

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 ranked 24th among the 50 States in total nonfuel mineral production value¹ in 1995, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was almost \$517 million, a 3% increase from that of 1994. This followed an 8% increase in 1994 from 1993 (based on final data). In 1995, 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 due to the recession and a depressed market. Although a diverse variety of minerals were produced in Virginia, crushed stone accounted for 66% of the State's nonfuel mineral value. During the past 6 years, 1990-95, the State has produced more than 300 million metric tons of crushed stone or an average of 50 million metric tons per year. Compared with 1994, the value of the following nonfuel minerals and mineral products increased: crushed stone, lime, construction sand and gravel, kyanite, masonry cement, dimension stone, feldspar, talc, and gemstones. The values of portland cement, fuller's earth clays, gypsum, common clays, and vermiculite decreased.

Based on USGS estimates of quantities produced in the 50 States during 1995, Virginia remained second in the production of feldspar, second of two States that produce vermiculite, fourth in iron oxide pigments, seventh in talc, eighth in fuller's earth, and ninth in lime. The State dropped in rank from sixth to seventh in the production of crushed stone. While the only producing kyanite mine in the United States was in Virginia, mullite, a calcined kyanite, was synthetically produced in three other States. Ninety percent 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, Virginia mines and manufacturing plants produced significant quantities of construction and industrial sand and gravel, crude gypsum, common clays, and portland and masonry cements.

In 1995, according to the Virginia Division of Mineral Resources (VDMR),² several companies conducted reconnaissance geologic, geochemical, and geophysical investigations for base and precious metals in the Piedmont geologic province of Virginia, especially in Campbell and Goochland Counties. JLJ Enterprises trucked several loads of ore to their plant north of Clarksville in Mecklenburg County. Evaluation of techniques for processing the ore

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN VIRGINIA^{1 2}

Mineral	1993		1994		1995 ^p	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement (portland) metric tons	W	W	930,000	\$54,700	827,000	\$48,600
Clays ³ thousand metric tons	775	\$2,950	870	3,250	861	3,210
Lime do.	756	40,000	742	40,200	834	44,200
Sand and gravel (construction) do.	⁴ 9,000	⁴ 40,500	8,060	33,400	8,200	34,800
Stone:						
Crushed do.	51,000	292,000	56,700	327,000	58,500	342,000
Dimension metric tons	W	W	⁴ 108	⁴ 13	W	W
Combine value of cement (masonry), clays [bentonite (1993), fuller's earth], feldspar, gemstones, gypsum (crude), iron oxide pigments (crude), kyanite, sand and gravel (industrial), stone [dimension (1993, 1995), dimension granite and slate (1994)], talc, vermiculite, and values indicated by symbol W	XX	88,900	XX	43,600	XX	44,100
Total	XX	465,000	XX	502,000	XX	517,000

¹Estimated. ^pPreliminary. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

²Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

³Data are rounded to three significant digits; may not add to totals shown.

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

⁵Excludes certain stones; kind and value included with "Combined value" data.

continued. Gold Crown Mining Co. continued to intermittently mine small amounts of gold from the old Kentuck Mine, east of Danville, in Pittsylvania County.

In February, Dalrymple Realty Corp. of New York acquired the quarries of A.H. Smith Co. in Culpeper (diabase rock) and Louisa Counties (granite) and began operation of them in the summer.

On March 31, Tulikivi, Inc., a Finish company, discontinued producing soapstone stoves at their New Alberene Stone Co., Inc. plant in Schuyler, Nelson County. Although more efficient than the standard cast iron wood-burning stove, stoves produced from soapstone were not economically competitive. A sales office in Charlottesville continued taking domestic orders for stoves that are produced in Finland. The plant remained open, producing architectural stone by special order.

Interest in heavy minerals continued along the western edge of the Coastal Plain geologic province in southern Virginia. In Dinwiddie, Greensville, and Sussex Counties, more than 7 million metric tons (8 million short tons) of heavy mineral sands have been discovered and large acreages remain under lease by RGC (USA) Mineral Sands, Inc. Ilmenite, leucoxene, rutile, and zircon comprise nearly 80% of the known heavy mineral concentrate. RGC is mining a 1-acre site (pilot operation) to evaluate the ore from the Old Hickory deposit, near Bolsters Store, in Dinwiddie and Sussex Counties. In September and October, the Board of Supervisors in both counties approved conditional-use permits for RGC to mine titanium ores. Sussex County's Planning Commission has already approved zoning permits in that county. RGC

is planning to invest about \$20 million in the dry-mining venture.

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 several projects including 1:24,000 scale maps of the State's mineral resources, the Statewide carbonate rock identification project, and the epithermal hot springs study and oil and gas studies of Dickerson and Russell Counties. VDMR publications for the year included studies on coalbed methane in Virginia; cadmium, gallium, and germanium resources; a precious metals study; reports about coal beds, coal zones, and stratigraphic names of Pennsylvanian (geologic age) units of southwestern Virginia; a geologic map of Warren County; a 1990-94 bibliography and index of Virginia geology; a brochure on coal in Virginia; and a report on the statistics and compilation of coal, oil and gas, and industrial and metallic mineral resources produced in Virginia in 1993.

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 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most recent 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 No. 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.

²The remaining narrative portion of this report was based on information provided by the VDMR.

TABLE 2
VIRGINIA: CRUSHED STONE¹ SOLD OR USED BY PRODUCERS IN 1994, BY USE²

Use	Quantity (thousand metric tons)	Value (thousands)	Unit Value
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	\$4.41
Riprap and jetty stone	808	\$5,480	6.78
Filter stone	585	3,370	5.76
Other coarse aggregate	347	2,040	5.88
Coarse aggregate, graded:			
Concrete aggregate, coarse	5,160	31,800	6.18
Bituminous aggregate, coarse	3,040	19,500	6.40
Bituminous surface-treatment aggregate	917	6,070	6.62
Railroad ballast	407	2,490	6.11
Other graded coarse aggregate	641	4,150	6.47
Fine aggregate (-3/8 inch):			
Stone sand, concrete	784	5,300	6.76
Stone sand, bituminous mix or seal	481	3,110	6.46
Screening, undesignated	2,610	13,800	5.29
Other fine aggregate	270	1,680	6.22
Coarse and fine aggregates:			
Graded road base or subbase	7,690	39,400	5.12
Unpaved road surfacing	639	3,750	5.87
Terrazzo and exposed aggregate	30	89	2.97
Crusher run or fill or waste	3,150	14,100	4.46
Other coarse and fine aggregates	434	1,700	3.92
Other construction materials ³	2,720	18,200	6.67
Agricultural:			
Agricultural limestone	790	10,600	13.40
Poultry grit and mineral food	137	1,460	10.70
Other agricultural uses	(4)	(4)	11.00
Chemical and metallurgical:			
Cement manufacture	1,480	4,920	3.33
Lime manufacture	1,550	6,350	4.10
Flux stone	(4)	(4)	9.71
Chemical stone	(4)	(4)	7.84
Glass manufacture	304	3,200	10.50
Sulfur oxide removal	(4)	(4)	6.15
Special:			
Mine dusting or acid water treatment	(4)	(4)	25.30
Asphalt fillers or extenders	(4)	(4)	6.40
Whiting or whiting substitute	(4)	(4)	33.50
Other fillers or extenders	17	257	15.10
Abrasives	(4)	(4)	6.13
Other specified uses not listed	568	6,440	11.30
Unspecified:⁵			
Actual	20,500	114,000	5.55
Estimated	694	4,450	6.41
Total	56,700	327,000	5.77

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

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

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

³Includes drain fields.

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

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

TABLE 3
VIRGINIA: CRUSHED STONE SOLD OR USED, BY KIND¹

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	² 43	¹ 14,700	¹ 2\$85,600	¹ 2\$5.82	42	16,300	\$89,800	\$5.51
Dolomite	11	3,430	27,100	7.90	10	3,650	27,800	7.61
Granite	33	20,700	116,000	5.58	31	22,200	127,000	5.75
Traprock	10	10,600	55,500	5.26	10	12,700	71,800	5.64
Sandstone and quartzite	7	1,220	6,630	5.44	7	1,330	7,460	5.60
Slate	1	W	W	2.66	1	W	W	2.80
Miscellaneous stone	1	W	W	5.82	2	W	W	6.08
Total	XX	51,000	292,000	5.73	XX	56,700	327,000	5.77

¹Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

²Previously published and 1994 data are rounded to three significant digits; may not add to totals shown.

³Includes "limestone-dolomite," reported with no distinction between the two.

TABLE 4
VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) ²	917	4,790	241	1,640	794	5,400
Coarse aggregate, graded ³	2,780	15,700	1,990	13,200	5,400	35,100
Fine aggregate (-3/8 inch) ⁴	1,080	6,990	535	3,190	2,530	13,700
Coarse and fine aggregate ⁵	3,680	17,500	2,080	10,300	6,190	31,100
Other construction materials ⁶	(⁷)	(⁷)	242	1,190	(⁷)	(⁷)
Agricultural ⁸	(⁷)	(⁷)	(⁷)	(⁷)	—	—
Chemical and metallurgical ⁹	3,440	15,200	—	—	—	—
Special ¹⁰	(⁷)	(⁷)	(⁷)	(⁷)	—	—
Other miscellaneous uses ¹¹	(⁷)	(⁷)	—	—	—	—
Unspecified: ¹²						
Actual	3,880	21,700	(⁷)	(⁷)	(⁷)	(⁷)
Estimated	299	2,150	395	2,300	—	—
Total	18,000	104,000	9,660	57,900	29,100	165,000

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

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

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

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

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

⁶Includes drain fields.

⁷Withheld to avoid disclosing company proprietary data; included in "Total."

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

⁹Includes cement manufacture, chemical stone for alkali works, flux stone, glass manufacture, lime manufacture, and sulfur oxide removal.

¹⁰Includes asphalt fillers or extenders, mine dusting or acid water treatment, other fillers or extenders, and whitening or whitening substitute.

¹¹Includes other specified uses not listed.

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

TABLE 5
VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	2,810	\$14,800	\$5.28
Plaster and gunite sands	11	70	6.36
Concrete products (blocks, brick, pipe, decorative, etc.)	227	1,330	5.85
Asphaltic concrete aggregates and other bituminous mixtures	875	3,640	4.16
Road base and coverings	895	2,650	2.96
Fill	1,290	2,880	2.23
Snow and ice control	140	545	3.89
Other ²	119	547	4.60
Unspecified: ³			
Actual	1,490	6,050	4.06
Estimated	195	857	4.39
Total or average	8,060	33,400	4.15

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

²Includes filtration.

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

TABLE 6
VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products	408	2,800	W	17	2,400	12,000
Plaster and gunite sands	—	—	—	—	11	70
Concrete (blocks, brick, etc.)	—	—	W	(?)	227	1,330
Asphaltic concrete aggregates and road base materials ³	W	W	W	W	2,590	6,980
Snow and ice control	W	W	W	W	89	306
Other miscellaneous uses ⁴	—	—	—	—	119	547
Unspecified: ⁵						
Actual	42	231	12	77	1,440	5,740
Estimated	—	—	19	53	176	803
Total	755	4,550	250	1,060	7,050	27,800

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

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

²Less than 1/2 unit.

³Includes fill.

⁴Includes filtration.

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



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