

THE MINERAL INDUSTRY OF VIRGINIA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Virginia Division of Mineral Resources for collecting information on all nonfuel minerals.

Virginia climbed in rank from 25th to 22d among the 50 States in total nonfuel mineral production value¹ in 1996, according to the U.S. Geological Survey (USGS). The estimated value for 1996 was almost \$529 million, a nearly 3% increase from that of 1995. This followed a 2.6% increase in 1995 from 1994 (based on final 1995 data). In 1996, the State accounted for about 1.5% of the U.S. total nonfuel mineral production value.

Virginia mines almost exclusively produce industrial minerals and coal. The last significant metal production occurred in 1981 when the State's only consistently active metal mine, an underground zinc operation, closed down because of the recession and a depressed metal market. While a diverse variety of minerals were produced in 1996 in Virginia, crushed stone accounted for 64% of the State's nonfuel mineral value. In 1996, the value of crushed stone increased by about \$13 million, the most of any nonfuel mineral in Virginia for the year. From 1990 through 1996, Virginia produced more than 360 million metric tons of crushed stone, or an average of 51.6 million metric tons per year. Compared with 1995, most nonfuel mineral commodities increased in value. Portland cement, kyanite, common clays, vermiculite, and gemstone values all decreased by small amounts.

Based on USGS estimates of quantities produced in the 50 States during 1996, Virginia remained the only State to mine kyanite, second in the production of feldspar, second of two States that produce vermiculite, fourth in iron oxide pigments, and ninth in crushed stone. The State dropped in rank from eighth to ninth in the production of lime. While the only producing kyanite mine in the United States was in Virginia, mullite, a calcined kyanite, was synthetically produced in three other States. About 90% of U.S. kyanite and mullite output is used in refractories for the smelting and processing of a variety of metals and in glass and high-temperature ceramics manufacturing. Additionally, significant quantities of construction and industrial sand and gravel, masonry cement, and common clays were produced in the State.

The following narrative information was provided by the Virginia Division of Mineral Resources (VDMR).² Several companies conducted reconnaissance geologic, geochemical, and geophysical investigations for base and

precious metals in the central Piedmont province of Virginia. Gold Crown Mining Co. continued to permit and intermittently work the old Kentuck Mine, east of Danville, Pittsylvania County, for small amounts of gold; and Southern Piedmont Mining continued to permit the old Moss gold mine in Goochland County. JLJ Enterprises was not active in processing any ore during the year from its permitted site near the Goochland County-Fluvanna County line.

During the early spring of 1996, the Harris Group purchased U.S. Silica Co., including the Montpelier operation in Hanover County, north of Richmond, which quarried and processed glass-grade feldspar.

During the spring, Golden Cat, a Division of Ralston Purina Co., began construction of a cat box filler manufacturing plant, about 40 kilometers northeast of Richmond, in King William County. The plant and other related costs for the Virginia facility were estimated to total up to \$25 million. Increased tax revenues for the county were anticipated to be about \$50,000 per year and up, and the new plant will hire about 70 people. The company plans to begin producing cat litter box filler products in July 1997.

In August, Cyprus Foote Mineral Co. shut down its lithium hydroxide plant at Sunbright, Scott County, in the southwestern part of the Commonwealth in deference to producing all of its lithium-carbonate at its new facility in Silver Peak, NV.

In November, U.S. Gypsum Co. announced that it will be closing its wallboard plant in Plasterco, VA (near Saltville) as well as its slope-entry underground gypsum mine in adjacent Smyth County in May 1999. The company will build a modern \$110-million plant in Bridgeport, AL, which will open soon after the Virginia operation (which has been in operation for 75 years) closes.

At the end of the year, RGC (USA Minerals) was constructing a plant southwest of Stony Creek, in Sussex County, to mine heavy-mineral sand in adjacent Dinwiddie County. The company will invest about \$20 million in preparation of its plant and open pit mine; water will be pumped from the Nottoway River, about 3 kilometers away, to the plant.

Cedar Mountain Stone continued to operate two crushed stone operations—its granite quarry in Louisa County, as well as a diabase quarry, near Mitchells in Culpeper County. The company has stripped a site just west of State Road 615 and opened up a dimension stone quarry; in the early fall, Cedar Mountain began sending blocks of granite, by truck, to a finishing plant in Georgia.

The VDMR continued geologic mapping in several counties at a detailed 1:24,000 scale and continued to compile and digitize 1:100,000-scale maps. The agency also continued field studies and compilation of identified mineral resources on 1:24,000-scale maps, the statewide carbonate project, the epithermal hot springs study, the coalbed methane resources study, and oil and gas studies of Dickenson County and Russell County. Completed during 1996 were a study on diamonds in Virginia; the Wise County oil and gas study; and a statistics report on the 1995 production of coal, oil and gas, and industrial and metallic mineral resources in Virginia. Published during the year were a study on the geology and mineral resources of Henry County and the City of Martinsville; a composite Devonian and Lower Mississippian geologic cross section near Norton, VA; a structural geologic cross section across the Atlantic Coastal plain; a 1:100,000-

scale geologic map of Clarke, Frederick, Page, Shenandoah, and Warren Counties; and a statistics report on coal, oil and gas, and industrial and metallic mineral resources produced in the Commonwealth during 1994.

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1996 USGS mineral production data published in this chapter are estimates as of February 1997. For some commodities (for example, construction sand and gravel, crushed stone, and portland cement), estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset, and request Document # 1000 for a telephone listing of all mineral commodity specialists, or call USGS information at (703) 648-4000 for the specialist's name and number. This telephone listing may also be retrieved over the Internet at <http://minerals.er.usgs.gov/minerals/contacts/comdir.html>

²Palmer Sweet, Head Geologist with the VDMR, authored the text of mineral industry information submitted by that agency

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN VIRGINIA 1/ 2/

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1994		1995		1996 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement (portland)	930	54,700	W	W	W	W
Clays	870 3/	3,250 3/	891	3,200 3/	912	2,890 3/
Gemstones	NA	W	NA	W	NA	11
Lime	742	40,200	731	41,900	748	42,800
Sand and gravel (construction)	8,060	33,400	9,710	42,300	10,100	44,900
Stone:						
Crushed	56,700	327,000	55,400	326,000	57,000	339,000
Dimension metric tons	108 4/	13 4/	W	W	W	W
Combine value of cement, clays (fuller's earth), feldspar, gypsum (crude), iron oxide pigments (crude), kyanite, sand and gravel (industrial), stone [dimension dolomite, slate, and traprock (1995-96), dimension granite and slate (1994)], talc and pyrophyllite (1994, 1996), vermiculite, and values indicated by symbol W	XX	43,600	XX	101,000	XX	98,900
Total	XX	502,000	XX	515,000	XX	529,000

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

2/ Data are rounded to three significant digits; may not add to totals shown.

3/ Excludes certain clays; kind and value included with "Combined value" data.

4/ Excludes certain stones; kind and value included with "Combined value" data.

TABLE 2
VIRGINIA: CRUSHED STONE^{1/} SOLD OR USED BY PRODUCERS IN 1995, BY USE ^{2/}

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	360	\$1,410	\$3.92
Riprap and jetty stone	923	6,870	7.45
Filter stone	796	4,850	6.09
Other coarse aggregate	448	2,400	5.35
Coarse aggregate, graded:			
Concrete aggregate, coarse	5,870	35,900	6.11
Bituminous aggregate, coarse	2,360	15,200	6.44
Bituminous surface-treatment aggregate	1,160	7,960	6.86
Railroad ballast	290	1,940	6.69
Other graded coarse aggregate	1,400	10,000	7.16
Fine aggregate (-3/8 inch):			
Stone sand, concrete	664	4,450	6.70
Stone sand, bituminous mix or seal	910	5,930	6.52
Screening, undesignated	1,940	11,000	5.66
Coarse and fine aggregates:			
Graded road base or subbase	9,340	48,200	5.16
Unpaved road surfacing	1,130	6,340	5.61
Crusher run or fill or waste	1,750	8,360	4.78
Other construction materials ^{3/}	2,680	18,800	7.01
Agricultural:			
Agricultural limestone	729	10,400	14.25
Poultry grit and mineral food	107	1,090	10.20
Other agricultural uses	(4/)	(4/)	11.43
Chemical and metallurgical:			
Cement manufacture	(4/)	(4/)	3.32
Lime manufacture	715	3,690	5.16
Flux stone	(4/)	(4/)	2.14
Chemical stone	(4/)	(4/)	11.02
Glass manufacture	305	3,110	10.21
Sulfur oxide removal	(4/)	(4/)	7.28
Special:			
Mine dusting or acid water treatment	183	4,160	22.72
Asphalt fillers or extenders	220	1,280	5.82
Whiting or whiting substitute	(4/)	(4/)	34.19
Other fillers or extenders	72	1,110	15.35
Other specified uses not listed	1,590	7,240	4.56
Unspecified: ^{5/}			
Actual	17,400	95,200	5.48
Estimated	2,060	9,430	4.58
Total	55,400	326,000	5.89

1/ Includes dolomite, granite, limestone, miscellaneous stone, sandstone and quartzite, slate, and traprock.

2/ Data are rounded to three significant digits; may not add to totals shown.

3/ Includes lightweight aggregate (slate), waste material, and other coarse and fine aggregate.

4/ Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."

5/ Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3
VIRGINIA: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1994				1995			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone 2/	42	16,300	\$89,800	\$5.51	42	15,800	\$89,600	\$5.69
Dolomite	10	3,650	27,800	7.61	10	3,650	28,100	7.71
Granite	32 r/	22,800 r/	130,000 r/	5.73 r/	32	21,100	119,000	5.64
Traprock	9 r/	12,100 r/	68,900 r/	5.68 r/	10	12,600	73,200	5.84
Sandstone and quartzite	7	1,330	7,460	5.60	7	1,390	7,310	5.27
Slate	1	W	W	2.80	2	W	W	W
Miscellaneous stone	2	W	W	6.08	2	W	W	W
Total	XX	56,700	327,000	5.77	XX	55,400	326,000	5.89

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes limestone-dolomite, reported with no distinction between the two.

TABLE 4
VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1995, BY USE AND DISTRICT

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3
	Quantity	Value	Quantity	Value	Quantity
Construction aggregates:					
Coarse aggregate (+1 1/2 inch) 2/	1,100	5,840	W	W	W
Coarse aggregate, graded 3/	2,600	15,200	1,840	12,600	6,640
Fine aggregate (-3/8 inch) 4/	1,170	7,550	558	3,390	1,790
Coarse and fine aggregate 5/	3,250	15,700	W	W	W
Other construction materials 6/	(7/)	(7/)	2,690	18,000	10,400
Agricultural 8/	(9/)	(9/)	(9/)	(9/)	(9/)
Chemical and metallurgical 10/	2,560	12,700	(9/)	(9/)	(9/)
Special 11/	(9/)	(9/)	(9/)	(9/)	--
Unspecified: 12/					
Actual	4,220	23,800	2,410	14,300	10,700
Estimated	1,550	6,480	507	2,960	--
Total	17,600	105,000	8,180	52,900	29,600

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

3/ Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad and other graded coarse aggregate.

4/ Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesignated).

5/ Includes graded road base or subbase, unpaved road surfacing, crusher run (select material or fill), and other coarse fine aggregates.

6/ Includes lightweight aggregate (slate) and waste materials.

7/ Less than 1/2 unit.

8/ Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

9/ Withheld to avoid disclosing company proprietary data; included in "Total."

10/ Includes cement manufacture, chemical stone for alkali works, flux stone, glass manufacture, lime manufacture, and oxide removal.

11/ Includes asphalt fillers or extenders, mine dusting or acid water treatment, other fillers or extenders, whiting or whiting substitute, and other specified uses not listed.

12/ Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5
 VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1995,
 BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	1,860	\$10,500	\$5.65
Concrete products (blocks, bricks, pipe, decorative, etc.)	213	1,420	6.69
Asphaltic concrete aggregates and other bituminous mixtures	611	2,710	4.44
Road base and coverings	606	1,740	2.87
Fill	1,320	3,220	2.44
Snow and ice control	38	155	4.08
Other	120	558	4.65
Unspecified: 2/			
Actual	3,850	18,200	4.73
Estimated	1,100	3,810	3.47
Total or average	9,710	42,300	4.36

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6
 VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1995, BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products	W	W	W	W	1,660	9,220
Asphaltic concrete aggregates and road base materials 2/	207	1,190	127	521	2,200	5,960
Snow and ice control	W	W	W	W	25	101
Other miscellaneous uses	400	2,660	23	110	115	533
Unspecified: 3/						
Actual	24	110	1	5	3,820	18,100
Estimated	239	992	49	173	809	2,640
Total	870	4,950	200	808	8,640	36,500

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes fill.

3/ Includes production reported without a breakdown by end use and estimates for nonrespondents.