

THE MINERAL INDUSTRY OF GEORGIA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Georgia Geologic Survey for collecting information on all nonfuel minerals.

In 1999, the preliminary estimated value¹ of nonfuel mineral production for Georgia was \$1.84 billion, according to the U.S. Geological Survey (USGS). This was about a 7% increase from that of 1998,² following a 2.4% increase from 1997 to 1998. The State rose in rank to fifth from seventh among the 50 States in total nonfuel mineral production value, of which Georgia accounted for more than 4.5% of the U.S. total.

Georgia was by far the leading clay-producing State in the Nation, accounting for about 26% of total U.S. clay production. Kaolin remained the State's foremost nonfuel mineral commodity in 1999, accounting for almost 58% of Georgia's estimated total nonfuel mineral value and, of that, about 93% of its clay value; crushed stone was second, accounting for more than 26% of Georgia's nonfuel mineral value. In 1999, nearly all nonfuel mineral commodities increased in value, led by a \$62 million, or 6%, increase in the value of kaolin and a \$43 million, or nearly 10%, increase in the value of crushed stone. Smaller yet significant increases (listed largest to smallest) occurred in construction sand and gravel, dimension stone, and portland cement; only barite, common clays, and fuller's earth showed decreased values, all of which were relatively small. In 1998, increases in kaolin, crushed stone, fuller's earth, and masonry cement led the State's increase in value; only common clay, down \$6.1 million, showed any significant decrease in value for the year (table 1).

Based upon USGS estimates of the quantities produced in the United States during 1999, Georgia remained first among the 50 States in kaolin and fuller's earth; second in crude mica and second of two barite-producing States; third in iron oxide pigments; fourth in crushed stone, common clays, and feldspar; and ninth in masonry cement. Georgia rose to third from fifth in the production of dimension stone. Additionally, the State was a significant producer of portland cement and industrial sand and gravel.

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon 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 1999 USGS mineral production data published in this chapter are preliminary estimates as of May 2000, and are expected to change. For some mineral 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. A telephone listing for the specialists may be retrieved over the Internet at <http://minerals.usgs.gov/minerals/contacts/comdir.html>; by using MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset (request Document #1000 for a telephone listing of all mineral commodity specialists); or by calling USGS information at (703) 648-4000 for the specialist's name and number. All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at <http://minerals.usgs.gov/minerals>; facsimile copies may be obtained from MINES FaxBack.

²Values, percentage calculations, and rankings for 1998 may vary from the *Minerals Yearbook, Area Reports: Domestic 1998, Volume II*, owing to the revision of preliminary 1998 to final 1998 data. Data for 1999 are preliminary and expected to change, while related rankings may also be subject to change.

The following narrative information was provided by the Georgia Geologic Survey,³ in cooperation with representatives of Elberton Granite Association, the Georgia Mining Association, and the Georgia Crushed Stone Association. The industrial rocks and minerals mined in Georgia reflect the geologic diversity of the State's four major physiographic provinces. In the Valley and Ridge Province, limestones and shales are used for aggregate, portland cement, common brick, and floor tile manufacture. In addition, slate is crushed for aggregate and filler. Barite and iron oxide pigments (ochre and umber) are mined from weathered dolomitic rocks in the Cartersville District. In the Blue Ridge and Piedmont Provinces, igneous and metamorphic rocks (mostly gneiss and granite) are extensively mined for crushed and dimension stone as well as for feldspar, marble, scrap mica, and residual clay (for brick and portland cement.) Kyanite has been previously mined in these provinces. Sedimentary strata of the Coastal Plain province contain most of Georgia's various clay resources (common clay, fuller's earth, and kaolin), construction and industrial sand and gravel, and soft limestone (for aggregate and cement). Pleistocene barrier island sands in southeast Georgia have been mined for heavy minerals (ilmenite, leucoxene, monazite, rutile, and zircon). Throughout the State, local alluvial sand and gravel deposits are mined for aggregate.

Georgia's industrial minerals industry is dominated by kaolin, which in 1998 accounted for more than one-half of production value. Nearly all of the kaolin is mined in the Georgia Kaolin District. Approximately 72% of production is for coating and filling in paper manufacture. The remainder is used in the manufacture of various glass and ceramic products, and as fillers, extenders, and binders in adhesives, paints, plastics, and rubber. Leading kaolin producers are Imerys (formerly Imetal SA, France), Engelhard Corp., Thiele Kaolin Co., and J.M. Huber Corp.

In 1999, Imerys purchased most of ECC International Ltd., one of Georgia's leading kaolin producers. J.M. Huber acquired the remainder of ECC. Global Industrial Technologies Inc. acquired A.P. Green Industries Inc., and United Catalysts Inc. purchased Evans Clay Co.

The kaolin industry employs approximately 4,200 mine and plant personnel plus an additional 3,000 contractors. Kaolin exports increased by 2%, and kaolin was the leading export commodity out of the port of Savannah in 1998. Overall, the industry is strong; however, prospects for future growth are limited due to 1%-growth worldwide in recent years and widespread overcapacity of paper plants (which consume nearly 80% of all kaolin). Georgia kaolin faces increasing competition in many foreign markets. For example, Brazilian kaolin represents strong competition in European markets and is now being imported into North America.

³Bruce J. O'Connor, Principal Geologist, authored the text of mineral industry information submitted by the Georgia Geologic Survey.

The crushed stone industry opened five new quarries and shipped a record high of approximately 70 million metric tons of crushed stone. A 70% increase in Federal funding (to \$1 billion per year) for Georgia highway construction may fuel increased highway construction, which accounts for the largest portion of the crushed stone market. Air quality problems in the 13-county metropolitan Atlanta area have resulted in a moratorium on new highway construction and improvements. This limitation is offset by the significant increase in consumption that is anticipated outside the Atlanta region due to the Governor's program of rural highway improvement. As a result, crushed stone production in 2000 is expected to be similar to 1999.

The major crushed stone companies in the State are Hanson Building Materials America, Martin Marietta Aggregates, Vulcan Materials Co., and Blue Circle Aggregates Inc. In 1999, Vulcan acquired Colwell Construction Co., Inc., which operated three quarries in the Blue Ridge Province. In addition, all of the quarries operated by Benchmark Materials (a subsidiary of Beazer PLC), including those formerly owned by Davidson Mineral Properties and Stone Man, Inc. were consolidated into Hanson.

Georgia's dimension granite industry is concentrated in the Elberton District. During 1998, there were approximately 44 active quarries producing monument-grade granite. The industry employs approximately 2,400 individuals, including a quarry work force of 280. In 1998, the total industry payroll was \$53.9 million, while the quarry payroll was \$6.8 million.

Local sales of granite were stable in 1998, and demand for curbing stone for markets in the northeastern United States continued to be very strong. Sales to Pacific Rim markets

declined substantially due to new domination by nearly identical stone from China. The major dimension stone companies are Star Granite Co., Keystone Memorials Co., Central Granite Co., and Georgia Structural Stone Inc. In 1999, two Georgia quarries owned by Georgia Stone Industries Inc. were purchased by Georgia Structural Stone. Keystone purchased the Georgia quarries from Rock of Ages Corp.

Two distinct types of fuller's earth clay are mined in the Coastal Plain Province. Attapulgite (palygorskite-sepiolite) clay is mined in the Meigs-Attapulgus District, and montmorillonite clay is mined in the area of the Georgia Kaolin District. The clay is used for absorbents (including pet litter), petroleum cracking catalysts, paints, pharmaceuticals, carriers for various chemicals, drilling mud, and portland cement manufacture. Principal producers are A & M Products and Oil-Dry Corp.

World class deposits of high-quality marble are in the Tate District north of Atlanta. The area produces dimension stone for the monument and decorative stone market, crushed stone for aggregate, and ground high-purity, high-calcium marble for various filler and extender applications. In 1999, Imerys acquired Georgia Marble Co., which had dominated the marble industry in Georgia for decades.

Mining in Georgia is regulated at the State level by the Department of Natural Resources, Environmental Protection Division. Permitting is a one-stop process that covers all air emission, water quality, and mine reclamation issues. Public concern is increasingly focused on airborne dust as well as surface- and ground water pollution. As a result, new crushed stone quarries, for example, require paved haul roads and crusher enclosures to meet dust emission standards.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

| Mineral | 1997 | | 1998 | | 1999 p/ | |
|---|-----------|--------------|----------|-----------|----------|-----------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Clays: | | | | | | |
| Common | 1,820 | 11,600 | 1,650 | 5,470 | 1,660 | 5,330 |
| Fuller's earth | 576 | 70,500 | 686 | 74,800 | 684 | 74,300 |
| Kaolin | 8,200 | 977,000 | 8,350 | 998,000 | 8,590 | 1,060,000 |
| Gemstones | NA | 8 | NA | 8 | NA | 8 |
| Sand and gravel: | | | | | | |
| Construction | 6,410 | 24,600 | 7,130 | 29,500 | 8,500 | 36,000 |
| Industrial | 520 | 9,330 | 608 | 10,900 | 609 | 11,100 |
| Stone: | | | | | | |
| Crushed 3/ Dimension metric tons | 65,600 r/ | 431,000 r/ | 74,200 | 440,000 | 79,500 | 483,000 |
| | 65,800 3/ | 8,480 3/ | 72,100 | 8,790 | 73,700 | 11,900 |
| Combined values of barite, cement, feldspar, iron oxide pigments (crude), lime, mica (crude), stone [crushed marble, dimension marble (1997)] | | | | | | |
| Total | XX | 1,680,000 r/ | XX | 1,720,000 | XX | 1,840,000 |

p/ Preliminary. r/ Revised. NA Not available. XX Not applicable.

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

2/ Data are rounded to no more than three significant digits; may not add to totals shown.

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

TABLE 2
 GEORGIA: CRUSHED STONE SOLD OR USED, BY KIND 1/

| Kind | 1997 | | | | 1998 | | | |
|------------------|--------------------|---------------------------------|-------------------|------------|--------------------|---------------------------------|-------------------|------------|
| | Number of quarries | Quantity (thousand metric tons) | Value (thousands) | Unit value | Number of quarries | Quantity (thousand metric tons) | Value (thousands) | Unit value |
| Limestone | 29 r/ | W | W | \$6.31 r/ | 31 | W | W | \$6.32 |
| Dolomite | 1 | W | W | 5.50 r/ | 1 | W | W | 5.50 |
| Granite | 44 | 47,600 r/ | \$316,000 r/ | 6.63 r/ | 52 | 56,100 | \$326,000 | 5.82 |
| Marble | 7 | (2/) | (2/) | (2/) | 10 | (2/) | (2/) | (2/) |
| Quartzite | 1 | W | W | 7.31 | 2 | W | W | 3.86 |
| Total or average | XX | 65,600 r/ | 431,000 r/ | 6.57 r/ | XX | 74,200 | 440,000 | 5.93 |

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

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Excluded from total to avoid disclosing company proprietary data.

TABLE 3
 GEORGIA: CRUSHED STONE SOLD OR USED BY PRODUCERS
 IN 1998, BY USE 1/ 2/

| Use | Quantity (thousand metric tons) | Value (thousands) | Unit value |
|---|---------------------------------|-------------------|------------|
| Coarse aggregate (+1 1/2 inch): | | | |
| Riprap and jetty stone | 459 | \$53.90 | \$11.73 |
| Filter stone | W | W | 8.64 |
| Other coarse aggregate | 109 | 360 | 3.30 |
| Coarse aggregate, graded: | | | |
| Concrete aggregate, coarse | 9,510 | 55,500 | 5.83 |
| Bituminous aggregate, coarse | 5,700 | 38,600 | 6.77 |
| Bituminous surface-treatment aggregate | W | W | 8.03 |
| Railroad ballast | W | W | 4.41 |
| Other graded coarse aggregate | 6,150 | 47,600 | 7.74 |
| Fine aggregate (-3/8 inch): | | | |
| Stone sand, concrete | 3,310 | 17,900 | 5.41 |
| Stone sand, bituminous mix or seal | W | W | 5.56 |
| Screening, undesignated | 1,280 | 4,330 | 3.39 |
| Other fine aggregate | 242 | 1,130 | 4.65 |
| Coarse and fine aggregates: | | | |
| Graded road base or subbase | 5,900 | 24,800 | 4.21 |
| Crusher run or fill or waste | 7,030 | 40,200 | 5.72 |
| Other construction materials | 343 | 1,140 | 3.31 |
| Agricultural: Agricultural limestone | W | W | 8.76 |
| Chemical and metallurgical: Cement manufacture | W | W | 5.44 |
| Special: Other fillers or extenders | W | W | 19.29 |
| Other miscellaneous uses: Other specified uses not listed | 4 | 17 | 4.27 |
| Unspecified: 3/ | | | |
| Actual | 28,000 | 163,000 | 5.82 |
| Estimated | 985 | 5,490 | 5.57 |
| Total or average | 74,200 | 440,000 | 5.93 |

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

1/ Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

2/ Includes dolomite, granite, limestone, and quartzite; excludes marble from total to avoid disclosing company proprietary data.

3/ Reported and estimated production without a breakdown by end use.

TABLE 4
 GEORGIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1998, BY USE AND DISTRICT 1/ 2/

(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) 3/ | 256 | 1,780 | 820 | 8,320 | W | W |
| Coarse aggregate, graded 4/ | 6,030 | 35,700 | 14,600 | 101,000 | W | W |
| Fine aggregate (-3/8 inch) 5/ | 1,870 | 9,060 | 4,530 | 23,600 | W | W |
| Coarse and fine aggregate 6/ | 3,350 | 15,400 | 9,230 | 48,000 | W | W |
| Other construction materials | 339 | 1,120 | 4 | 13 | 2,190 | 11,800 |
| Agricultural 7/ | (8/) | (8/) | (8/) | (8/) | -- | -- |
| Chemical and metallurgical 9/ | (8/) | (8/) | (8/) | (8/) | (8/) | (8/) |
| Special 10/ | (8/) | (8/) | (8/) | (8/) | (8/) | (8/) |
| Other miscellaneous uses | -- | -- | 4 | 17 | -- | -- |
| Unspecified: 11/ | | | | | | |
| Actual | 9,540 | 56,400 | 4,420 | 27,400 | 14,100 | 79,500 |
| Estimated | 955 | 5,310 | -- | -- | W | W |
| Total or average | 23,400 | 136,000 | 33,600 | 208,000 | 17,200 | 96,100 |

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

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Excludes marble from total to avoid disclosing company proprietary data.

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

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

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

6/ Includes graded road base or subbase and crusher run (select material or fill).

7/ Includes agricultural limestone.

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

9/ Includes cement manufacture.

10/ Includes other fillers or extenders.

11/ Reported and estimated production without a breakdown by end use.

TABLE 5
 GEORGIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,
 BY MAJOR USE CATEGORY 1/

| Use | Quantity (thousand metric tons) | Value (thousands) | Unit value |
|---|---------------------------------------|----------------------|---------------|
| Concrete aggregate | 2,320 | \$9,600 | \$4.13 |
| Plaster and gunite sands | 601 | 2,760 | 4.60 |
| Concrete products (blocks, bricks, pipe, decorative, etc.) | 109 | 524 | 4.81 |
| Asphaltic concrete aggregates and other bituminous mixtures | 17 | 37 | 2.31 |
| Fill | 98 | 255 | 2.60 |
| Other miscellaneous uses 2/ | 281 | 1,580 | 5.62 |
| Unspecified: 3/ | | | |
| Actual | 1,650 | 5,990 | 3.63 |
| Estimated | 2,050 | 8,790 | 4.29 |
| Total or average | 7,130 | 29,500 | 4.14 |

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Includes road base and coverings.

3/ Reported and estimated production without a breakdown by end use.

TABLE 6
 GEORGIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,
 BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

| Use | Districts 1 and 2 | | District 3 | |
|---|-------------------|-------|------------|--------|
| | Quantity | Value | Quantity | Value |
| Concrete aggregate | 473 | 2,560 | 1,850 | 7,030 |
| Plaster and gunitite sands | W | W | W | W |
| Concrete products (blocks, bricks, pipe, decorative, etc.) | -- | -- | 109 | 524 |
| Asphaltic concrete aggregates and other bituminous mixtures | -- | -- | 17 | 37 |
| Road base and coverings 2/ | W | W | W | W |
| Other miscellaneous uses | 90 | 741 | 2,440 | 9,520 |
| Unspecified: 3/ | | | | |
| Actual | 111 | 354 | 1,540 | 5,630 |
| Estimated | 456 | 2,510 | 1,590 | 6,280 |
| Total | 1,130 | 6,170 | 7,550 | 29,000 |

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

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Includes fill.

3/ Reported and estimated production without a breakdown by end use.