Indian Minerals Yearbook 2019

(Part- I)

58th Edition

STATE REVIEWS (Gujarat)

(ADVANCE RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

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GUJARAT

Mineral Resources

Gujarat is the sole producer of chalk and is the principal producer of clay (others), fluorite (graded), kaolin, silica sand, lignite, petroleum & natural gas and marl in the country. The State is the sole holder of the country's chalk, marl and perlite resources and possesses 66% fluorite, 28% diatomite, 25% bentonite, 18% granite, 12% wollastonite, 10% limestone and 9% bauxite resources.

The important mineral occurrences in the State are: **bauxite** in Amreli, Bhavnagar, Jamnagar, Junagadh, Kheda, Kachchh, Porbandar, Sabarkantha & Valsad districts; **ball clay** in Banaskantha, Bharuch, Kachchh & Patan districts; **bentonite** in Amreli, Bhavnagar, Jamnagar, Kachchh & Sabarkantha districts; **china clay** in Amreli, Banaskantha, Bhavnagar, Jamnagar, Junagadh, Kachchh, Mahesana & Sabarkantha districts; **chalk** in Porbandar district; **diatomite** in Bhavnagar district; **dolomite** in Bhavnagar & Vadodara districts; **fireclay** in Bharuch, Kachchh, Mehsana, Rajkot, Sabarkantha, Surat & Surendranagar districts; **fluorite** in Vadodara & Bharuch districts; **gypsum** in Bhavnagar, Jamnagar, Junagadh, Kachchh and Surendranagar districts; **lignite** in Bharuch, Bhavnagar, Kachchh & Surat districts; **limestone** in Amreli, Banaskantha, Bharuch, Bhavnagar, Jamnagar, Junagadh, Kheda, Kachchh, Panchmahals, Porbandar, Rajkot, Sabarkantha, Surat, Vadodara & Valsad districts; **marl** in Amreli, Junagadh & Porbandar district; **ochre** in Banaskantha, Bhavnagar & Kachchh districts; **perlite** in Rajkot district; **petroleum and natural gas** in oil fields of Ankaleshwar, Kalol, Navgam, Balol & Cambay in Cambay onshore and offshore basins; **quartz/silica sand** in Bharuch, Bhavnagar, Dahod, Kheda, Kachchh, Panchmahals, Rajkot, Sabarkantha, Surat, Surendranagar, Vadodara & Valsad districts; and **talc/soapstone/steatite** in Sabarkantha district.

Other minerals that occur in the State are: **apatite** and **rock phosphate** in Panchmahals district; **calcite** in Amreli & Bharuch districts; **copper ore** in Banaskantha district; **granite** in Banaskantha, Mahesana & Sabarkantha districts; **graphite** in Panchmahals district; **lead-zinc** and **marble** in Banaskantha & Vadodara districts; **manganese ore** in Panchmahals & Vadodara districts; **vermiculite** in Vadodara district; and **wollastonite** in Banaskantha district. The lignite resources are located in Bharuch, Bhavnagar, Kachchh and Surat districts (Tables - 1 and 2).

Exploration & Development

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

Production

Lignite, natural gas (utilised), petroleum (crude), bauxite, limestone etc were reported from Gujarat. The value of minor mineral's production is estimated as ₹6,750 crores for the year 2018-19. There was 185 reporting mines in 2018-19 in case of MCDR minerals (Table-4).

Mineral-based Industry

The present status of each mineral-based industry is not readily available. However, the important mineral-based industries in the Organised Sector in the State are furnished in Table - 5.

Table – 2: Reserves/Resources of Lignite as on 1.4.2019: Gujarat

(In million tonnes)

District	Proved	Indicated	Inferred	Total
Total	**1278.65**	**283.70**	**1159.70**	**2722.05**
Kachchh	335.61	56.40	33.09	425.10
Bharuch	724.76	118.59	491.23	1334.58
Bhavnagar	–	–	299.17	299.17
Surat	218.28	108.71	336.21	663.20

Source: *Indian Coal & Lignite Resources-2019, Natural Energy Resources, mission-II B; 2019 (GSI)*

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

Mineral	Unit	Reserves				Remaining resources								Total resources (A+B)
		Proved STD 111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	
			STD121	STD122			STD221	STD222						
Apatite	tonne	-	-	-	-	-	-	-	-	-	-	351000	351000	351000
Ball clay#	tonne	20900	-	-	20900	342169	-	-	403801	-	49670	-	795640	816540
Bauxite	'000 tonnes	154911	2094	28229	185234	17324	35470	3925	28953	22107	56857	710	165347	350581
Bentonite	tonne	9221227	-	-	9221227	6838864	-	12460170	2163813	1904	113259150	-	134723901	143945128
Calcite#	tonne	-	-	-	-	-	-	-	-	-	12380	-	12380	12380
Chalk#	'000 tonnes	4215	529	319	5064	741	331	151	196	-	269	-	1687	6751
China clay#	'000 tonnes	54111	3486	19671	77268	25378	4790	28542	1663	4198	49337	4114	118021	195289
Copper														
Ore	'000 tonnes	-	-	-	-	2470	3010	1380	129	-	7131	-	14120	14120
Metal	'000 tonnes	-	-	-	-	30.13	36.72	29.04	0.69	-	113.38	-	209.96	209.96
Diatomite	'000 tonnes	-	-	-	-	-	-	-	-	-	811	-	811	811
Dolomite#	'000 tonnes	34862	15934	20829	71625	11947	27064	68785	20263	63780	280592	-	472431	544056
Fire clay#	'000 tonnes	231	-	56	287	1193	664	966	2120	1053	53526	-	59522	59809
Fluorite	tonne	-	-	-	-	4279230	-	-	-	5723360	2001920	-	12004510	12004510
Granite														
(Dim. stone)	'000 cu m	-	-	-	-	-	-	-	-	-	8501947	-	8501947	8501947
Graphite	tonne	-	-	-	-	-	-	-	-	2520805	835000	-	3355805	3355805
Gypsum#	'000 tonnes	4	5	24	33	4	-	-	616	308	15446	-	16374	16407
Laterite#	'000 tonnes	36019	-	399	36418	8095	-	1467	-	-	-	-	9562	45981
Lead-zinc														
Ore	'000 tonnes	-	-	-	-	2470	3010	1380	129	-	200	-	7189	7189
Lead metal	'000 tonnes	-	-	-	-	74.10	90.30	41.40	3.90	-	-	-	210	210
Zinc metal	'000 tonnes	-	-	-	-	123.5	150.5	69	1.10	-	-	-	344.	344.
Lead & zinc														
metal	'000 tonnes	-	-	-	-	-	-	-	-	-	0.90	-	0.90	0.90

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Table - 1 (concld.)

Mineral	Unit	Reserves				Remaining resources								Total resources (A+B)
		Proved STD 111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	
			STD121	STD122			STD221	STD222						
Limestone	'000 tonnes	750236	173244	76324	999804	277146	159554	120210	21110	906641	18772852	-	20257514	21257318
Manganese ore	'000 tonnes	708	-	-	708	-	-	-	-	-	2180	-	2180	2888
Marble	'000 tonnes	-	-	-	-	-	26571	45000	-	17129	34871	-	123571	123571
Marl	tonne	117115856	4650000	2090000	123855856	11704870	-	-	-	-	-	-	11704870	135560726
Ochre#	tonne	37862	-	75703	113565	-	32699	4303	-	-	3016066	-	3053068	3166633
Perlite	'000 tonnes	-	-	-	-	140	683	595	-	-	-	988	2406	2406
Quartz-silica sand#	'000 tonnes	27892	5617	15260	48769	26742	6681	17809	2932	3371	26099	21	83656	132425
Phosphorite/ Rock phosphate	tonne	-	-	-	-	-	-	-	-	-	314820	-	314820	314820
Talc/soapstone/ steatite#	'000 tonnes	-	-	4	4	-	20	9	-	-	4	-	33	37
Vermiculite	tonne	-	-	-	-	-	-	-	-	-	1960	-	1960	1960
Wollastonite	tonne	-	-	-	-	-	-	-	-	-	1990000	-	1990000	1990000

Figures rounded off.

 # Declared as minor mineral vide Gazette notification dated 10.02.2015.

Note: *TheProved and Indicated balance recoverable reserves of crude oil and natural gas as on 1.4.2016 in the State are 138.49 million tonnes and 72.20 billion cu. m, respectively.*

Table – 3 : Details of Exploration Activities in Gujarat, 2018-19

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Bauxite							
Kachchh	East of Umarsar, Lakhpat taluka	Large 1:4000	50 3	- -	- -	- -	Reconnaissance survey for lateritic bauxite, clay and possible REE mineralisation around east of Umarsar, Lakhpat taluka, western Kachchh district involved large scale mapping of 50 sq.km area on 1:12,500 scale, detailed mapping of 3 sq.km area on 1:4,000 scale around Dharesi, Akri, Umarsar and Chugger villages along with pitting/trenching of 100 cu.m and collection of BRS, PTS and XRD, PS/OS samples. Detailed mapping was carried out in 3 blocks around Dharesi, Akri, Umarsar and Chugger villages. The strike continuity, width and thickness of the laterite/bauxite in the area were found to vary from 1.8 to 4.3 km, 0.8 to 255 m and 0.5 to 5.5 m, respectively. Pisolitic structures have been observed in bauxite of Dharesi block.
Kachchh	Asambiya Nana, Mandvi	1:12500 1:4000	50 3	- -	- -	- -	Reconnaissance survey for lateritic bauxite and clay was carried out around Asambiya Nana, Mandvi taluka, western Kachchh district. The investigation involved detailed mapping of 5.9 sq. km area on 1:4,000 scale. The bauxite/lateritic bauxite band extended for a strike length of 3.7 km with width varying from 160 m to 700 m. The cumulative thickness of primary and secondary bauxite was found to vary from 1 m to 18 m. EPMA study showed that the clast/ framework grains of bauxite were enriched in Al_2O_3 (up to 87%) while matrix part was enriched in FeO (up to 81%). TiO_2 was also found to be associated with the clasts/ oolitic grains. Out of the 55 samples were tested for ICPMS results, one sample showed values for La -1,867 ppm, Ce-1,039 ppm and Pr-425 ppm.

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Table - 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
REE							
Chhota Udaipur	Ambala-Rangpur Area	1:12500	109	-	-	-	During reconnaissance survey for REE and RM in Ambala-Rangpur Area, Chhota Udaipur district, an area of 109 sq.km was mapped on 1:12,500 scale and 25 cu..m. pitting and trenching were carried out. Skarn zones were seen to be developed at the contact of granite and dolomite and marble/ calc silicate rocks. Some of them are amazonite-bearing which is the probable host for Rare metal mineralisation in the area. A number of skarn zones have been reported in the area and in the skarn zone towards south of Village Ambala , presence of psilomelane has been confirmed which also was found to host Nb-Ca-Mn-Ti-Sb (Sb 45%, Nb_2O_5 3.8%, TiO_2 13.26%, CaO 25%, MnO 8.14%) and may be romeite. It also hosts parisite, spessartine & andradite varieties of garnet and pyrite along with barytes, ilmenite and lead. Analysis of BRS of skarn rock from Bharmadev Dungar showed, anomalous HREE values with 902.68 ppm yttrium, 101 ppm erbium, 154 ppm ytterbium and 109 ppm of dysprosium along with Sn, Be and Ta. The sample from Village Chisadiya developed over grey porphyritic granite has analysed 1,233 ppm tREE. The value of tREE in clay fraction was more than sand or silt which indicates more REE adsorption in clay. SEM studies showed presence of titanomagnetite which was found to host monazite along the cleavage, ilmenorutile (Nb-Ta-bearing) and monazite. Mineral chemistry (EPMA) of granitoids, skarn rocks, calcsilicate rocks and various types of pegmatites revealed presence of LREE silicates, thorite, monazite, xenotime and Sn-W-rich phases. Allanite, magnetite-allanite association, parisite, britholite and fluorine-bearing LREE phosphates were the REE phases identified during EPMA analysis.

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Table- 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Chhota Udaipur	Lagami-Koliyathar area	1:12500	118	-	-	254	Reconnaissance survey for REE and RM in Lagami-Koliyathar area, Chhota Udaipur district was taken up with large scale mapping of 118 sq. km on 1:12,500 scale, collection of 100 BRS in grid pattern, 20 PCS, 25 cu.m of pitting/ trenching, 50 stream sediments and 59 regolith samples. The SEM study of pegmatite reveals Nb-Ta bearing mineral phase (Nb 73% and Ta 3%) hosted in ilmenite associated with chloritised mica. EPMA study of granite and pegmatite indicates presence of allanite, britholite, parisite as well as thorite associated with allanite, magnetite-allanite association, parisite-britholite association.
Chhota Udaipur	Ambadongar	1:1000	-	43	7550	-	A G2 stage REE investigation with detailed mapping on 1:1,000 scale and drilling of 7,550 m to explore the REE was carried out in Ambadongar Carbonatite Complex with the objective to assess the potentiality of REE and RM in carbonatite. Petrography study revealed that the carbonatite is mainly constituted of 80% to 90% calcite whereas apatite, amphibole, pervoskite, zircon and barite occur as minor constituents. The Electron Probe Micro-Analyzer (EPMA) study of core samples indicated the presence of REE associated mineral phases like bastnasite, parasite, synchesite, apatite, fluoroapatite and monazite whereas the RM minerals are mainly associated with pyrochlore. A total of 43 boreholes were drilled to a cumulative depth of 7,550 m with 125 m to 260 m vertical depth in the northern part of Ambadongar area to assess the potentiality of REE. The analytical results of the core sample show encouraging value (0.3% average grade with 0.25% cut off) for REE and Nb (400 ppm average

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Table- 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							grade with 200 ppm cutoff). The resource estimation will be taken up after the receipt of all the analytical data.
Chhota Udaipur	Moriyagaon-Amba-Dareri-Sorwa area	1:12500	100	-	-	-	Reconnaissance survey was taken up for REE/ RM mineralisation with associated tin (Sn) and tungsten mineralisation in Moriyagaon-Amba-Dareri-Sorwa area in Alirajpur district, Madhya Pradesh and in parts of Chhota Udaipur District, Gujarat. Large Scale Mapping on 1:12,500 scale was carried out in Moriyagaon-Amba-Dareri-Sorwa area in 100 sq. km area with sampling. Allanite, apatite and zircon are the REE-bearing phases in the rocks. The maximum value of total REE was 947 ppm mostly associated with the alkali feldspar granite exposed NW of Doveri village. A very small mineralized zone of manganese noticed around Moriyagaon village. The bedrock samples analysed Mn values of 19.6% and 4.0%.
Limestone							
Junagadh	Shepa, Sheriyakhan area, Mangrol Taluka	1:4000	5.4	30	1017.0	890	G2 stage general exploration for limestone suitable for steel melting shop/ cement grade and BF involved detailed mapping with boreholes drilling in 400 m x 400 m grid pattern and collection of 870 powdered core samples, 10 samples each for XRD and thin sections. Limestone was found to be the sole lithological unit exposed on the surface. Limestone and clay of Dwarka and Gaj Formation have been intersected in the boreholes. Preliminary chemical analysis suggests that both limestone and yellowish calcareous clay satisfy the criteria for cement-grade limestone. Most of the survey area was covered by limestone of Miliolite Formation. The average thickness of Miliolite Formation was seen to be 5 m in

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Table- 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							subsurface with maximum thickness of 15 m observed in 2 boreholes. The Dwarka Formation was observed to be represented by both limestone and calcareous clay. The Dwarka clays appeared light grey to greenish grey coloured while the limestone was brown coloured, highly fossiliferous; the fossils are highly recrystallised (shells have been replaced by silica) and are only observed in core samples. In all the boreholes, the limestone of Miliolite Formation was seen to be followed by the intersection of Dwarka Formation.
Heavy Minerals							
Off Alang in the Gulf of Khambhat	Khambhat area	-	69	-	-	72	A Preliminary search and study of placer mineral distribution was taken up in the seabed around an area of 69 sq.km falling within 3 m to 30 m water depth off Alang in the Gulf of Khambhat, Gujarat. Area has been investigated with 90 lkm of bathymetric survey and collection of 41 vibro cores and 31 grab samples. The heavy mineral analysis of the seabed sediment samples indicated that the weight percentage of total heavy minerals vary from 3.4 to 22.6 wt% with an average of 12.5 wt%. Grain mount studies of heavy minerals showed presence of magnetite and ilmenite with non-opaque minerals.
Off Mithi Virdi	off Mithi Virdi Gujarat (Block-3)	-	75 within water depth of 9.6 m to 43.1 m	-	-	80 Sediment samples	Preliminary search of heavy minerals placer was taken-up to cover an area of 75 sq.km within the water depths of 9.60 to 43.10 m in the surface sediments off Mithi Virdi, Gujarat (Block-3). A total of 90 lkm of bathymetry was carried out and a total of 80 sediment samples were collected. Bathymetric data showed presence of channel in the western and central part of survey arean at depth ranging from 29.0 m to 41.0 and shallow patches in the

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Table- 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							eastern part. The surface sediment of the area is dominant by brownish/greyish medium to very fine sand and sub-surface sediment is greyish fine to very fine sand with clay.
Off Bhavnagar	Off Bhavnagar Gujarat (Block-5)	-	75 within water depth of 9.5 m to 41.7 m	-	-	15 virbo cores, 69 grab and 1 gravity core samples	Preliminary search of heavy minerals placers in the surface sediments off Bhavnagar, Gujarat (Block-5) was taken up to search and study placer mineral distribution in the seabed around an area of 75 sq. km falling within 9.5 m to 61.7 m water depth off Bhavnagar, Gujarat in the Gulf of Khambhat. A total of 155 lkm of bathymetric survey indicated that the seafloor off Bhavnagar, Gujarat, comprises undulating channels and sand ridges of tidal regime. Sediment sampling was carried out in 1 x 1 km grid pattern and virbo cores (15 nos), grab samples (69 nos.) and one gravity core sample within the water depths of 9.5 m to 61.7 m were collected. Sediments of medium to fine sand, fine to very fine sand, silty sand, sandy silt were observed to consist of heavy minerals and were devoid of shells & shell fragments. Studies are in progress.
Off Hathab	Off Hathab Gujarat (Block-VI)	-	75 within water depth of 11 m to 56 m	-	-	90 grab samples	Preliminary search of heavy mineral placer in the surface sediments off Hathab, Gujarat was taken up over an area of 75 sq. km (Block-VI) in 1 x 1 km grid, off Khambhat. A total of 157 lkm bathymetric survey was carried out and 90 grab samples within water depths of 11 m and 56 m were collected. The sand sediments were found to contain considerable amount of heavies, mostly in finer fraction with total Heavy Mineral content varying from 2 to 12%. The heavy mineral assemblage in the sediments included ilmenite, magnetite, rutile, sillimanite, pyroxenes, amphiboles, epidote, etc.

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Table- 3 (Concld)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Commissioner of Geology & Mining, Gujarat							
Limestone							
Dwarka	Devbhume, Dwarka	-	-	12	495.00	104	Exploration over an area of about 36.86 ha was taken up with an objective to identify auctionable block. Reserves/Resource estimation is under process.
Junagadh	Junagadh	-	-	18	905.00	91	Exploration over an area of about 24.65 ha was taken up with an objective to identify auctionable block. Reserves/Resource estimation is under process.
Gir Somnath	Gir Somnath	-	-	85	2879.50	393	Exploration over an area of about 150.00 ha was taken up with an objective to identify auctionable block. Reserves/Resource estimation is under process.
China clay							
Kachchh	Kachchh	-	-	37	3071.00	-	Exploration over an area of about168.90 ha was taken up with an objective to identify auctionable block. Reserves/Resource estimation is under process.
Bentonite							
Kachchh	Kachchh	-	-	11	574.60	-	Exploration over an area of about 250.00 ha was taken up with an objective to identify auctionable block. Reserves/Resource estimation is under process.
GMDC							
Bauxite							
Kachchh	Daban Wamoti, Ratadia-Nagrecha, Nana Goniyasar and Wandh-1 mines	-	-	100	3114	233	In Gujarat, exploration in four mines i.e. Daban Wamoti, Ratadia-Nagrecha, Nana Goniyasar and Wandh-1 of Calcinied bauxite Project, Gadhasis, Kuchchh district comprised excavation of 233 pits, drilling of 3114.0 meterage in 100 boreholes and collection of 233 samples. A total of 4.87 million tonnes of bauxite reserve under UNFC code 111 was estimated in Daban-Wamoti, and Ratadia-Nagrecha mines.

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

(Value in ₹ '000)

Mineral	Unit	2016-17			2017-18			2018-19 (P)		
		No. of mines	Quantity	Value$	No. of mines	Quantity	Value$	No. of mines	Quantity	Value$
All Minerals		**212**		**60345979**	**207**		**74236544**	**185**		**74464584**
Lignite	'000t	-	10546	-	-	13781	-	-	12565	-
Natural Gas (ut.)	m c m	-	1580	-	-	1605	-	-	1349	-
Petroleum(crude)	'000t	-	4605	-	-	4591	-	-	4625	-
Bauxite	t	92	5881257	3127056	81	3559241	2129517	75	2181064	1293201
Manganese Ore	t	2	43057	20605	1	18362	11496	1	-	-
Fluorite(graded)	t	1	-	-	-	-	-	-	-	-
Limestone	'000t	117	25813	5110332	125	26019	5414111	109	26237	5371429
Marl	t	-	2203700	317886	-	1870836	295367	-	1794940	297309
Sulphur#	t	-	100952	-	-	95343	-	-	91962	-
Minor Minerals		-	-	51770100	-	-	66386053	-	-	67502645

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

$ Excludes the value of Fuel minerals.

 # Recovered as by-product from oil refineries.

Table – 5 : Principal Mineral-based Industries

Industry/plant	Capacity ('000 tpy)
Abrasives	
Bombay Mineral Limited Jam Khambhalia	86.4 (Abrasive Grain)
Carborandum Universal Ltd, Okha, Distt Jamnagar.	NA
Carborandum Universal Ltd, Bhatia, Distt Jamnagar.	NA
Flexo-Plast Abrasives, Ahmedabad.	NA
Orient Abrasive Ltd. Porbandar	75 (Abrasive Grain) 150 (Calcined Bauxite) 30 (Castable Refractory)
Asbestos Products	
Ramco Industries Ltd, Singura, Distt Kachchh.	72
Sanghi Industries Ltd, Sanghipuram, Distt Kachchh.	36
U.P. Asbestos Ltd, Valsad.	36

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Table - 5 (Contd)

Industry/plant	Capacity ('000 tpy)
Cement	
Ambuja Cements Ltd, Ambuja Nagar, Distt Junagadh.	5700
Ambuja Cement Ltd, Magdalla, Distt Surat (G).	1560
Mehta Group Gujarat Sidhee Cement, Sidheegram, Sutrapada Distt Junagadh.	1200
Mehta Group Saurashtra Cement Ltd, Porbandar, Distt Junagadh.	1500
Saurashtra Cement Ltd, Ranavav Porbandar,	3063
Hi Bond Cement, Gondal.	1200
J. K. Laxmi, Kalol, Distt Ganghinagar (G).	1000
J. K. Laxmi, Surat	1350
Sanghi Industries Ltd, Sanghipuram, Distt Kachchh.	4000
Shree Digvijay Cement Co. Ltd, Digvijaygram, Sikka Distt Jamnagar.	1200 (43 Gr.) 1200 (53. Gr.) 1200 (PPC) 1200 (Oil well cement) 1200 (Sulphate Resisting P.C.)
Tata Chemicals Ltd, Mithapur, Distt Jamnagar.	500
UltraTech Cement Co. Ltd, Pipavav,	6400

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Table - 5 (Contd)

Industry/plant	Capacity ('000 tpy)
Distt Amreli.	
UltraTech Cement Ltd, (Narmada Cement), Jafrabad, Distt Amreli.	1450
UltraTech Cement Ltd, (Gujrat Cement), Kovaya Babarkot Rajula Jafrabad,	6400
UltraTech Cement (formerly a unit of JCCL), Sewagram, Abdasa, Distt Kachchh.	2400
UltraTech Cement (formerly a unit of JCCL), Wanakbori, Distt Kheda (G).	2400
UltraTech Cement Ltd, Magdalla (G).	750
Sparta Cements & Infra Ltd. Bhuj	1000
Vadraj Cement, Mora, Surat	6000
Ceramic	
Unifrax India, Lakhtar	7.5 (Ceramic fiber product)
Orient Glazes Ltd, OGPL Kheda Unit Radhu	35.53
Chemical	
Baroda Rayon Corpn. Ltd, Surat.	15000 (yarn) 21600 (H_2SO_4) 2.2 (sodium sulphate)
Century Chemicals, Nava Nanga, Distt Jamnagar.	108 (refined salt)
Gujarat Alkalies & Chemicals Ltd, Baroda.	14.9 (caustic soda)
Gujarat Alkalies & Chemicals Ltd, Dahej, Distt. Bharuch.	242.6 (caustic Soda) 151.4 (Cl) 33.408 (phosphoric acid)
GHCL Limited, Sutrapada.	1100 (Soda Ash) 71 (Sodium bicarbonate)
Indian Rayon Industries Ltd, Veraval, Distt Junagadh.	21 (yarn) 35.7 (H_2SO_4) 10 (carbon disulphide) 9.3 (sodium sulphate) 91.3 (caustic soda)
Kamadhenu Nutrients Pvt.ltd. Panoli,Ankleshwar	10.8 (Dicalcium phosphate)
Kohler India Corp. Pvt. Ltd, Jhagadia,Talodara	15.02 (2Pc B) 8.29 (lav) 2.25 (Pedestal) 4.73 (tank)
Navin Fluorine Industries Ltd, Surat.	22 (HF)
Nirma Cement Ltd, Ranavav	421.2 (Soda ash)
Nirma Soda Ash Plant Kalatalav, Bhavnagar	1008 (Soda Ash Light) 648 (Soda Dense) 144 (Refined Sodium Bicarbonate) Vaccun Salt (864)
Saurashtra Chemicals Ltd, Porbandar, Distt Porbandar	365 (soda ash) 20.4 (caustic soda) 26.4 (refined bicarbonate)

(Contd)

Table - 5 (Contd)

Industry/plant	Capacity ('000 tpy)
Shree Sulphurics Pvt. Ltd, Ankleshwar, Distt Bharuch.	58 (H_2SO_4) 12 (chloro-sulphuric acid)
Tata Chemicals Ltd, Mithapur, Distt Jamnagar.	875 (soda ash)
Copper Smelter	
Hindalco Industries Ltd, Birla Copper, Dahej, Distt Bharuch.	500 (copper smelting) 1670 (H_2SO_4) 15 tonnes (Au) 150 tonnes (Ag)
HCL, Gujarat Copper Project, Jhagadia, Distt. Bharuch.	50 (electrolytic copper) 20 (copper anodes)
Electrode	
Power Elctrode Varaval Shapar Kotda Sangani	0.60
Fertilizer	
Aarti Fertilizers, Vapi, Valsad	132 (SSP)
Coromandel International Ltd (Formerly Liberty Phosphate Ltd), Nandesari, Vododara GSFC, Vadodara	100 (SSP) 367 (urea) 108 (DAP) 200 (complex) 196 (AS)
GSFC, Sikka (Sikka - I & II), Jamnagar	326 (DAP)
GNFC, Bharuch	636.9 (urea) 142.5 (complex)
Hindalco Industries Ltd, Dahej, Distt Bharuch	400 (DAP/ complex)
IFFCO Ltd, Kandla, Distt. Kachchh	2420
IFFCO Ltd, Kalol, Distt. Gandhinagar	602 (urea)
Khaitan Chemicals & Fertilizers Ltd, Dahej, Bharuch	200 (SSP)
KRIBHCO Ltd, Hazira, Distt. Surat	2195 (urea)
Narmada Agro Chemicals Pvt. Ltd, Mangrol, Junagadh	33000 (SSP)
Narmada Bio-chem Pvt. Ltd, Kalyangadh, Ahmedabad	196000 (SSP)
Nirma Ltd, Moraiya, Ahmedabad	100 (SSP)
Sona Phosphates Ltd, Sarigam, Valsad	15 (SSP)
T J Agro Fertilizers Pvt. Ltd, Navsari	22 (SSP)
Foundry	
Steelcast Ltd, Ruvapuri Road, Bhavnagar	30
Intolcast Pvt. Ltd, 16, 17 & 19 Ankur Industrial Complex, Rajkot Gundal Road Shaper, Rajkot	2.4 (steel casting)
Intricast Pvt. Ltd, 25/28 Galaxy Industrial Estate, Rajkot Gundal Road Shaper, Rajkot	1.08 (steel casting)
Invac Cast Pvt. Ltd, 444, 453 & 455 Nana Fofadia Road Bamangam, Vadodra	2.4 (steel casting)

(Contd)

Table - 5 (Contd)

Industry/plant	Capacity ('000 tpy)
Gujrat Intuxt Ltd.184/P, Rajkot Gundal Road Shaper, Rajkot	1.8 (steel casting)
Iron & Steel	
Essar Steel Ltd, Hazira, Distt Surat	6700 (sponge iron) 10000 (crude/liquid steel)
Jindal Saw Ltd, Samaghogha, Mundra	900 (Sinter) 580 (Pig Iron)
Ferro Alloys	
Baroda Ferro Alloys Ltd, Panchmahals.	3.5
Essel Mining & Industries Ltd, Vapi, Distt Valsad.	9
Electro Ferro Alloys Ltd, Ahmedabad.	0.3
Sponge Iron	
Electrotherm India Pvt. Ltd, Samakhalli, Distt Kachchh	75
Gallant Metal Ltd, Samakhialli, Distt Kachchh	225000
Global Hi-Tech Industries Ltd, Bhuj, Distt Kachchh	105
Welspun Steel Ltd, Versamedi, Anjar	144
Glass	
Alembic Glass Industries Ltd, Baroda.	35.0
Bhagwati Glass Containers Ltd, Kalol.	8.7
Bharat Glass Tube Ltd, Bharuch.	7.2
Gobind Glass & Industries Ltd, Kadi.	NA
Gopal Glass Works Ltd, Budasan, Distt Mehsana.	40.6
Gujarat Borosil Ltd, Govali, Distt. Bharuch.	62.5
Piramal Glass Ltd, Jambusar.	355 (tpd)

(Contd)

Table - 5 (Concld)

Industry/plant	Capacity ('000 tpy)
Piramal Glass Ltd, Kosamba.	340 (tpd)
Haldyn Glass (Gujarat) Ltd, Padra, Vadodara.	320 TPD
Prestige Glass Industries Pvt Ltd, Vagra.	11.5
Petroleum Refinery	
IOCL, Koyali.	13700
RPL, Jamnagar	33000
RPL, Jamnagar (SEZ).	27000
Essar Oil Ltd, Vadinar.	20000
Refractory	
Calders India Refractorie Ltd, Bhayati Jambudiya, Wankaner	42
Lilanand Magnesite Pvt. Ltd, Dharmpur, Ranavav	10.8
Synthetic Gas	
Reliance Industries Ltd, JG-DTA Gasification Area, Kunalus Lalpur	13122.48
Calcined Bauxite	
Birla VXL Ltd, Porbandar	36
Bombay Minerals Ltd, Jamkhambhaliya	96
Gujarat Credo Mineral Industries Ltd, Naredi, Abdasa	500 (dry beneficiated) 10 (processed bauxite)
Saurashtra Calcine Bauxite & Allied Industries Ltd, Bhatia	39
Shri Natraj Ceramics & Chemical Industries Ltd, Khambhaliya	24

G: Grinding Unit

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.