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(Part- I)

57th Edition

STATE REVIEWS (Rajasthan)

(FINAL RELEASE)

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RAJASTHAN

Mineral Resources

Rajasthan is the richest state in terms of availability and variety of minerals in the country and produces about 16 different minerals along with minor minerals. Rajasthan is the sole producer of lead & zinc ores, selenite and wollastonite. Rajasthan was the sole producer of garnet (gem) till 2004-05. Almost entire production of silver in the country comes from Rajasthan. The State is a major producer of copper ore/conc., limestone, ochre, phosphorite/rock phosphate and talc/ soapstone/steatite. The State is also an important producer of marble of various shades. Makrana area is the world famous centre for marble mining.

The State possesses substantial share of the total resources of potash (94%), lead & zinc ore (89%), wollastonite (88%), silver ore (88%), gypsum (82%), ochre (81%), bentonite (75%), fuller's earth (74%), diatomite (72%), felspar (66%), marble (63%), asbestos (61%), copper ore (54%), calcite (50%), talc/steatite/soapstone (49%), ball clay (38%), rock phosphate (31%), fluorite (29%), and tungsten (27%).

Important minerals that are found to occur in the State are: **asbestos (amphibole)** in Ajmer, Bhilwara, Dungarpur, Pali, Rajsamand & Udaipur districts; **ball clay** in Bikaner, Nagaur & Pali districts; **barytes** in Alwar, Bharatpur, Bhilwara, Bundi, Chittorgarh, Jalore, Pali, Rajsamand, Sikar & Udaipur districts; **calcite** in Ajmer, Alwar, Bhilwara, Jaipur, Jhunjhunu, Pali, Sikar, Sirohi & Udaipur districts; **china clay** in Ajmer, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Chittorgarh, Dausa, Jaipur, Jaisalmer, Jhunjhunu, Kota, Nagaur, Pali, Sawai Madhopur & Udaipur districts; and **copper** in Khetri belt in Jhunjhunu district & Dariba in Alwar district. Deposits of copper are also reported at Ajmer, Bharatpur, Bhilwara, Bundi, Chittorgarh, Dausa, Dungarpur, Jaipur, Jhunjhunu, Pali, Rajsamand, Sikar, Sirohi and Udaipur districts. Occurrence of other minerals, namely, **Dolomite** in Ajmer, Alwar, Bhilwara, Chittorgarh, Dausa, Jaipur, Jaisalmer, Jhunjhunu, Jodhpur, Sikar & Udaipur districts; **felspar** in Ajmer, Alwar, Bhilwara, Jaipur, Pali, Rajsamand, Sikar, Tonk & Udaipur districts; **fireclay** in Alwar, Barmer, Bharatpur, Bhilwara, Bikaner, Dausa, Jaisalmer, Jhunjhunu & Sawai Madhopur districts; **fluorspar** in Ajmer, Dungarpur, Jalore, Jhunjhunu, Sikar, Sirohi & Udaipur districts; **garnet** in Ajmer, Bhilwara, Jhunjhunu, Sikar & Tonk districts; **gypsum** in Barmer, Bikaner, Churu, Sri Ganganagar, Hanumangarh, Jaisalmer, Jalore, Nagaur & Pali districts; **iron ore (hematite)** in Alwar, Dausa, Jaipur, Jhunjhunu, Sikar & Udaipur districts; **iron ore (magnetite)** in Bhilwara, Jhunjhunu & Sikar districts; **lead-zinc** in Zawar in Udaipur district, Bamnia Kalan, Rajpura-Dariba in Rajsamand & Rampura/Agucha in Bhilwara district. Lead-zinc occurrences have also been reported from Ajmer, Chittorgarh, Pali and Sirohi districts. **Lignite** deposits are found to occur in Barmer, Bikaner, Jaisalmer, Jalore, Nagaur and Pali districts. Flux grade **limestone** occurs in Jodhpur and Nagaur districts and chemical grade limestone in Jodhpur, Nagaur and Alwar districts. Cement grade deposits of limestone are widespread in Ajmer, Alwar, Banswara, Bhilwara, Bikaner, Bundi, Chittorgarh, Churu, Dungarpur, Jaipur, Jaisalmer, Jodhpur, Jhunjhunu, Kota, Nagaur, Pali, Sawai Madhopur, Sikar, Sirohi and Udaipur districts. **Magnesite** in Ajmer, Dungarpur, Pali & Udaipur districts; **marble** in Ajmer, Alwar, Banswara, Bhilwara, Bundi, Chittorgarh, Dungarpur, Jaipur, Nagaur, Sikar, Sirohi & Udaipur districts; **mica** in Ajmer & Bhilwara districts; **ochre** in Baran, Bharatpur, Bhilwara, Bikaner, Chittorgarh, Jaipur, Sawai Madhopur & Udaipur districts; **pyrite** in Sikar district; **pyrophyllite** in Alwar, Bhilwara, Jhunjhunu, Rajsamand & Udaipur districts; **quartz/silica sand** in Ajmer, Alwar, Bharatpur, Bhilwara, Bikaner, Bundi, Chittorgarh, Dausa, Jaipur, Jaisalmer, Jhunjhunu, Jodhpur, Kota, Pali, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk & Udaipur districts; **quartzite** in Ajmer, Alwar, Jhunjhunu & Sawai Madhopur districts; **rock phosphate** in Alwar, Banswara, Jaipur, Jaisalmer & Udaipur districts; **talc/steatite/soapstone** in Ajmer, Alwar, Banswara, Bharatpur, Bhilwara, Chittorgarh, Dausa, Dungarpur, Jaipur, Jhunjhunu, Karauli, Pali, Rajsamand, Sawai Madhopur,

Table – 1 : Reserves/Resources of Minerals as on 1.4.2015: Rajasthan

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	-	-	-	-	-	-	-	51521	1016000	-	-	1067521	1067521
Asbestos	tonne	-	-	-	-	1803183	3070449	4027514	87802	42101	4526861	57800	13615710	13615710
Ballclay#	tonne	26804980	10979851	3735497	41520329	5080531	1443858	3162346	221176	218550	25262892	-	35389353	76909682
Barytes#	tonne	134416	-	72751	207167	6018	15890	108577	37808	311500	2304688	-	2784481	2991648
Bauxite	'000 tonnes	-	-	-	-	-	-	-	-	-	528	-	528	528
Bentonite##	tonne	4705000	50000	-	4755000	-	2718630	56172302	24356005	222017000	92523096	25730000	423517033	428272033
Calcite#	tonne	911597	790072	1597877	3299546	909511	182713	2873548	539746	1041668	3371912	-	8919099	12218645
China clay#	'000 tonnes	73434	29510	22493	125437	47554	26157	40542	1584	3221	294386	11428	424874	550311
Copper														
Ore	'000 tonnes	15333	-	29718	45051	11110	228	51226	18603	102088	580541	4480	768276	813327
Metal	'000 tonnes	175.12	-	433.55	608.67	12.94	3.29	492.46	338.66	699.24	2291.94	28.61	3867.14	4475.81
Corundum	tonne	-	-	-	-	-	-	-	-	-	11925	-	11925	11925
Diatomite#	'000 tonnes	-	-	-	-	634	-	-	-	-	1440	-	2074	2074
Dolomite#	'000 tonnes	57910	4579	13994	76483	20483	10807	121082	16132	25480	327838	784	522607	599089
Felspar#	tonne	161965311	102283772	41417085	305666168	35514780	40938272	33919764	12410200	8488066	132329070	2866777	266466928	572133096
Fire clay#	'000 tonnes	6561	-	3932	10493	1548	1718	697	2256	2580	35363	-	44163	54656
Fluorite	tonne	-	-	-	-	631630	592258	562023	1528348	489488	1294529	145183	5243458	5243458
Fullers Earth##	tonne	3941000	-	-	3941000	-	-	-	-	350000	190409080	-	190759080	194700080
Garnet	tonne	33566	35926	5556	75048	3100	26663	29629	5207	21432	123587	333	209952	285000
Gold														
Ore (Primary)	tonne	-	-	-	-	-	-	-	4600000	50193000	69747720	63000	124603720	124603720
Metal (Primary)	tonne	-	-	-	-	-	-	-	6.67	103.34	123.03	0.07	233.11	233.11
Granite## (Dimension Stone)	'000 cum	5581	100380	4500	110461	38462	-	-	-	-	9021742	20000	9080204	9190665
Graphite	tonne	-	-	-	-	47600	-	165920	-	250000	1450034	-	1913554	1913554
Gypsum#	'000 tonnes	23617	153	658	24428	6201	82814	18663	750	710604	236847	-	1055878	1080306
Iron ore (Hematite)	'000 tonnes	2103	2175	380	4658	8764	6105	471	-	11510	6897	-	33745	38404
Iron ore (Magnetite)	'000 tonnes	17148	2185	16090	35423	595	460	10113	-	-	554904	15422	581493	616916
Kyanite	tonne	-	-	-	-	13097	-	10606	-	-	-	-	23703	23703
Laterite#	'000 tonnes	-	-	-	-	-	-	-	-	-	60490	62860	123350	123350

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Table - 1 (Concld.)

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						
Lead-Zinc Ore	'000 tonnes	31662	68687	5767	106116	2965	12888	29734	28779	170547	317929	1380	564222	670338
Lead metal	'000 tonnes	624.56	1666.02	191.76	2482.34	45.21	390.22	733.23	490.82	1860.47	5462.09	-	8982.04	11464.38
Zinc metal	'000 tonnes	2871.75	6728.14	399.63	9999.52	235.38	772.17	1289.91	1514.15	7145.53	13435.31	0.53	24392.98	34392.5
Lead-Zinc metal	'000 tonnes	-	-	-	-	-	-	-	-	-	119.86	22.37	142.23	142.23
Limestone	'000 tonnes	2471143	933889	863351	4268382	367799	1538090	4529048	596071	761855	11365794	939808	20098465	24366847
Magnesite	'000 tonnes	-	-	-	-	912	1589	2121	-	149	49033	-	53804	53804
Manganese ore	'000 tonnes	1051	-	647	1697	-	-0	-	-	-	4030	-	4030	5727
Marble##	'000 tonnes	-	-	-	-	104236	173875	25703	-	90000	837615	-	1231429	1231429
Mica#	kg	20245098	1742047	12209547	34196692	19292500	10605400	5732418	49522483	16922016	36385724	3415315	141875856	176072548
Ochre#	tonne	15009099	4253584	8474360	27737043	42838694	11819905	23478699	1824210	942087	21728459	841236	103473290	131210333
Potash	million tonnes	-	-	-	-	-	-	-	-	16936	3462	22	20419	20419
Pyrite	'000 tonnes	-	-	-	-	13667	-	22917	9590	26310	18392	-	90876	90876
Pyrophyllite#	tonne	368774	214870	179514	763158	156136	38989	210982	219612	119469	551225	-	1296413	2059571
Quartzite#	'000 tonnes	140	-	86	226	-	18	18	-	-	706	-	742	968
Quartz-Silica sand#	'000 tonnes	239131	58049	51719	348900	160380	34587	50216	5464	8001	131816	1098	391561	740462
Rock Phosphate	tonne	37833537	-	477000	38310537	1154961	20857437	4453355	152633	79750	28043783	2627650	57369569	95680106
Sillimanite	tonne	-	-	-	-	300	-	519	-	-	-	-	819	819
Silver														
Ore	onne	58657075	6683000	72753828	138093903	-	88200	29524218	27732000	60240000	191542579	-	309126997	447220900
Metal	tonne	4307.07	220.53	2641.39	7168.99	-	0.26	127.57	1876.39	3045.91	17140.37	-	22190.5	29359.49
Talc-Steatite-Soapstone#	'000 tonnes	52812	2989	22189	77990	11249	6167	17498	1640	858	63411	151	100975	178965
Tungsten														
Ore	tonne	-	-	-	-	-	-	-	-	963666	17000628	5964000	23928294	23928294
Contained WO_3	tonne	-	-	-	-	-	-	-	-	1421.44	90171.5	2115	93707.94	93707.94
Vermiculite	tonne	-	-	-	-	20623	2759	4428	-	13000	2883	-	43693	43693
Wollastonite	tonne	1953384	48075	240003	2241462	3750118	12000	3748191	76088	3325042	1322852	-	12234291	14475753

Figures rounded off

Note: The proved and indicated balance recoverable reserves of Crude Oil and Natural Gas as on 1.4.2018 are 17.99 million tonnes and 54.85 billion cu m, respectively.

 # Declared as Minor Mineral vide Gazette Notification dated 10.02.2015.

Minor Mineral before Gazette Notification dated 10.02.2015.

Sirohi, Tonk & Udaipur districts; **vermiculite** in Ajmer & Barmer districts; and **wollastonite** in Ajmer, Dungarpur, Pali, Sirohi & Udaipur districts.

Other important minerals that occur in the State are: **apatite** in Udaipur & Sikar districts; **bauxite** in Kota district; **bentonite** in Barmer, Jaisalmer & Jhalawar districts; **corundum** in Tonk district; **diatomite** in Barmer & Jaisalmer districts; **emerald** in Ajmer & Rajsamand districts; **fuller's earth** in Barmer, Bikaner & Jodhpur districts; **gold** in Banswara, Bhilwara, Dausa, Sirohi and Udaipur districts; **granite** in Ajmer, Alwar, Banswara, Barmer, Bhilwara, Chittorgarh, Jaipur, Jaisalmer, Jalore, Jhunjhunu, Jodhpur, Pali, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk & Udaipur districts; **graphite** in Ajmer, Alwar & Banswara districts; **kyanite** and **sillimanite** in Udaipur district; **manganese ore** in Banswara, Jaipur, & Pali districts; **potash** in Jaisalmer & Nagaur districts; **silver** in Ajmer, Bhilwara, Jhunjhunu, Rajsamand, Sikar & Udaipur districts; and **tungsten** in Nagaur & Sirohi districts (Table - 1). District-wise reserves/resources of lignite in the State are provided in Table-2.

Deposits of **petroleum** are located in the Bikaner-Nagaur and Barmer-Sanchore basin and those of **natural gas** in Jodhpur and Jaisalmer basins in the State.

Exploration & Development

National Oil Companies (NOC) continued their seismic survey for petroleum and natural gas during 2017-18.

The details of exploration activities conducted by various agencies GSI, MECL, HZL, State DMG, RSMML etc. for limestone, gold, base metals (Cu,Pb & Zn), lignite and other minerals including minor minerals during the year 2017-18 are furnished in Table - 3.

Production

Production of different type of of minerals has been reported from the state of Rajasthan.

The value of minor minerals production was estimated at ` 9,868 crore for the year 2017-18.

The number of reporting mines in Rajasthan was 81 in the year 2017-18 in case of MCDR minerals (Table-4).

Table – 2 : Reserves/resources of Lignite as on 1.4.2018 : Rajasthan

(In million tonnes)

District	Proved	Indicated	Inferred	Total
Total	**1168.53**	**3029.78**	**2150.77**	**6349.08**
Barmer	495.23	2509.46	1496.77	4501.46
Bikaner	560.30	230.33	309.19	1098.82
Jaisalmer & Barmer (Khuri)	-	-	13.80	13.80
Jaisalmer & Bikaner	-	-	9.26	9.26
Jalore	-	-	76.08	76.08
Nagaur & Pali	-	0.50	18.69	19.19
Jaisalmer	-	-	70.44	70.44

Source: *Coal Directory of India, 2017-18.*

Table – 3(A) : Details of Exploration Activities in Rajasthan, 2017-18

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Base-metals							
Alwar	Pai ka Guwara block Tehla-Bighota area	1:2000	2.0	2	-	-	Preliminary exploration for base-metals and associated precious metals was carried out in Tehla-Bighota area, Rajgarh tehsil. An area of 2.0 sq km was mapped on 1:2000 scale. Drilling in two boreholes were completed and one in progress. Mineralisation is observed in the form of pyrite, pyrrhotite, chalcopyrite and chalcocite. The analytical results of BRS indicate maximum 0.3% Cu, 0.20% Zn, 0.34 ppm Au and 470 ppm Ni. Two mineralised zones viz. MZ-1 & MZ-II based on surface manifestations including presence of intense malachite stains and fresh sulphides in the form of pyrite, pyrrhotite, chalcopyrite and chalcocite were demarcated.
Base-metals & Precious metals							
Alwar	Khera North block Mundiyawas Khera area	-	0.9	-	-	-	Preliminary Exploration for base-metals and associated precious metals in Mundiyawas-Khera area was carried out involving mapping of 0.9 sq km area by detailed geological mapping. The host rocks of Cu mineralisation viz. felsic meta-volcanic, tremolite bearing dolomitic marble and cherty quartzite are observed. Surface manifestations of mineralisation marked by malachite stains and presence of fresh sulphides in form of chalcopyrite, arsenopyrite, pyrrhotite, and galena were observed within felsic volcanics as well as tremolite bearing dolomitic marble. A scapolite bearing zone was observed in western part of detailed mapping area.
Copper and associated Precious metals							
Alwar, District	Mundiyawas Block	-	-	-	2435	-	General exploration for copper and associated precious metals was carried out in Mundiyawas - Khera area. A total of 2435 m of drilling covering a strike lengh of 470 m, besides 100 cu m of pitting-trenching carried out along 8 nos of channels were completed. All the boreholes drilled intersected considerable sulphide mineralisation in the form of specks, stringers, disseminations, vein filled and occasionally massive chalcopyrite, pyrrhotite and arsenopyrite. The analytical results of channel samples indicate a 7 m zone with 0.41% Cu. The part analytical results of borehole RJMU-12 indicate a 2.05 m x 0.37% Cu (at 0.2% cut off) between 110.80 m to 112.85 m depth. The part analytical results of borehole RJMU-127 indicate a 2.50 m x 0.23% Cu (at 0.2% cut off) between 92.10 m to 94.60 m depth.

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Copper, Gold and Silver							
Alwar,	Khera SE block Block	-	-	-	1963.75	-	General exploration for copper and associated gold and silver mineralisation was carried out in Mundiyawas-Khera area. A total of 1963.75 m of drilling covering a strike length of 260 m besides 105 cu m of pitting-trenching with collection of 100 PTS were completed. All the boreholes drilled, have intersected significant sulphide mineralisation in the form of specks, stringers, disseminations, vein filled and foliation parallel pyrrhotite, chalcopyrite and arsenopyrite. A borehole analytical results indicate a 9.35 m x 0.35% Cu (at 0.2% cut off) between 52.55 m -61.90 m depth. Drilling is continuing.
Copper and Associated Precious Metals							
Alwar	Jhiri-Piplai-Kalaid-Lothawas block	1:12500	107	-	-	463	Reconnaissance survey for copper and associated precious metals involved mapping of 107 sq km area on 1:12500 scale with collection of 312 BRS, 51 PTS, 20 PCS, 35 PS, 21 OM, 10 XRD and 11 EPMA samples. The surface indication of mineralisation is observed in the form of old working, ferruginisation, brecciation and occasional occurrences of malachite staining. The grab samples collected from ferruginised rocks shows high value of Cu ranging from 0.14 to 0.43%. Channel/ trench laid over the mineralised zone show 40 m x 0.35% Cu and Co ranging from 230 ppm to 0.4%.
Basemetal							
Alwar & Dausa	Kaled, Jaisinghpura Nimla areas	1:12500	50	-	-	272	Reconnaissance survey for basemetal involved large scale mapping of 50 sq km area on 1:12500 scale with collection of 200 BRS, 20 PCS, 22 PS, 20 OM, 05 XRD and 05 EPMA samples. In Kaled and Jaisinghpura and Paimpura areas, mineralisation has been seen in the form of malachite staining, limonitisation, ferruginous encrustation, specks of pyrite and chalcopyrite. Chalcopyrite, covellite and pyrrhotite occur as smaller, disseminated isolated primary grains.
Chittaurgarh	Jashma ridge area	1:2000	1.52	-	-	448	During reconnaissance survey for basemetal an area of 1.52 sq km was mapped on 1:2000 scale and collected of 320 BRS, 106 PTS, 16 PS and 06 samples each for OM and XRD samples. The massive quartzite in the central part of the Jashma Ridge is brecciated at places along NW-SE trending fractures is ferruginised and oxidised at places. Bedrock samples have been collected from the ferruginised unit for basemetal and Au analysis.

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Basemetal							
Dungarpur	Dewal-Methali (Metali)-Khan mine area	1:25000	100	-	-	350	Reconnaissance survey for basemetal mineralisation involved mapping of 100 sq km on 1:12500 scale with collection of 259 BRS, 50 PTS, 07 PCS, 12 samples each for PS & OM and 10 XRD samples. The surface evidences of copper mineralisation were observed in the form of malachite stains, gossanisation within magnetite quartzite and associated phyllite and ultramafics. Development of magnetite was also observed within serpentinite. A band of Wollastonite with length of 300 m and width of about 50 m was recorded in the western part of Dewal Village.
Copper							
Jhunjhunu	Between Bokri and Malwali prospects	-	-	6	1054.2	570	During preliminary exploration for copper mineralisation of the Eastern Khetri Metallotect a total of six boreholes were drilled to a total depth of 1054.2 m and collected 550 CS and 20 PCS. The Babai-Tonda Lineament is the host rock for copper mineralisation. The boreholes were planned to intersect mineralised zone at 60 m vertical depth. Chalcopyrite is the main ore mineral in the mineralised zone and it occurs as specks and disseminations within the brecciated rock, both in clast as well as matrix.
	Malwali block	1:2000	0.75	-	-	385	Preliminary exploration for copper and associated mineralisation in the northeast continuity of Malwali block, eastern Khetri Metallotect involved mapping of 0.75 sq km on 1:2000 scale and collection of 350 BRS, 20PS, 10 OM and 05 EPMA samples. Silicified quartzite, brecciated rock, amphibolite, banded amphibole quartzite, calc-silicate rock, quartz mica schist, hornblende schist, banded magnetite quartzite, pegmatite, quartz and albitite vein are the main rock types identified. Six old workings were marked. Mineralisation in the form of malachite staining continues to occur in the brecciated rock.
Rajsamand	Gangas block	-	-	15	3665.45	1409	General Exploration for Copper and associated mineralisation in Mangalwar Complex involving a total 3665.45 m drilling in 15 boreholes with collection of 1409 CS. Out of 15 nos of boreholes, 07 nos of boreholes were of first level, 06 boreholes of second level intersections and 02 boreholes of third level intersections. All fifteen boreholes except one borehole have intersected significant copper mineralisation.

(Contd)

Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Basemetal							
Sikar	Khora block Bhudoli-Basadi area	-	-	11	2278	787	Preliminary exploration for basemetal mineralisation in Bhudoli-Basadi area comprises drilling of 11 boreholes to a total depth of 2278 m and collection of 787 CS. The general strike of bedding is N10°E-S10° W with steep dip on both sides. The mineralisation is in the form of fine specks of chalcocite, bornite and native copper as dissemination, later remobilised along veins/veinlets of quartz/ calcite/ epidote/ albite/ K-feldspar occasionally with covellite and chalcopyrite.
	Dhabala West block Kharagbinjpur area	-	-	7	1088	-	Preliminary Exploration for basemetal mineralisation in this area involved a total of 1088 m drilling in 07 boreholes. All the boreholes intersected impure marble with calcite and quartz veins/ veinlets. The mineralisation is in the form of very fine specks of bornite and chalcocite dissemination, occasionally with chalcopyrite, native copper and covellite.
	Eastern part of southern extension of Nanagwas block	-	-	9	1632.80	-	Preliminary exploration for basemetal was taken up by drilling 09 boreholes to a total depth of 1632.80 m. Five boreholes were of first level and 04 boreholes second level. The analytical results of first level boreholes RJSNE-01 indicate the significant mineralised zones. Borehole RJSNW-01 intersected mineralised zone between 76.25 m to 82.5 m of Cu 0.23%; Borehole RJSNW-03 intersected mineralised zone between 47.75 m to 60.05 m of Cu 0.35%; Borehole RJSNE-04 intersected mineralised zone between 63.25 m to 69.35 m of Cu 0.4%.
	Ganeshwar-Dariba area Nim Ka Thana	1: 12500	117	-	-	466	Reconnaissance Survey for basemetal in Nim Ka Thana involved large scale mapping of 117 sq km on 1: 12500 scale with collection of 400 BRS, 21 PCS, 12 PS, 23 OM, 05 each XRD and EPMA samples. The area is represented by the quartzite with patches of mica schist. Copper mineralisation in the form of malachite, chalcopyrite and bornite is present within the impure micaceous marble. Copper mineralisation in the form of malachite stains and specks of chalcopyrite observed in the impure marble, quartzite and malachite stains in mica schist in Hirwala area.
Copper							
Sikar	South Ghatiwala block	1:2000	1.50	-	-	482	Preliminary exploration for copper involved detailed geological mapping on 1:2000 scale covering an area of 1.50 sq km besides 482 nos of BRS including 200 nos of channel sample from 10 nos of channels and 51 cu m of

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							pitting-trenching. Five prominent mineralised zones viz. MZ-I to MZ-V have been demarcated on the basis of surface indication of copper mineralisation in the form of malachite stains, fresh sulphides i.e. chalcocite, bornite and chalcopyrite. The width of mineralised zones on surface varies from <1 to 40 m. The chemical analytical results of channel-01 indicate three mineralised zones viz. 07 m x 0.19% Cu; 05 m x 0.36% Cu and 02 m x 0.11% Cu; channel-02 indicates one mineralised zone 12 m x 0.13% Cu and channel-03 indicate 01 m x 0.10% Cu and 01 m x 0.11% Cu.
Udaipur	Ladana extension area	1:12500	50	-	-	291	Reconnaissance survey for copper mineralisation was taken up involving large scale mapping of 50 sq km area on 1:12500 scale with collection of 155 BRS, 56 PTS, 55 SS, 15 PS, 05 each for OM and XRD samples. The mineralisation is seen within quartz veins. Four mineralised fragmentary quartz veins with encrustations of malachite and specks of pyrite & chalcopyrite were noted around Ladana village. A mineralised limonitised quartz vein of size 10 m x 70 m with encrustations of malachite and specks of pyrite & chalcopyrite has been recorded. Another ferruginous quartz vein of dimension 10 m x 120 m with encrustations of malachite and disseminations of pyrite, bornite, chalcopyrite has been observed. Towards the north of Khartana village, metasedimentary sequence occurs including quartz mica schist, gritty quartzite, amphibole schist, dolomite, garnetiferous amphibolites, etc.
REE and RM							
Barmer	Redana area	1:12500	100	-	-	-	Reconnaissance survey for REE and RM mineralisation in and around Redana area, was carried out by mapping of 100 sq km on 1:12500 scale. The rocks of Malani Igneous Suite and Unclassified Delhi supergroup are exposed in the area. The major litho-units in the area are pink granite, leucocratic granite and E-W trending later felsic and mafic bodies/ dykes. Inter-tonguing relationship between the Siwana type granite and basement pink granite was recorded. Felsic and basic bodies range in width from 2 m to about 50 m with lateral extension of 100 m to 1.5 km. Bedrock samples were collected from different litho-units. Petrographic studies of intrusive Siwana type granite reveals that the rocks are mainly

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							composed of feldspar, quartz along with alkali amphibole.
REE							
Barmer	Siwana area	1:12500	100	-	-	271	During reconnaissance survey for REE mineralisation in this area, an area of 100 sq km was mapped on 1:12500 scale and collected 200 BRS, 25 PTS, 21 PS, PCS & EPMA 10 samples each and 5 XRD samples. Two major rock suites i.e. plutonic phase and volcanic phase were observed. The plutonic phase consists of coarse grained porphyritic granite and is the youngest unit in the area. Volcanic phase consists of three rock types.
Bhilwara	Phulia – Umedpura - Bhimpura area	1:12500	100	-	-	353	Reconnaissance survey for REE and associated mineralisation in Phulia – Umedpura - Bhimpura area was carried out involving mapping of 100 sq km on 1:12500 scale. The area exposes mainly composite gneisses and migmatites. Composite gneisses include banded gneisses, streaky gneisses and porphyritic/ augen gneisses. One gabbroic body showing spheroidal weathering is noted in south of Phullya. The general trend of gneissosity is NE-SW dipping at high angle towards NW. Three new basic intrusive bodies were identified. Total 250 BRS, 52 PTS, 16 PS, 11 XRD, 15 OM and 09 PCS were collected.
Rare metals							
Sirohi	Sibagaon area	1:1000	1.5	-	-	624	Reconnaissance survey for rare metals mineralisation was carried out in Sibagaon area. The survey comprised detailed mapping of 1.5 sq km on 1:1000 scale with collection of 564 BRS samples, 50 PTS and 10 PCS samples. The rock types in the study area are mainly calc-silicate, quartzite, dolomitic marble, mica schist, granite gneiss and pegmatite. Other rare metal rich minerals such as lepidolite, spodumene and beryl are also present in pegmatites. Chemical analyses by hand held XRF has revealed very high value ranging fron1098 ppm to 5141 ppm of Rb in pegmatites only. Sr mineralisation is also present in pegmatites and in calc-silicates. Sr value in ranges from 36.40 ppm to 1618 ppm and in pegmatites it varies from 0 to 407.14.
REE and Tungsten							
Jalore/Bhilwara	Jaswantpura-Pander	1:12500	100	-	-	249	Reconnaissance survey for REE and Tungsten in this area, was carried out by large scale mapping of 100 sq km on 1:12500 scale and collection of 215 BRS, 30 PTS and 4 XRD samples were carried out. The rock types exposed in the area are mainly migmatite gneiss/ augen gneiss, calscilicate rock/ calc gneiss and garnetiferous mica schist,

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							dolomite and amphibolite which are intruded by pegmatite and quartz veins. Pegmatite thickness ranges from few cm to 5 m.
Tungsten, gold and silver							
Jaipur	Daganwada area	1:12500	100	-	-	307	Reconnaissance survey for Tungsten, gold and silver mineralisation in and around Daganwada area, was carried out by mapping of 100 sq km on 1:12,500 scale with collection of 203 BRS, 25 PTS, 08 SS, PS, 10 ORM/OM, 51 PCS, 05 EPMA and 05 XRD samples. The rocks present in the area are represented by silicified/ ferruginised quartzite, granite gneiss, chlorite schist, gritty/ feldspathic quartzite and dolomitic/ impure marble with thin bands of grey quartzite, vitreous white quartzite. These rocks are intruded by thin quartz veins and basic dykes. Granites are exposed in the form of scanty outcrops within the thick alluvium cover. Two varieties of granite i.e. porphyritic and non-porphyritic are exposed in the study area.
Tungsten and associated mineralisation							
Nagaur	Rewat hill Degana	-	-	36	1754	450	Preliminary exploration for tungsten and associated mineralisation was carried out around this area. A total 1754 m of drilling and collection of 450 core samples from 36 drilled boreholes has been completed. Rock types exposed in the area mainly include granite. Numerous quartz and pegmatite veins intrude the granite. Wolframite mineralisation has been observed within quartz veins. Concentration of tungsten mineralisation is more along quartz veins/ pegmatite veins intruded in granite. Analytical result of 70 core samples of borehole RJDB-1 indicate that W values ranges between 86.60 ppm to 4924.37 ppm with an average of 782.21 ppm. XRD analysis shows two phases of tungsten bearing minerals present in the area viz. Ferberite ($FeWO_4$) and Huebnerite ($MnWO_4$).
Tungsten, Tin and associated mineralisation (W, Sn)							
Sirohi	Dewa-Ka-Bera Saliyon ka Bera & Bara Bera area	1:12500	100	-	-	246	G4 stage Reconnaissance survey for W, Sn and associated rare metals mineralisation was taken up in this area which is comprising of large scale mapping of 100 sq km area on 1: 12,500 scale with collection of 226 nos BRS and 20 nos PCS samples have been carried out. The Delhi Supergroup is constituted of phyllite intercalated with schist/ quartzite, calc silicate, quartzite & mica schist. In the south-eastern part, coarse to medium grained tourmaline rich pegmatite were sampled for tin & tungsten mineralisation. Scheelite mineralisation is associated with the intrusive contact of granite & calc silicate rocks.

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Tungsten and lithium							
Sirohi	Sohela-Karola area	1:12500	100	-	-	246	Reconnaissance survey for tungsten and lithium was taken up in this area. The survey comprises large scale mapping of 100 sq km on 1:12,500 scale with collection of 252 nos BRS, 50 nos PTS, 305 nos PCS and 50 nos PS samples. The different lithology demarcated include gneisses, quartzite, mica-schist, amphibolite and amphibole marble rocks. These are intruded by pegmatite, metabasic dyke and quartz-tourmaline veins. Surface indications of mineralisation are in the form of malachite stains in the quartzite and calc silicate rocks and magnetite rich bands within the quartzites. Samples from pegmatite rich zones have been collected to know the presence of tungsten and associated mineralisation.
	Kotariya-Pipaliya-Gurha area	1:12500	130	-	-	30	Reconnaissance survey for tungsten and lithium was taken up in this area. The project involved large scale mapping of 130 sq km on 1:12500 scale with collection of 30 PTS samples. The major litho units exposed in the area are granite, mica schist, conglomerate and pegmatites. Well developed tourmaline crystals (few mm to 4cm along longer axis), feldspar, muscovite and quartz are very common within pegmatite. Trenches have been laid in pegmatites intruding biotite bearing granite and biotite-muscovite schist. Clusters of large tourmaline crystals have been identified in pegmatite.
Gold and Associated metals							
Pratapgarh & Udaipur	Devla Pal & Narwari	1:12500	100	-	-	445	Reconnaissance survey for gold and associated metals mineralisation was taken up in areas between Devla Pal and Narwari. The survey involved large scale mapping of 100 sq km on 1:12500 scale with collection of 445 samples. Major rock types exposed in the area include quartzite, phyllitic dolomite, slate, dolomite, dolomitic marble, dolomitic phyllite and carbonaceous phyllite. Surface indication of mineralisation is observed in the form of ferruginisation, malachite stainings, sulphide dissemination and presence of old workings. Based on surface evidences, two mineralised zones was delineated and systemically sampled.
	Nandavel & Dhandawali areas	1:12500	10	-	-	445	Reconnaissance survey for gold and associated mineralisation was taken up between Nandavel and Dhandawali areas. The investigation involved LSM of 100 sq km on 1:12,500 scale along with collection of 445 samples. The rocks exposed comprises of mainly

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							garnet mica schist, quartzite and amphibolites which are intruded by quartz and pegmatite veins. On the basis of old workings, malachite staining and wall rock alteration, a 1.5 km long and 2 m to 5 m wide zone has been demarcated in chlorite schist about 1.25 km northwest of Nandavel village. This zone has been systemically sampled.
Potash							
Ganganagar	Satipura sub-basin of Nagaur	-	-	8	6250.60	2604	A G3 level preliminary exploration for potash was carried out in Ganganagar evaporite basin. Two core sample of borehole RJNGS-01B indicates significant K_2O value of 13.85% and 13.73%. Again two core samples of borehole RJNGS-04A also indicates high values of K_2O i.e. 20.72% and 25.29%. Core sample of borehole RJNGS-02 also indicates significant 20.72% K_2O.
Limestone							
Jaisalmer	Area South of Khuiala	1:12500	125.0	13	-	123	G4 stage reconnaissance survey for SMS/ cement grade limestone was taken up in this area south of Khuiala. Limestone/ clayey limestone were intersected in eight boreholes. In borehole RJK 05, 8.10 m thick hard and compact limestone was intersected from the ground level and clayey limestone of 11.80 m thickness intersected up to a depth of 21.30 m with thin clay partings. In borehole RJK-10 a total width of 29.50 m clayey limestone was intersected.
	Pohar area	1:12500	125.0	15	-	123	G4 level survey for SMS/ cement grade limestone was taken up in Pohar area. Boreholes were drilled between 30 m to 50 m in depth. Low silica limestone was intersected in upper 10 m depth. The thickness of individual bands of limestone is from 0.20 m to 1.50 m.
	Tanasar (east) block	1:12500	9.6	15	747.0	224	G3 level exploration for low silica SMS grade limestone was carried out in Tanasar (East) block. The grey brownish shale and greyish-white coarse grained foraminiferal limestone is seen in the southwestern part. Limestone of Bandah Formation cumulative thickness varies from 2.99 m to 16.66 m and intersected clay thickness ranges from 14.59 m to 39.40 m. Intersected thickness (cumulative) of limestone of Khuiala Formation varies from 0.7 m to 12.00 m.
	Tanasar (west) block	1:12500	6.4	10	501.0	112	Preliminary exploration for low silica SMS/Cement grade limestone was carried out in the study area. Limestone of Bandah Formation intersected ranges in thickness (cumulative) from 6.99 m to 16.61 m and intersected cumulative thickness of clay ranges from 26.95 m to 38.01 m. Intersected cumulative

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							thickness of limestone of Khuiala Formation ranges from 0.97 m to 3.66 m. In tone borehole pyritiferous shale containing forams and carbonised remains of plant was intersected at 27.40 m depth.
DMG							
Lignite							
Bikaner	N/v Diyatra	1:50000	-	3	285.00	10	During 2017-18 exploration programme was undertaken. A total 285.00 m of drilling in 3 boreholes were carried out and 10 samples were collected. The thickness of lignite seam is 5.00 m and average thickness of overburden is 157.00 m. The progressive average of lignite/ overburden ration is 1:24.18. During the year, lignite shale reserves has been estimated at 1.04 million tonnes.
Iron ore							
Jaipur	Morija Tehsil Chomu	1:50000 1:10000 1:4000	100 20 2.10	-	-	28	Exploration to prove iron ore reserves was taken up near village Morija, Tehsil Chomu. During exploration work, iron ore bands and open pit of iron have been marked. The area covering 100 sq km was mapped on 1:50000, 20.00 sq km on 1:10000 scale and 2.10 sq km on 1:4000 and collected 28 samples for chemical analysis. Besides, 30 L. km covered in geophysical survey.
Alwar	Nalpur, Sanoli, Dughera, Tehsil Behror	1:50000 1:10000 1:4000	100 10 1.0	- - -	- - -	8 - -	State directorate has carried out exploration for iron ore, manganese ore and other economic minerals near villages Nalpur, Sanoli, Dughera, Tehsil Behror. Exploration involved mapping of 100 sq km on 1:50000 scale, 10 sq km on 1:10000 scale, 1 sq km on 1:4000 scale and collected 8 samples.
Limestone (Yellow)							
Jaisalmer	Jajiya Kuldhra Bhojaniyon Ki dhani, etc.	1:50000 1:10000 1:2000	50.00 10.00 2.00	-	-	-	Thickness of SMS grade limestone varies from 6.75 m to 15.00 m and underlying chalky cement grade limestone varies from 27.00 m to 38.00 m. The exploration will contiune.
Limestone (SMS and cement grade)							
Jaisalmer	N/v Sam	1:10000 1:6336	15.00 3.00	15	600.00	500	Thickness of SMS and cement grade limestone varies from 6.75 m to 15.00 m and chalky grade limestone from 27.00 m to 38.00 m. The exploration will continue.
Limestone (Cement grade)							
Chittorgarh	Samriya Kalan Nalhuramji Ka Khera, Meghniwas and Mandna Begun-Taluka.	1:10000 1:4000	5.00 3.00	-	-	-	The limestone band mapped in the area having strike length of 8.5 km with width of more than 2 km. The exploration will contiune. The limestone is massive compact fine grained, grayish, purplish-pink coloured. Reserves will be estimated by exploration.

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Limestone							
Bhilwara	Ratiyakhera, Dhakarkhedi, Dola ka Jhopda, Biharipura, Rampuriya, Daulji ka Khera and Ladpura, Mandalgarh Tehsil.	1:10000 1:4000	30.00 6.75	6	324.00	261	Exploration will continue in field session 2018-19. Reserves/Resources were not estimated.
Nagaur	N/v Desh, Jayal Tesil.	-	-	7	313.00	-	Exploration by drilling has been carried out on 800m x 800m and 1600m x 1600m grid pattern and resources estimated at about 149.65 million tonnes of cement grade limestone. Further drilling will continue in field session 2018-19. About 149.65 million tonnes resources were estimated.
Limestone, Marble, Granite							
Pali	N/v Sarangawas, Sonana and Aana, Tehsil Desuri	1:5000 1:1000 1:4000	100.00 10.00 2.00	2	190.00	38	Limestone encountered in boreholes is grayish to dark grayish in colour and medium grained and crystalline. Limestone seems to be of cement grade. Bands of Marble have been located west of village Sarngwas over a strike length of 500 m with width varying from 100 m - 215 m. The second phase drilling will be carried on 400 m x 400 m grid pattern in field session 2018-19.
Alwar	N/v Badh Beleta, Raini	-	-	2	51.5	-	Limestone possibilitise could not be established in the area.
Jaipur and Alwar	N/v Bithloda, Mandha, Bhankri, Karoi, Nayabas, etc.	1:4000	3.20	1	33.0	-	Exploration was taken up to prove cencealed limestone reserves in gap areas of Kotputli limestone belt.
Jhunjhun and Sikar	N/v Parasrampura, Gothra	1:4000	2.00	-	-	-	-
Sirohi	Aburoad Tehsil, Pindwara	1:10000 1:4000	10.00 1.00	6	400.00	64	The marginal cement grade limestone resources estimated at 1.69 million tonnes under indicated category and 0.79 million tonnes under inferred category.
Limestone							
Ajmer and Nagaur	Around villages Pilwa, Chinwali, Dhandota, etc.	1:50000 1:6000 1:4000	150.0 15.0 02.0	-	-	16	The limestone exposed to east of village Jhak. Few isolated outcrops of impure limestone was exposed due 1 km east of Jakholai.
Dolomite and other economic minerals							
Pratapgarh	N/v Pipliya, Karnal, Bikalwas, Vijaniya, etc Tehsil Dariyawad	1:50000 1:10000 1:4000	50.0 10.0 1.0	-	-	-	The dolomite is intermittently exposed for about a strike length of 4.4 km with width of 50-150 m. Limestone occurring as thin band of 1-2 m and seems to be siliceous in nature.

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Table – 3 (A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Rajsamand	N/v Unwas, Khamnor Semal, Semalli Bhagal, Asi Bavri, etc., Khamnor Tehsil, Nathdwara.	1:10000 1:4000	20.00 1.00	-	-	14	Two dolomite bands have been mapped i.e. one from village Khamnor is Kalore of strike length of 7.5 km with an average width of 1.5 km and another from Karoli Ki Dhani to Asi Bavri of strike length of 7.00 km with an average width of 1.00 km. Chemical analysis result awaited.
Limestone (Yellow)							
Jaisalmer	N/v Jajiya	1:50000 1:10000 1:40000	50.0 10.0 02.0	-	-	-	About 0.5 sq km potential area of yellow limestone suitable for dimensional stone having thickness from 0.5 m to 1.50 m have been located n/v Jajiya Dedha, Bhojaniyon Ki Dhani.
Bhilwara	N/v Chnadgarh, Raghunathpura, and Jeeva Ka Khera, etc. Tehsil Kotri	- 1:10000	- 20.0	2	86.0	-	Prospecting results are not encouraging.
Clay, Lignite, Silica Sand, etc.							
Nagaur & Churu	Lalgarh, Surpaliya and, Jogalsar, etc.	1:50000	300.0	-	-	01	Not estimated.
Sandstone							
Jodhpur	N/v Kasti, Tehsil Baori,	1:50000 1:10000 1:4000	200.00 10.00 2.00	-	-	15	Not estimated.
Baran	N/v Nahargarh, Motipura, Durjanpura, Gigchi, Badiura, Tehsil-Kishanganj	1:50000 1:10000 1:4000	150.0 25.00 3.00	-	-	-	-
Bikaner	N/v Dulmera, Tehsil Lunkaransar	1:50000	300.00	-	-	02	No promising occurrence of sandstone were found.
Silica sand							
Karauli	N/v Bariya, Gothra, Rampura, Kodai, Tehsil Karauli & Sapotra	1:50000 1:10000 1:4000	150.00 30.00 2.00	-	-	12	Silica sand resources estimated at 20.225 million tonnes.
Manganese ore							
Bhilwara	RINL Block I&II, Phase II	-	-	16	1462.0	1648	A G2 level exploration was carried out with the objective to explore the presence of ore body and estimation of available resources in the Block I and II. Out of the total estimated iron ore resources of 27.18 million tonnes, about 3.566 million tonnes with 22.58% Fe has been estimated under indicated category and about 23.602 million tonnes with 22.55% Fe under inferred category.

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Table – 3(A) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Gypsum							
Nagaur	N/v Jodhyasi, Mandha, Hinguniya, Titri and Chau.	1:50000	300.0	-	-	-	Object of exploration was to locate new workable areas of chemical & cement grade. Deep seated gypsum beds were found around this village.
Marble							
Banswara	N/v Asoda, Gara Himmatshing, Bassi Chandsing and Lasara. Tehsil Garhi.	1:2000	2.25	-	-	-	The marble band is intermittently exposed for about 7 km strike length with width of 30 to 240 m. Near village Asoda, three marble area of each 4 ha were delineated for auction.
Sandstone							
Jaisalmer	N/v Sattasar, Tehsil Pokaran	1:10000 1:2000	10.0 1.0	6	400.00	64	Objective of exploration was to locate & delineat the area of sandstone which is sutiable for dimensional stone or masonary stone.The area comprised maroon to reddish brownish coloured sandstone suitable for masonary stone.
Granite							
Rajsamand	N/V Anoppura Jemakhera, Hirakheda, etc. Deogarh-Tehsil.	1:10000 1:4000	205.0 1.0	-	-	-	Granite is gneissic in nature and grayish black in colour, medium to coarse grained, compact & hard. 32 plots of granite were delineated.
Clay, Red Ochre and other economic minerals							
Chittorgarh	Pavli, Baru, Karithra, Muroli, Rud, Bamina, Tehsil Rashmi	1:50000 1:10000	100.0 12.0	-	-	11	Two bands of banded haematite quartzite have been noticed. First band observed from south of Karithra to north of Pavli for about 5.7 km in length and width varying up to 200 m. Chemical result of spot samples shows Fe_2O_3 content varying from 42.03% to 48.28%, Al_2O_3 from 1.70% to 2.95%, Co from 27.4 to 89 ppm, Mn from 40 ppm to 0.05%. Other band observed near south of Baru village for about 400-500 m in length and width up to 200 m. Chemical result shows Fe_2O_3 38.69%, Al_2O_3 4.95%, Mn 2.28%, Co 154 ppm, SiO_2+A.I 19.58%, Fe 27% & L.O.I 16.54%.
Clay, Ochre, iron, granite, etc.							
Bhilwara	N/V Chandgarh, Raghunathpura, and Jeeva ka Khera, etc. Tehsil-Kotri	1:50000 1:10000 1:4000	250.0 35.0 3.75	6	287.0	13	Reserves/Resources were not calculated due to poor core recovery and the prospective results were not encouraging.
Quartz, feldspar and other economic minerals							
Bhilwara	Tiloli, Devthari, Amdala, Jhalriya, etc.	1:50000 1:1000 1:4000	400.0 10.0 1.0	-	-	15	Reserves/Resources were not calculated.
	Bhunas, Mahendra-garh, Shivartiya, etc.	1:10000 1:4000	20.0 1.0				

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Table – 3(A) (Concld)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Neyveli Lignite Company India Ltd							
Coal							
Nagaur Churu	Kheduli, Matasuk-Lunsaraa and Pyau south block	-	-	53	13518.30	75	Promotional exploration funded by Ministry of Coal was taken up in Kheduli, Matasukh-Lunsara and Pyau south blocks. In Kheduli block, 53 boreholes were drilled to a total depth of 13518.30 m and collected 75 samples for chemical analysis. The block is promising. The exploration results of other two blocks i.e. Matasukh-Lunsara block, Nagaur district drilled and Pyau south block, Churu district are not promising blocks. The exploration in these two blocks were completed.
HZL							
Lead & Zinc (Galena & Sphalerite)							
	Mochia	1:200	2535.00	355	22951.00	9785	About 43.80 million tonnes total resources were estimated, out of which 1.08 million tonnes, were estimated under proved category.
	Balaria	1:200	1280.00	344	22324.35	5147	About 32.57 million tonnes total resources were estimated, out of which 0.46 million tonnes, were estimated under proved category.
	Zawarmala	1:200	421.00	70	7295.00	5107	About 6.60 million tonnes total resources were estimated, out of which 0.49 million tonnes, were estimated under proved category.
	Baroi	1:200	4032.00	460 1229	31041.0 83611.35	13905 33944	About 21.20 million tonnes total resources were estimated.
	Bara	-	-	-	-	-	About 1.67 million tonnes total resources were estimated, out of which 1.63 million tonnes, were estimated under proved category. Lead & Zinc mineralisation has been occured in strati form as well as strata bound in nature. At most places ore bodies indicate differential mobilisation/remobilisation. Mineralisation occurs as veins, small pockets and also as dissiminations. During 2017-18 HZL carried out about 83611.35 m drilling in 1,229 boreholes & total 133944 samplings were drawn during the year. Total ore reserves/ resources stand at about 105.83 million tonnes covering all the 5 mines with 4.77 million tonnes of zinc metal, 2.42 million tonnes of lead metal & 147 thousand tonnes of silver metal. The average content of zinc is about 4.51%, lead 2.29% and silver is 43 gram/t.

Table – 3(B) : Details of Exploration Activities in Rajasthan, 2016-17

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
DGM							
Lignite							
Bikaner	n/v (Near village) Diyatra tehsil Kolayat	1:50000	-	11	1976.40	13	During 2016-17, exploration for lignite was continued n/v Diyatra, tehsil Kolayat, Bikaner district. Eleven boreholes were drilled to a cumulative depth of 1976.40 m and estimated 0.36 million tonnes of lignite resources and 17.14 million tonnes of lignite shale resources. Total resources of lignite and carb clay (lignitic shale) on 1:50000 scale and collected 13 nos of samples. In Bikaner district, regional mineral survey near villages Nathwato ki Dhani, Sewra, Nagarasar, Bera ki Dhani in Kolayat tehsil was taken up with an objective to explore new lignite deposits in border region of Bikaner, Jaisalmer and Jodhpur districts. No indication of lignite was found during tubewell sludge study.
Base Metal & Noble Metal							
Bharatpur	n/v Jotri Peepal	1:50000	50.5	-	-	-	During 2016-17, investigation for locating base metal and noble metal was taken up
	Piruka Teski	1:10000	15.0	-	-	-	
	in Pahari tehsil	1:4000	2.0	-	-	-	n/v Jotri Peepal, Piruka Teski in Pahari tehsil, Bharatpur district, Rajasthan. An area of 50.0 sq km was mapped on 1:50000 scale, 15.0 sq km on 1:10000 scale and 2.0 sq km on 1:4000 scale. Lead mineralisation is confined to the western intercalated quartzite and phyllite contact in the Khola Piruka in old pit admeasuring 40 m x 3 m x 2 m area and in the Gol Pahari area mineralisation is exposed to the surface of quartzite in old pits in the form of disseminated galena specks. Exploration will continue.
Iron ore							
Jaipur	n/v (Near village) Morija Tehsil Chomu	1:50000 1:10000 1:4000	100 20 2.1	-	-	28	Earlier during 2016-17, exploration to prove iron ore reserves was taken up near village Morija, Tehsil Chomu, Jaipur district, Rajasthan. During exploration work, iron ore bands and open pit of iron have been marked. The area covering 100 sq km was mapped on 1:50000, 20.00 sq km on 1:10000 scale and 2.10 sq km on 1:4000 scale and collected 28 nos of samples for chemical analysis. Besides, 30 L km covered in geophysical survey.
Iron ore & Clay							
Jaipur	Siyar, Dalesing Ka Kheda Kalundiya &Arjankheri	1:10000 1:4000	15 1.5	4	201	27	Exploration for iron and clay was continued from field session 2015-16 near village Siyar, Dalesing Ka Kheda, Kalundiya and Arjankheri. An area of 15.0 sq km was mapped on 1:10000 scale and 4 boreholes were drilled for a total depth of 201.0 m. An area of 1.5 sq km on 1:4000 scale was mapped around

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Table – 3 (B) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							villages Bhakliya-Chandgarh-Adsipura-Rebbariyo ki Dhani-Jeewakhera-Downi. Total 27 samples were analysed for iron and clay. Drilling is continuing.
Iron ore							
Karauli	n/v Karwari to Rara Shahur Kalyanpur Sayata, Jatwara in Hindaun tehsil	1:10000 1:4000	10 1.0	-	-	12	Exploration to locate iron ore body was taken up n/v Karwari to Rara Shahur, Kalyanpur Sayata, Jatwara in Hindaun tehsil, Regional mineral survey of 125.0 sq km area was carried out together with mapping of 10.0 sq km on 1:10000 scale and 1.0 sq km area on 1:4000 scale. The iron ore occur in the form of thin banding with intercalated quartzite. Total 12 samples for chemical analysis were collected. Resources were not estimated as depth persistence of brecciated ferruginous quartzite is not clearly known.
REE							
Sindhari Tehsil	Sevron Kin Dhani and Sodha Kin Dhani area	1:50000	120	-	-	18	During 2016-17, regional mineral survey in Bambdi Nadi area near village Sevron Kin Dhani and Sodha Kin Dhani area, Rajasthan was taken up with an objective to search for Rare Earth Elements. An area of 120 sq km was covered on 1:50000 scale and 18 nos of samples were collected during survey. Two carbonatite dykes are observed in and around Bambdi Nadi, Sevron Kin Dhani. One carbonatite dyke is exposed up to 30 m in length and 1.0 to 2.0 m in width. Second carbonatite dyke is 42.0 m in length and 2.70 m in width. Three carbonatite samples have indicated REE values near Bambdi, Sodha Ki Dhani in Sindhari tehsil. The REE value ranging from 0.02% to 0.05%. Yttrium ranges from 27.69 to 51.10. The area seems to be anomalous zone having high values of REE.
Limestone							
Ajmer	Around Mehgaon Nituti, Gingoli Jajota, Jhak, etc village, Border area of Ajmer & Nagour	1:50000 1:10000 1:2000	150 15 3	-	-	26	An exploration of around 200 sq km area was taken up with an objective to locate limestone, dolomite, flourite, baryte, soapstone, white quartzite and other economic minerals. Ferruginous gossanised zone was observed in silicified quartizite/amphibolites, calc silicate n/v Mahegaon in the south to village Gingoli in north over a strike length of 11 km with width of 4.5 km. Specks of pyrite, chalcopyrite and pyrrhotite have been observed in quartzite, amphibolite and calc silicate.

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Table – 3 (B) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
	N/v Shyamgarh Pakriyawas, Kanakheda, Kesarpura, etc. Tehisl Beawar	1:10000 1:2000	10.0 4.0	4 -	600 -	557 -	During exploration of area, three bands in impure limestone admeasuring about 4500x200-350 m, 800x8-13 m, 635x19-28 m were mapped n/v Kotra-Ka-Bariya-Banola, Shivpura-ghata, Gowaliya and Dhandhiya, etc. Similarly five bands of limestone measuring about 1000x30-85 m, 110x10-23 m, 620x12-42 m, 1270x110-400 m and 1910x300-840 m were mapped n/v Kanakhera, Khetakhera and Kasarpur. Limestone in the area is fine to medium grained, hard, compact, fractured, jointed and weathered at surface.
Tonk	N/v Khalilpura Dodwari, Devri Jabriya etc. Tehsil-Tonk	1:50000 1:10000 1:2000	50.0 10.0 4.0	12	600.0	219	A search for cement grade limestone was taken up in the area. Two limestone bands were mapped around Devri and Kurera. The first band is about 500 m north of village Devri extends for a strike length of 700 m with 45-50 m. width. The second band is about 350 m east of village Devri and extend to a strike length of 500 m with width of about 8-10 m. The limestone is grayish-white to greenish gray in colour, medium grained and crystalline in nature.
Alwar/ Jaipur	N/v Bithoda Mandha, Bhankri, Karoi, Nayabas,etc Tehsil-Kotputali Jaipur distt and Tehsil-Thanagazi Alwar-distt	1:4000	2.10	4	269	53	Total reasources were estimated at about 50.17 millon tonnes.
Jhunjhunu/ Sikar	N/v Parasrampura Gothra area, etc. Tehsil-Nawalgarh, Jhunjhunu distt.	1:4000	3.0	-	-	26	Further exploration by outsourcing or under NMET fund is proposed.
Udaipur	N/v Bikarni-Kagwas-Sandmaria, Tehsil-Kotra	1:50000 1:10000 1:4000	100.0 10.0 1.0	-	-	10	N/v kyara and Bikarni, medium grained limestone, at places siliceous in nature are continued in southern side extended for 500 m and 1700 m in length with witdth varies form 50-300 m. Total length of limestone is 4 to 4.5 km including extension of old explored band. Limestone is intruded by small pegmatite vein.
Dungarpur	Rama, Dad, Padla-jani, Nandli Ahara, Bhatoli, Munger, Sabla,Tehsil-Aspur	1:4000	2.0	4	596	338	The exploration in this area was commenced in 2014-15. The light pinkish grey to grayish white coloured fine to medium grained, hard and compact intermittently exposed crystalline limestone band was geologically mapped in detail n/v Bhatoli. Limestone band is exposed over a length of about 3 km with varied width

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Table – 3 (B) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Bhilwara	Phul ji ki Kheri-Sopura- Shyamgarh-Amartiya-Bharnda-Ratiya Kheda-Dhakad Kheri Shamgarh-Phul ji ki Khera-Amartiya-Chitauriya-Bharenda	1:10000 1:4000	20.0 2.75	-	-	-	of 10m to 15m from North East to South West of village Bhatoli. Limestone band mapped in the area extends for a strike length of about 7 km with width varying from 2 km to 2.4 km. The project will continue in FS 2017-18.
Pali	N/v Virampura, Ki Bhagal, Tehsil-Bali	1:50000 1:10000 1:4000	300.0 20.0 2.0	-	-	37	Two limestone band have been mapped in the area i.e. one band extends for about 1700 m with width varying from 150 m to 500 m and other limestone band extends for a strike length of 1500 m with width varying from 200 m to 500 m.
Jaisalmer	N/v Kamal ka, Goal of Sam area tehsil	1:10000 1:2000	15.0 4.0	26	1217.0	800	Resources estimated at 355.0 million tonnes of cement grade limestone and 65.0 millon tonnes of SMS grade limestone.
Limestone, Masonary stone, Bajri and other economic minerals							
Bikanar	N/V Soniyasar, Kumpalsar, Dhaneru, Badela, etc., Dungargarh Tehsil	1:50000 1:10000	250.0 10.0	-	-	-	The area is occupied with sand and medium to high sand dunes. Project discontinued due to non-encountering of promising limestone.
Limestone							
Bikanar	Sarunda, Bhadla and Sobhana village of Nokha Tehsil	1:10000	15.0	-	-	-	The area is concealed and no esposures of limestone were found on surface. The project was not considered for next field season.
Alwar	N/v Dangarwara, Dhamrer,Thonsra, Digaora,Toda Gyan Singh, Chhillori, etc Tehsil-Rajgarh	1:50000 1:10000 1:4000	150.0 10.0 3.0	-	-	15	Limestone and ferruginous quartzite were reported in the area. Limestone found n/v Fatehpura, Simbhu Ka Bas, Patan, Andhwadi, etc. Ferrugious brecciated quartzite is associated with limestone. The CaO is less than 33% and iron is up to 44% in brecciated ferruginous quartzites n/v Kharkhari Chawand Singh, tehsil Reni.
Nagaur	N/v Taras & Khorwa, Tehsil Khinwsar	-	-	26	1000.0	698	In the block (No.4) area drilling was carried out on 800 m x 800 m and 1600 m x 1600 m grid pattern and established the occurrence and depth persistence of limestone. Resources estimated at 516.656 million

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Table – 3 (B) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Sawai Madhopur	N/v Padra, Aniyala, Barod Tehsil-Khandar	1:50000 1:10000 1:4000	125.0 10.0 2.0	-	-	36	tonnes of cement grade limestone. The limestone was seen along chambal river in 4000 m x 500-1200 m area n/v Padra-Aniyala and 1200 m x 200-250 m area n/v Barod. The limestone appeared to be of cement grade. Resources were not estimated due to lack of data on depth persistence of limestone. The project will continue.
Chittorgarh	Rasulpura, Bansa & Pirkhera, Phachar Ahiran, Tehsil-Nimbahera	-	-	4	209.0	119	Exploration was started in 2014-15 with an objective to locate cement grade limestone deposit in the area. About 119 m cummulative thickness of grey limestone with thin shale intersection were reported in all boreholes. Cement/ blendable grade limestone exist in the area. Resources will be estimated after the receipt of chemical analysis data.
	Samriya kalan, Nathuramji ka Khera, Meghniwas and Mandna Tehsil-Begun	1:10000 1:4000	17.50 2.0	-	-	22	The limestone band mapped in the area having strike length of about 8.5 km with width of more than 2.0 km. It is massive, non crystalline, compact and fine grained with greyesh colour and varigated in upper part and purplish-pink and argillaceous in lower part. Limestone seems to be of cement grade. The project will continue.
Sirohi	Tehsil-Aburoad Pindwara	1:10000 1:4000	10.0 2.25	4	222.0	64	i) A limestone band near village Nitaura was mapped for a strike length of about 220 m with exposed width up to 50-80. The limestone seems to be cement grade; ii) A limestone band extend for the strike length of more than 5.5 km with exposed width of 500 m-700 m was seen from village or to north of Derna; iii) A limestone band extend for the strike length of more than 1.0 km with exposed width of 30 m - 200 m was mapped around Naijamin village; iv) Jharoli-Laj-Phulera-Nitaura limestone band is intermittently extends for strike length of more than 25 km with exposed width up to 300.0 m. The detailed chemical analysis results of Derna Wada area shows average CaO content of limestone is 50.26% with about 4% SiO_2 & MgO and about 1% to less than 1% Fe_2O3. The limestone band around Derna to south of Wara village is cement grade to high grade.
Nagaur	N/v Awad and Khera, Tehsil-Jayal	-	-	26	1000.0	739	The boreholes drilled in the area intersected limestone for a cumulative thickness of 0.50 m to 24.85 m. The limestone of the area is of good quality high grade limestone. Resources estimated in the area are placed at 371.696 million tonnes of cement grade limestone. Exploratory drilling will continue.

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Table – 3 (B) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Limestone, Clay, Silica Sand, etc							
Bundi	N/vKathoda, Mani, Bishan Pura, Sodanpura,Kalyani, Karwar, Antarda, etc Tehsil-Nainwa	1:50000 1:10000 1:4000	150.0 15.0 1.5	-	-	-	-
Laterite, Clay, Red ochre, Glauconitic shale, etc.							
Baran	N/v Bhanpur Pureni, Semri, Baseri, Amrod, Majola, Thana Kasba, Tehsil-Shahbad	1:50000 1:10000 1:4000	150.0 15.0 1.5	-	-	-	-
Laterite, high grade Limestone, Bentonite, Clays, Ochre, etc							
Jhalawar	Deccan Trap areas of tehsil Jhlrapatan, Pirawa, Pach-Pahar, Gangdhar, Aklera, Manoharthana and Khanpur.	1:50000 1:10000 1:4000	150.0 15.0 1.5	-	-	-	-
Decorative and Masonary Stone							
Udaipur	N/v Lunk, Tehsil-Kotra	1:50000 1:10000 1:4000	100.0 10.0 1.0	-	-	-	N/v Lunk medium to coarse grained, hard and compact, greenish grey to grey coloured Erinpura granite is exposed and porphyritic in nature seems to bear good blockablity in boulders, knobs and sheets.
Minor Minerals and other economic minerals							
Dungarpur	N/v Ganeshpur, Tehsil-Aspur, Ghughra & Inder Khet(Rampur) Tehsil-Dungarpur	1:50000 1:10000 1:4000	200.0 10.0 2.5	-	-	6	An area of 2.0 sq km was covered under detailed mapping in three blocks namely a) Ganeshpur block, b) Gughra block and c) Inderkhet block. In Ganeshpur block, in an area of 1.0 sq km, the light yellow coloured, fine to medium grained, hard and compact quartzite with fractures, etc is exposed for about 1100 m in length and 150 m to 300 m of average width. In Gughra block, light yellowish coloured fine to medium grained, hard quartzite is exposed over an area of 1.0 sq km. The quartzite may be useful for building contruction purpose. In Inderkhet block, light yellowish to brownish coloured, medium grained, hard quartzite is exposed over an area of 0.50 sq km. No new mineral found. Project completed.
Granite							
Jalore	N/v Nosara, and Nosra ki dhani Tehsil-Ahore	1:4000	2.0	-	-	11	Outcrop of granite having dimension of 500x100m n/v Nosara and 250x150 m n/v Nosra Ki Dhani were mapped. Granite is brownish to creamish in colour, medium to coarse grained and blockable in nature.
Sand stone (Building stone and masonary)							
Jodhpur	N/v Kumaro, ki dhani and Joganion ka Bhakar, Tehsil-Balesar	1:50000 1:10000 1:4000	130.0 10.0 2.0	-	-	35	Isolated outcrops of sand stone were mapped to north of village Kumaro Ki Dhani in 600 m x 800 m area. Massive and jointed sandstone is exposed n/v

(Contd.)

Table – 3 (B) (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage	(No.)	Reserves/Resources estimated
							Joganion Ka Bhakar (3 km x 2 km), Devatu (122m x 119m and 146m x 107m) and Raikon Ki Dhani (1000 m x 750 m), etc. It is creamish to pink coloured, medium to coarse grained, bedded and compact sandstone and can be used as building/masonary stone.
Silica Sand							
Jaisalmer	N/v Neran, Nehari Talai etc Tehsil-Pokaran	1:50000 1:10000 1:2000	100.0 10.0 2.0	-	-	12	About 1.0 sq km area have been identified for white friable sand stone of 1 m to 2 m exposed thickness. Few chemical analysis showed SiO_2 content varies from 85.72% to 92.70% and Fe_2O_3 content varies from 0.42% to 1.06%.
Rhyolite							
Jaisalmer	N/v Lawan, Tehsil-Pokaran	1:50000 1:10000 1:2000	100.0 10.0 1.0	-	-	19	About 0.50 sq km pontential area of brownish coloured rhyolite was mapped in this area. At depth rhyolite is hard and compact and suitable for stone grit.
Slate Stone							
Alwar	N/v Mandhan, Anandpur, Khundroth, Shivdansingh pura,etc. Tehsil-Behror	1:50000 1:10000 1:4000	150.0 10.0 3.0	-	-	20	-
Sand stone							
Dholpur	N/v Bhiramad, Pipret, Padampura, Dangripura, Jorgarhi, Kacchpura, Kankret, Rajpura, Rahrai,etc. Tehsil-Basedi	1:50000 1:10000 1:4000	100.0 10.0 1.0	-	-	-	Total resources estimated at 22.20 million tonnes of splittable sand stone n/v Bhiramad, Chandpura, Teja Ka Pura & Dadraunipura, Tehsil-Sarmathura.
Silica Sand, Clay, Quartz							
Bharatpur	N/v Sita, Lakhanpura, Bhagora, Kharairi, Sonpur, Madpur, Bijepura, Dhurairi, etc. Tehsil-Bayana	1:50000 1:10000 1:4000	100.0 10.0 1.0	-	-	-	Copper staining have been noticed in old working n/v Kair and Khankheda. Project continues.
Masonary stone							
Sirohi	Tehsil-Aburoad	1:10000 1:4000	5.0 1.0	-	-	-	-
Granite/Rhyolite							
Sirohi	N/v Mungeria	1:50000 1:10000 1:4000	200.0 10.0 2.0	-	-	-	Granite exposure were located to about 2 km towards N-NNE of Mungeria village. Outcrops of rhyolite are exposed to the south of village Mungeria in 300 m x 200 m area.
Siliceous earth, Sand Stone							
Barmer	N/v Mandai	1:50000 1:10000 1:4000	200.0 10.0 2.0	-	-	-	The siliceous earth is exposed at three localities i.e. i) Towards NE direction and 560 m from Mandai Nadi, ii) towards NE direction and 990 m from Mandai Nadi and iii) towards NE direction and 1600 m from Mandai Nadi. The above pits location covers length of 1100 m. The siliceous earth is concealed under sand & alluvium and hence continuity could not be confirmed. Sandstone of Devka, Rajral area is suitable for mansonry stone.

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Table – 3 (B) (Concld)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Clay, Red ochre, Silica sand							
Chittorgarh	Bhadesar, Hatipura, Sand, Palri, Pagara,etc. Tehsil-Bhadesar	1:50000 1:10000 1:4000	200.0 11.50 1.0	-	-	33	The regional mineral survey of the area revealed i) the ferruginous cherty brecciated quartzite (hosting red ochre and china clay) intermittently exposed for about 18 km in length and 200 m to 500 m in width from north of Hattipur Minana in south. The silica sand band was observed n/v Tejpura/Tejpura Ki Dhani; ii) another band was exposed intermittently for about 12.50 km in length with width of 200 m to 2.50 km from north of Japharkheda to Sand in south. Apart from this, silica sand band having dimension 70 m x 10-15 m was also seen at the foot hills n/v Sand, Shergarh area; iii) A laterite bed was noted in the west of Palri village to Sand. Prospecting work completed.
Granite							
Jalore	N/v Panchota, and Tarwara, Tehsil-Ahore.	1:4000	2.00	-	-	11	-
Barmer and Jaisalmer	N/v Ranakdev, Mehrari area	1:50000 1:10000 1:4000	150.00 10.0 2.00	-	-	-	-
Barmer	N/v Gujron Ka Talla (Chuli Dungri)	1:50000 1:10000 1:4000	150.00 10.00 1.00	-	-	07	-
Phyllite, Limestone, Clay, Silica sand, etc.							
Bundi	Chainpuriya, Bheemganj, Tarkia, Deroli, Narayanpura, Tonkra, etc. Tehsil Hindoli.	1:50000	100.0	-	-	-	-
Quartz, feldspar and Granite							
Sirohi	Tehsil Shivganj	1:10000 1:4000	10.0 1.00	-	-	01	-

Table – 4 : Mineral Production in Rajasthan, 2015-16 to 2017-18 (Excluding Atomic Minerals)

(Value in ` '000)

Mineral	Unit	2015-16			2016-17			2017-18 (P)		
		No. of mines	Qty	Value$	No. of mines	Qty	Value$	No. of mines	Qty	Value$
All Minerals		**87**		**180582142**	**87**		**195210862**	**81**		**208869737**
Lignite	'000 t	-	9492	-	-	8480	-	-	9294	-
Natural Gas (ut.)	m c m	-	1338	-	-	1277	-	-	1442	-
Petroleum(crude)	'000 t	-	8602	-	-	8164	-	-	7887	-
Copper Ore	t	-	1103992	-	-	1117241	-	-	1161111	-
Copper Conc.	t	2	63982	2946547	2	56798	3045512	2	61312	4047407
Iron Ore	'000 t	14	1146	1768585	14	1228	3107923	12	1317	3646154
Lead & Zinc Ore	t	-	10453038	-	-	11881236	-	-	12613866	-
Lead Conc.	t	8	261857	7885122	8	268047	9669267	8	306399	11429378
Zinc Conc.	t	*	1473811	34943088	*	1484244	43385599	*	1539655	49799283
Manganese Ore	t	1	3457	10350	1	2545	7635	1	7497	22307
Silver**	kg	-	426321	15208326	-	460642	18314119	-	557518	21172433
Phosphorite	t	2	1505603	3708221	2	974740	2867678	2	1420966	3672664
Garnet (abrasive)	t	3	958	1744	2	1482	2567	2	5781	19084
Limestone	'000 t	36	67336	15253871	35	66906	15908982	34	74036	16197297
Selenite	t	3	3103	6206	3	4328	8656	4	469	939
Siliceous Earth	t	13	47386	20735	16	77270	55340	12	58875	57457
Vermiculite	t	-	421	400	-	127	127	-	-	-
Wollastonite	t	5	175348	150313	4	166186	158823	4	153049	126700
Minor Minerals@		-	-	98678634	-	-	98678634	-	-	98678634

Note: *The number of mines excludes Natural Gas (utilised), Petroleum (crude), Fuel Minerals and Minor Minerals.*

$ Excludes the value of Petroleum (crude) & Natural Gas (utilised); and Fuel Minerals.

** Number of mines covered under lead concentrates.*

*** Recovered at Chanderiya Lead-Zinc Smelter of HZL from lead concentrates produced in Rajasthan.*

@ 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 mineral-based industries in the organised sector in the State are given in Table - 5.

Table – 5 : Principal Mineral-based Industries in Rajasthan

Industry/plant	Capacity ('000 tpy)
Cement	
ACC Ltd, Lakheri, Distt Bundi.	1500
Ambuja Cements Ltd, Rabriyawas, Distt Pali.	1800
Binani Cement, Binanipuram, Distt Sirohi.	4850
Binani Cement, Neem Ka Thana, Sikar (G).	1400
Birla Corporation Ltd (Birla Cement Works & Chanderia Cement Works), Chittorgarh.	3500
J.K.Cement, Nimbahera, Distt Chittorgarh.	3300
J.K.Cement, Mangrol, Distt Chittorgarh.	1000
J.K.Cement, Gotan, Distt Nagaur.	470
J.K. White Cement Works, Gotan, Distt Nagaur.	410
J.K.Laxmi Cement, Banas, Distt Sirohi.	4200
Lafarge India Ltd, Nimbahera, Distt Chittorgarh.	1970
Mangalam Cement (Mangalam Cement & Neer Shree Cement), Morak, Distt Kota.	3250
Shree Cement Ltd, Beawar, Distt Ajmer.	3800
Shree Cement Ltd, Ras, Distt Pali.	4000
Shree Cement Ltd, Ras (New Unit), Distt Pali.	2000
Shree Cement Ltd, Kushkhera, Distt Alwar (G).	4000
Shree Cement Ltd, Suratgarh, Distt Sri Ganganagar (G).	2000
Shree Cement Ltd, Jobner, Distt Jaipur (G).	2000
Shriram Cement Works, Kota.	400
Trinetra Cement (Subsidiary of India Cement), Nokhala, Distt Banswara.	1500
Udaipur Cement Works (Subsidiary of JKCL), (Udyog Ltd), Udaipur.	600
Ultra Tech Cement (Birla White Cement Division), Kharia Khangar, Distt Jodhpur.	560 (white cement)
Ultra Tech Cement (Aditya I & II), Shambhupura, Distt Chittorgarh.	5000
Ultra Tech Cement, Kotputali, Distt Jaipur.	3100
Wonder Cement, Nimbahera, Distt Chittorgarh.	3300
Chemical	
DCM Shriram Industries Ltd, Kota.	9 (rayon/yarn) 7.7 (sodium sulphate)
Modi Alkalies & Chemicals Ltd, Alwar.	84.2 (caustic soda) 50.3 (Cl), 39.6 (HCl)
Ceramics/Chemicals	
Bikaner Ceramics Pvt. Ltd, Bikaner.	9 (insulators)
Kajaria Ceramics Ltd, Gailpur.	6.5 (mill. sq m)
Kajaria Ceramics Ltd, Malootana.	24.5 (mill. sq m)
Bhalla Chemical Works Pvt Ltd Bhiwandi.	10 (zirconium Oxychloride & special Zirconia)
Roca Bathroom Product Pvt Ltd, Alwar.	12.9
Roca Bathroom Product Pvt Ltd, Alwar.	2 mill. pc.
Fertilizer	
Adheeshaa Phosphate, Umarada, Udaipur.	132 (SSP)
Arawali Phosphate Ltd, Umra, Udaipur.	40 (SSP)
Arihant Phosphate & Fertlizers Ltd, Nimbaheda, Chittorgarh.	66 (SSP)
Bohra Industries Ltd, Umra, Udaipur.	200 (SSP)
Chambal Fertilizers & Chemicals Ltd, Gadepan, Kota.	180 (SSP)
Chambal Fertilizer & Chemical Ltd, Gadepan (Unit I & II), Distt Kota.	2013 (Urea)
Coromandel International Ltd (Formerly Liberty Phosphate Ltd), Madri, Udaipur.	264 (SSP)
Coromandel International Ltd (Formerly Liberty Phosphate Ltd), Jagpura, Kota.	132 (SSP)
Devyani Phosphate Pvt. Ltd, Udaipur.	60 (SSP)
Dharamsi Morarji Chemical Co. Ltd, Khemli, Udaipur.	66 (SSP)

(Contd.)

(Contd.)

Table - 5 (Contd.)

Industry/plant	Capacity ('000 tpy)
Gayatri Spinners Ltd, Hamirgarh, Bhilwara.	30 (SSP)
Indian Phosphate Ltd, Umrada, Udaipur	130 (SSP)
Jagdamba Phosphate, Kota.	132 (SSP)
Jubilant Agri and Consumer Products Ltd, Singhpur, Kapasan, Chittorgarh.	264 (SSP)
Khaitan Chemical & Fertilizers Ltd, Dhinwa, Distt Chittorgarh.	198 (SSP)
Mangalam Phosphates Ltd, Hamirgarh, Bhilwara.	72 (SSP)
Ostwal Phoschem (India) Ltd, Hamirgarh, Bhilwara.	132 (SSP)
Patel Phoschem (P) Ltd, Umarda, Udaipur.	100 (SSP)
Prem Sakhi Fertx. Ltd, Lakadwas, Udaipur.	66 (SSP)
Rama Phosphates Ltd, Umra, Udaipur.	181 (SSP)
Sadhana Phosphates & Chems Ltd, Gudli, Udaipur.	120 (SSP)
Shriram Fertilizers & Chemicals Ltd, Shriramnagar, Distt Kota.	379.5 (Urea) 113.8 (caustic soda) 13.2 (bleaching powder) 61.2 (HCl) 61.2 (Cl)
Shri Ganapati Fertilizers Ltd, Kapasan, Chittorgarh.	99 (SSP)
Shurvi Colour Chem Ltd, Madri, Udaipur	12 (SSP)
Plaster of Paris	
Abhishek Plaster Industries, Baramsar, Distt Hanumangarh.	6.1
Agrawal Industries, Nohar, Distt Hanumangarh.	6.3
Balaji Plaster Industries, Taranagar, Distt Churu.	6
Balaji Industries, Taranagar, Distt Churu.	6.5
Ganesh Plaster Industries, Taranagar, Distt Churu.	6
Gil Brothers, Taranagar, Distt Churu.	7.1
Hind Plaster Industries, Taranagar, Distt Churu.	6

(Contd.)

Table - 5 (Concld.)

Industry/plant	Capacity ('000 tpy)
Jaishri Plaster Industries, Taranagar, Distt Churu.	6.3
Jagdamba Plaster Industries, Rawatsav, Distt Hanumangarh.	7
Jai Bhavani Plaster Industries, Baramsar, Distt Hanumangarh.	6
Jai Sriram Plaster Industries, Taranagar, Distt Churu.	7.1
M.G. Plaster Pvt Ltd, Taranagar, Distt Churu.	6.2
Mahabir Plaster Industries, Taranagar, Distt Churu.	6
Multani Industries, Nohar, Distt Hanumangarh.	8.4
R.D. Plaster Industries, Nohar, Distt Hanumangarh.	8.4
R.N.Industries, Bikaner, Distt Bikaner.	18
Shalimar Plaster & Chemical Industries, Sardarshahar, Distt Churu.	14
Shri Lakshmi Gypsum, Chak, Distt Hanumangarh.	6
Shriram Plaster, Taranagar, Distt Churu.	6.3
SS Plaster Industries, Taranagar, Distt Churu.	6
Shiv Bhakti Industries, Nohar, Distt Hanumangarh.	8.4
Tiger Plaster, Sardarshahar, Distt Churu.	11
The Sardarshahar Plaster & Minerals, Sardarshahar, Distt Churu.	19.4
Updesh Industries Ltd, Chak, Distt Hanumangarh.	9
Copper Smelters	
HCL, KCC, Jhunjhunu.	31 (Cu cathode)
Lead & Zinc Smelters	
HZL Zinc Smelter, Debari, Distt Udaipur.	88 (Zn)
HZL Lead-zinc Smelter, Chanderiya, Distt Chittorgarh.	85 (Pb) 525 (Zn) 0.833 (Cd)* 168 tonnes (Ag)
HZL, Dariba Smelting Complex, Dariba Distt Rajsamand.	100 (Pb) 210 (Zn)

** Total for all smelters of HZL.*
(G); Grinding Units
Note: *Data, not readily available for fertilizer and cement industries on respective websites, is taken from Indian Fertilizer Scenario/FAI Statistics, and Survey of Cement Industry & Directory, respectively.*