table-2.

### Exploration & Development

ONGC carried out seismic survey and drilling for exploration of petroleum & natural gas and data for 382.50 (2D-GLK/LK) & 1014.83 (3D- sq km) was required in 2011-12. The details of exploration activities conducted by various agencies for coal and other minerals during 2011-12 are furnished in Table - 3.

**Table – 2 : Reserves/Resources of Coal as on 1.4.2012 : West Bengal**

(In million tonnes)				
Coalfield	Proved	Indicated	Inferred	Total
<b>Total</b>	<b>12425.44</b>	<b>13358.24</b>	<b>4832.04</b>	<b>30615.72</b>
Raniganj	12311.17	7713.95	4130.29	24155.41
Barjora	114.27	-	-	114.27
Birbhum	-	5644.29	686.75	6331.04
Darjeeling	-	-	15.00	15.00

*Source: Coal Directory of India, 2011-12.*

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Table – 1 : Reserves/Resources of Minerals as on 1.4.2010 : West Bengal

Mineral	Unit	Reserves				Remaining resources						Total resources (A+B)	
		Proved STD111	Probable		Total (A)	Measured STD331	Pre-feasibility		Indicated STD332	Inferred STD333	Reconnaissance STD334		Total (B)
			STD121	STD122			STD221	STD222					
Apatite	tonne	2052517	-	-	2052517	120000	8845250	852605	666646	11709846	13762363		
Barytes	tonne	-	-	-	-	433000	-	-	-	433000	433000		
China clay	'000 tonnes	1232	185	906	2323	38	332236	80335	5826	419340	421663		
Copper													
Ore	'000 tonnes	-	-	-	-	-	113	-	-	113	113		
Metal	'000 tonnes	-	-	-	-	-	2.09	-	-	2.09	2.09		
Dolomite	'000 tonnes	-	12528	48000	60528	-	73226	104275	-	177501	238029		
Felspar	tonne	25874	-	-	25874	900000	3400000	201250	-	4501250	4527124		
Fireclay	'000 tonnes	771	104	854	1729	-	419	11115	958	13852	15581		
Gold													
Ore (primary)	tonne	-	-	-	-	-	-	-	1283333	1283333	1283333		
Metal (primary)	tonne	-	-	-	-	-	-	-	0.65	0.65	0.65		
Granite (Dim. stone)	'000 cu m	3658	-	-	3658	19827	1140	8802	-	29768	33426		
Kyanite	tonne	-	-	-	-	-	-	26520	-	26520	26520		
Lead-zinc													
Ore	'000 tonnes	-	-	-	-	-	3371	335	-	3706	3706		
Lead metal	'000 tonnes	-	-	-	-	-	130.07	10	-	140.07	140.07		
Zinc metal	'000 tonnes	-	-	-	-	-	130.42	13	-	143.42	143.42		
Limestone	'000 tonnes	-	-	-	-	7104	15482	22120	-	44706	44706		
Manganese ore	'000 tonnes	-	-	-	-	-	-	200	-	200	200		
Pyrite	'000 tonnes	-	-	-	-	-	-	2500	-	2500	2500		
Quartz-silica sand	'000 tonnes	779	-	1022	1801	-	11	4607	-	6430	6430		
Sillimanite	tonne	-	-	-	-	-	-	1653000	-	1653000	1653000		
Titanium minerals*	tonne	-	-	-	-	-	-	2279000	-	2279000	2279000		
Tungsten Ore	tonne	-	-	-	-	-	190739	400000	-	763802	763802		
Contained WO <sub>3</sub>	tonne	-	-	-	-	-	450	1000	-	1530.84	1530.84		
Vermiculite	tonne	-	-	-	-	-	490	5076	-	5566	5566		

Figures rounded off.

\* Resources of ilmenite, rutile and zircon as per Department of Atomic Energy for the minerals are provided in the respective Mineral Reviews.

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**Table – 3 : Details of Exploration Activities in West Bengal, 2011-12**

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
<b>GSI</b>							
<b>Apatite</b> Purulia	Panrkidih	-	-	7	-	-	Prospecting stage investigation (G-3) was carried out during FS 2010-12 for resource evaluation of apatite and associated minerals. Seven boreholes were drilled to test the depth persistence of apatite-magnetite veins up to 30 m vertical depth. It revealed that apatite magnetite veins, about 150 m strike length and average 1 m width on the surface, do not persist up to that depth. Analytical result of bedrock samples and channel samples show average 24% P <sub>2</sub> O <sub>5</sub> and 23% P <sub>2</sub> O <sub>5</sub> respectively. However, gamma ray logging carried out by AMD indicates presence of radioactive zone (more than 0.03% e U <sub>3</sub> O <sub>8</sub> ) between 48.00 m and 49.50 m depths in BH-5 & (0.010 — 0.015% e U <sub>3</sub> O <sub>8</sub> ) between 46.90 m and 47.60 m depth in PBH-6. Integrated geophysical survey by applying Self Potential (SP), magnetic (VF) and time domain. Induced Polarization (IP) methods were carried out in Lanka and Parbahal blocks of the adjoining state Jharkhand. In Lanka block, geophysical survey has brought out nine resistivity anomaly zones (strike length from 100 m to 900 m) and two magnetic anomalies zones (300 m & 650 m) trending in E-W directions. In Parbahal block, five chargeability (strike length from 150 m to 800 m), two resistivity (strike length from 500 m & 100 m) and one magnetic contact zones (strike length of 800 m) trending in E-W directions were brought out. The work has been completed.

(Contd.)

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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	Metreage		
<b>GSI</b> <b>Coal</b> Birbhum	Bhabaniganj	-	-	3	-	-	Reconnaissance stage (G-4) regional exploration for coal continued during the the reporting period to examine the extension of Barakar coal seams to the east of Nabasan and Binodpur-Bhabaniganj blocks and to appraise the development pattern and regional persistence of the coal seams in the Barakar Formation. The area lies in the eastern adjacent part of Binodpur-Bhabaniganj Block and south of Kasta area in the Trans-Ajay part of Raniganj Coalfield. During the period under review, three boreholes were drilled in the area. In borehole BH- 5, a 5.50 m thick coal seam (Salanpur-A seam) has been intersected at 391.30 m depth. Continuity of Barakar coal seams from the above-mentioned adjacent explored blocks was established. The investigation was completed on 23.11.2011.
<b>GSI</b> <b>Coal</b> Birbhum	South of Hingla river	-	-	08	-	-	Reconnaissance stage (G-4) regional exploration by scout drilling was initiated during FS 2010-12 to establish the development pattern and structural disposition of Barakar coal seams at depth under the cover of Barren Measures along with appraisal of the coal resource potentiality and to establish strike-wise continuity of the regional Barakar coal seams already established in Nabasan and Binodpur-Bhabaniganj Blocks located towards west in order to generate CBM baseline data. In the period eight boreholes viz., BH-2 to 9 were drilled in the area. Development of Barakar coal seams, corelatable with Salanpur A group with cumulative thickness varying from 0.70 m to 6.30 m were intersected in the depth range from 240.90 m to 480.40 m. The work is in progress.

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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	Metreage		
<b>GSI</b>							
Coal (Birbhum Coalfield) Birbhum	Dhobbanpur	-	-	4	-	-	Prospecting stage (G-3), regional exploration for Gondwana coal under the cover of Rajmahal Trap and Tertiary sedimentaries, initiated during FS 2009-10 with an objective to (a) establish continuity of coal bearing Barakar Formation to the south and east of Makhdumnagar and south of allotted CBM Blocks (BB-CBM-2005/III of DGM), (b) to examine the development pattern of coal seam and (c) generation of baseline data related to CBM, was continued in FS 2010-12. During the period drilling has been completed in four boreholes, viz, BDB-3 (part), BDB- 4, BDB-5 (part) and BDB-6 (part). A maximum of 23 coal sections of Barakar Formation have been intersected between 429.55 m and 659.05 m depth. Thickness of the coal section ranges from 0.50 m to 4.75m. Besides, two lignite seams of 1.20 m and 1.50 m thickness within Tertiary sediments have also been intersected at 169.10 and 173.20 m depth in borehole No BH-4. Maximum cumulative thickness of coal is 29.85m recorded in borehole BH-4 in the central part of the area. CBM desorption study of core samples collected from the coal seams has indicated a mere presence of desorbed gas (Q3) value of 0.10-0.15cc/gm. The investigation is under progress.

(Contd.)

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Table - 3 (Concl.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
<b>GSI</b> Coal Birbhum	Gazipur, South of Mahalla	-	-	03	-	-	Exploration by scout drilling (G-4 stage) initiated during FS 2009-10 and was continued during FS 2010-12 to examine the extent of coal bearing Barakar and other Gondwana formations below the area of Tertiary sedimentaries and Rajmahal Trap, to apprise the coal development and CBM potentiality. Drilling has been completed in three boreholes viz, BH-3 (part), BH-4 and BH-5 (part). The borehole BH-4 located in the southwestern part of the area has intersected 13 Barakar coal seams ranging in thickness from 0.60 m to 4.40 m in the depth range from 659.65 m to 797.20 m and having cumulative thickness of 22.81 m of coal. In borehole BH-3, six Barakar coal seams have been intersected ranging in thickness from 0.50 m to 1.75 m between 554.10 m and 656.30 m depths. CBM desorption study of core samples collected from the coal seams indicate a desorbed gas (Q3) value of 0.104 cc/gm to 0.256 cc/gm. The last borehole BH-5 has recorded 159.30 m of Tertiaries and 201.60 m of Rajmahal Trap. The investigation is under progress.
<b>Talc/Steatite/ Soapstone</b> Darjeeling	Lepcha Basti & Singla area	-	-	-	-	-	Reconnaissance stage investigation was carried out during FS 2010-12, in collaboration with DMM, West Bengal. A talc lens sandwiched between overlying Daling quartzite and underlying Daling phyllite has been located on a hill slope in north-eastern part of the area at Darjeeling Gorkha Hill Council Forest beside Village Singla. Three trenches have been dug to trace the strike extension of the talc lens. Trench 1 exposed 3.2 m wide, both lumpy and platy talc. Trench-2 (which lies 40 m west of T-1), exposed 2.5 m wide talc of above types with impurities like Fe, mud and clay. The continuity of the talc lens has been traced down slope over a distance of about 120 m toward SE of Trench-I, where 1.5 m of talc body of both platy and lumpy types has been exposed. The analyses of 19 nos bed rock samples of pure/impure talc bodies show 18.91-34.94% MgO with average of 31.63% MgO. The work has been completed.

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**Production**

The value of mineral production in West Bengal at ₹8,273 crore increased to more than twice in 2011-12 as compared to the previous year. The State accounted for 3% of the value of mineral production in India. West Bengal is the only other producer of apatite and accounted for 5% of the total production in the country. Coal alone accounted for 98% of the value of mineral production in the State during the year under review. The production of natural gas (utilised)

increased to double and that of felspar increased by 86%, fireclay by 60%, sulphur by 26% and coal by 12% whereas production of kaolin, quartz and silica sand decreased by 3%, 5% and 7% respectively as compared to the previous year (Table- 4).

The production value of minor minerals was estimated at ₹146 crore for the year 2011-12.

The number of reporting mines in West Bengal in 2011-12 was 117 as against 109 in the previous year.

**Table – 4 : Mineral Production in West Bengal, 2009-10 to 2011-12  
(Excluding Atomic Minerals)**

(Value in ₹ '000)

Mineral	Unit	2009-10			2010-11			2011-12 (p)		
		No. of mines	Qty	Value	No. of mines	Qty	Value	No. of mines	Qty	Value
<b>All Minerals</b>		<b>112</b>		<b>47461066</b>	<b>109</b>		<b>29954033</b>	<b>117</b>		<b>82726719</b>
Coal	'000t	100	23133	45807600	98*	21659	28164100	100*	24230	80662100
Natural Gas (utilised.)	m c m	-	38	142213	-	41	262441	-	84	537684
Apatite	t	1	2110	3699	1	1261	2211	1	136	238
Clay (others)	t	-	-	-	-	-	-	-	-	-
Felspar	t	-	3050	1464	-	2702	1321	-	5031	1945
Fireclay	t	5	46179	4614	3	36868	4716	6	59069	5377
Kaolin	t	3	99439	42979	3	89845	37937	5	86837	37759
Quartz	t	3	15823	3384	3	16906	4194	4	16062	4842
Silica Sand	t	-	-	-	1	55000	22000	1	51130	21661
Sulphur #	t	-	15511	-	-	25292	-	-	31749	-
Minor Minerals@		-	-	1455113	-	-	1455113	-	-	1455113

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

*\* Relates to coal mines as on 31.03.2011.*

*# Recovered as by-product from oil refinery.*

*@ Figures for earlier years have been repeated as estimates, because of non-receipt of data.*



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**Mineral-based Industry**

Important large and medium-scale mineral-based industries located in the State with their total installed capacities are given in Table - 5.

**Table – 5 : Principal Mineral-based Industries in West Bengal**

Industry/plant	Capacity ('000 tpy)
<b>Asbestos Products</b>	
Everest Building Products Ltd, Kolkata.	NA
Ramco Industries Ltd, Haratara, Dist. Paschim Midnapur.	NA
UAL Industries Ltd, Tungadhowa, Dist. Paschim Midnapur.	150
<b>Abrasives</b>	
Carborandum Universal Ltd, Gopalpur.	NA
K.L.Thirani & Co. Ltd, Kolkata	NA
<b>Cement</b>	
Ambuja Eastern, Sankrail (G).	1000
Birla Corporation Ltd, Durgapur (G).	600
Damodar Cement, Purulia (G).	525
Ultra-Tech Cement Works, Durgapur (G).	1000
Durga Hitech Cement (G).	1000
<b>Ceramics</b>	
WBCDC Ltd, Kolkata.	0.18
<b>Chemical</b>	
Hindustan Heavy Chemicals Ltd, Khardah, Dist. 24-Parganas.	14.8 (caustic soda) 6 (Cl) 9.8 (HCl) 4.5 (ferric alum) 18.7 (H <sub>2</sub> SO <sub>4</sub> )
<b>Electrodes</b>	
Graphite India Ltd, Kolkata.	NA
<b>Fertilizer</b>	
Jay Shree Chemicals & Fertilizers Ltd, Khardah, Dist. 24-Parganas.	159.72 (SSP) 62.70 (H <sub>2</sub> SO <sub>4</sub> )
TCL-Haldia.	121.5 (N <sub>2</sub> ) 310.5 (P <sub>2</sub> O <sub>5</sub> )
<b>Glass</b>	
Hindustan National Glass & Industries Ltd, Rishra.	680 TPD
<b>Iron &amp; Steel</b>	
Durgapur Steel Plant, SAIL, Durgapur.	3070 (sinter) 2000 (pig iron) 1586 (saleable steel) 1800 (crude/liquid steel)
IISCO Steel Plant, SAIL, Burnpur, Dist. Bardhaman.	254 (pig iron) 500 (steel ingot) 9.5 (Ammonium sulphate)
Alloy Steel Plant, SAIL, Durgapur.	178 (Saleable Steel) 264 (crude/liquid steel)

(Contd.)

Table - 5 (Concl'd.)

Industry/plant	Capacity ('000 tpy)
<b>Pig Iron</b>	
Electrosteel Castings Ltd, Khardah.	110
Kajaria Iron Castings Ltd, Durgapur.	110
Tata Metaliks Ltd, Kharagpur.	90
<b>Sponge Iron</b>	
Adhunik Corporation Ltd, Durgapur.	60
Aryavrata Trading Pvt. Ltd, Lohamelya Dist. Paschim Midnapur.	36
Howrah Gasses Ltd, Raniganj, Dist. Bardhaman.	60
Jai Balaji Sponge Ltd, Raniganj, Dist. Bardhaman.	105
Rashmi Cement Ltd, Paschim Midnapur.	60
Rashmi Ispat (Pvt) Ltd, Raghunathpur, Dist. Paschim Midnapur.	60
Shyam Sel Ltd, Dewabdighi, Bardhaman.	100
Sunil Sponge Iron Ltd, Kolkata.	115
<b>Ferro-alloys</b>	
Kartik Alloys Ltd, Durgapur.	10.7
Maithan Alloys Ltd, Bardhaman.	12.5
Modern India Con-Cast Ltd, Bishnupur, Dist. Bankura.	22
Rohit Ferro-Tech Ltd, Bishnupur, Dist. Bankura.	55
Corporate Ispat Alloys Ltd, Durgapur.	40
Modern India Cone Cost Ltd, Bishnupur, Dist. Bankura.	75
Shyam Ferro Alloys Ltd, Bardhaman.	100
Shri Vasavi Industries Ltd, Bishnupur, Dist. Bankura.	45
Srinivasa Ferro Alloys Ltd, Durgapur, Dist. Bardhaman.	84.2
Shri Goyatri Minerals Pvt. Ltd, Bishnupur, Dist. Bankura.	24
<b>Refractory</b>	
Alcoa-ACC Industrial Chemicals Ltd, Kalatalahat.	10
Barazkar Refractories (P) Ltd, Barakar, Dist. Bardhaman	3.6
Kero Rajendra Monolithics Ltd, Banjora.	NA
Saswat International Ltd, Kulti, Dist. Bardhaman.	NA
Vesuvius India Ltd, Kolkata.	96.5
<b>Coke Oven Batteries</b>	
IISCO Burnpur Works, Burnpur, Dist. Bardhaman.	1084
<b>Petroleum Refinery</b>	
IOCL, Haldia.	7500
<b>TiO<sub>2</sub> Pigment</b>	
Kolmak Chemicals Ltd, Kalyani, Dist. Nadia.	4.8

(G) : Grinding units.