

THE MINERAL INDUSTRY OF GEORGIA

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 Georgia Geologic Survey, Environmental Protection Division, Georgia Department of Natural Resources, for collecting information on all nonfuel minerals.

By Steve W. Sikich¹ and Bruce J. O'Connor²

Statistics released by the U.S. Bureau of Mines (USBM), Department of the Interior, indicate that the value of nonfuel minerals produced in Georgia in 1992 increased 3.1% from a revised³ \$1.31 billion in 1991 to \$1.35 billion. The increase marked the 11th time in 12 years that Georgia's mineral production was greater than that in the previous year. The only year in which a decrease occurred was 1991. However, the mineral value in 1992 was 10.5% less than the alltime record high achieved in 1990.⁴

The State's two leading commodities, clays and crushed stone, accounted for more than 90% of the total value of minerals produced. Both increased in

value from those in 1991 as follows: clay by 2.2%, from \$949.7 million to 970.9 million, and crushed stone by 9.6%, from \$222.9 million to \$244.2 million. Other mineral commodities that increased in value in 1992 were gemstones, construction sand and gravel, and four commodities for which data were withheld to protect company proprietary information. The only minerals decreasing in value from 1991 to 1992 were dimension stone and two commodities for which data were withheld.

Despite the increase in its mineral production, Georgia dropped from sixth in 1991 to eighth in the total value of minerals produced, but retained its

ranking of third in industrial minerals. The State accounted for 4.21% of the total value of minerals produced in the country in 1992. Georgia continued to lead the Nation in the quantity and value of total clays mined, as well as three specific types of clays—kaolin, fire clay, and fuller's earth. The State also led in the quantity of granite dimension stone quarried and regained its number one ranking in the value of barite mined. Georgia ranked second in the production of natural iron oxide pigments sold. Except for the recreational panning of gold, no metals were mined in Georgia in 1992.

TABLE 1
NONFUEL MINERAL PRODUCTION IN GEORGIA¹

Mineral	1990		1991		1992	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays metric tons	9,855,248	\$1,060,539	9,518,026	\$949,737	² 8,962,374	² \$970,905
Gemstones	NA	20	NA	10	NA	645
Sand and gravel:						
Construction thousand short tons	⁴ 4,827	¹ 15,577	⁴ 4,700	¹ 14,500	4,860	15,581
Industrial do.	W	W	W	W	588	8,783
Stone:						
Crushed do.	⁵ 53,000	³ 317,300	³ 41,339	² 222,900	³ 44,000	³ 244,200
Dimension ² short tons	¹ 200,531	¹ 20,451	² 216,938	² 21,282	¹ 159,093	¹ 13,138
Combined value of barite, bauxite (1991-92), cement, clays [fire (1992)], feldspar, iron oxide pigments (crude), mica (scrap), peat (1990), stone [crushed marl, marble and other (1991-92), dimension marble], talc and pyrophyllite (1990), and values indicated by symbol W						
	XX	⁹ 90,164	XX	97,307	XX	93,002
Total	XX	¹ 1,504,051	XX	¹ 1,305,736	XX	1,346,254

⁴Estimated. ²Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

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

²Excludes certain clays; kind and value included with "Combined value" data.

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

TRENDS AND DEVELOPMENTS

The increase in the value of Georgia's mineral economy from 1991 to 1992 suggests a recovery from the recession that impacted the State. However, its failure to rebound to anywhere near the record level of 1990 suggests the recovery was constrained and that full recovery may take several years. Georgia experienced an 11% growth in construction spending in 1992. Permits for building construction totaled \$6.7 billion, which included \$4.3 billion in new residential construction, including hotels; \$1.2 billion in new nonresidential construction; and \$1.2 billion in additions and alterations.

Revenue at Georgia's ports continued to increase to record-high levels. The Port of Savannah set a new record for total containerized cargo in fiscal year 1992, handling 3.8 million short tons, while the container volume of 20-foot equivalent units rose to 498,432. Total exports from Georgia were valued at \$8.1 billion. To accommodate the newest and largest vessels now afloat or planned, the Georgia Ports Authority plans to spend more than \$300 million during the decade of the 1990's to upgrade and expand the ports' facilities. The upgrading and expansion began with two projects that have been completed. A new bridge, completed in 1991, was constructed across the Savannah River to raise the vertical clearance to 185 feet. In 1992, a 5.6-mile stretch of the Savannah River channel was widened from 400 feet to 500 feet. Work on deepening the channel was scheduled to begin in early 1993.

The Governors of Alabama, Florida, and Georgia opened 1992 by signing an agreement on January 3 that established a partnership to study interstate water issues. The States have been in disagreement since 1990 when Georgia announced plans to divert water from the Coosa and Chattahoochee Rivers to serve the growing Atlanta area. Alabama filed suit in U.S. District Court to prevent the U.S. Army Corps of Engineers (Corps) from guaranteeing Georgia right to the

water. The agreement calls for a \$3 million study funded by the three States and the Corps to study the States' shared water resources, specifically the Alabama-Coosa-Tallapoosa and the Apalachicola-Chattahoochee-Flint river basins. The Corps will terminate a plan to divert water from rivers flowing into Alabama and Florida to meet the needs of Atlanta and north Georgia. Alabama will ask the Federal court to stop all action on its lawsuit. States, cities, and businesses will continue to use water at current rates and will notify the other States if an increase is needed. Finally, the three States and the Corps will continue negotiating and exchanging information about the region's water needs.

Construction-material industry officials expect large-scale acquisitions by foreign companies, such as the Hanson PLC purchase of Beazer PLC in 1991, to slacken in the remainder of the decade. Divestitures of some of the acquisitions made in the 1980's and early 1990's can be expected as the construction industry continues to endure a slow-growth market. Smaller companies will continue to be available for acquisition as the result of costs and time required for compliance with government regulations, decreasing availability of permitted reserves, expected slow-growth of the economy, and decreased opportunities for internal or family selling alternatives. Companies in rural areas are expected to consolidate to lessen competition and increase profits.

The aforementioned expectations appeared to be supported in Georgia as the rate of major corporate changes and takeovers that highlighted mineral industry activity for the past decade slackened in 1992. However, several relatively small transactions did occur. Coggins Granite Inc., Elberton, was acquired by Swenson Granite Co., Concord, NH. Kemira Inc., the Savannah-based subsidiary of Finland's Kemira Oy, signed a letter of intent to purchase a 20% interest in Nord Kaolin Co. based in Jeffersonville, Twiggs County. New plants and plant expansions also occurred at a slower pace. Kemira announced plans to construct an \$18

million research and development center at its Savannah plant. Expansions were completed by Albion Kaolin Co., Hephzibah; ECC International Inc., Sandersville; and Southern Granite Co. Inc., Elberton.

EMPLOYMENT

Based upon statistics supplied by the U.S. Department of Labor,⁵ employment in Georgia's mining sector decreased from 7,700 in 1991 to 7,500 in 1992, a drop of 2.6%. The Mine Safety and Health Administration reported⁶ a somewhat lower total number of workers (7,296) employed in the mining industry in 1992, of which 53 were employed in an underground crushed stone mine, 3,965 in nonmetal surface mines, and 5,274 in mills and preparation plants. One fatal minerals-related accident occurred in a preparation plant in Georgia in 1992.

The average salary of mine workers in Georgia increased 6.8%, from \$31,466 in 1991 to \$33,606. The 1992 salary averaged 23.6% less than the national average of \$41,535 for mine workers, but was 37.1% higher than the average pay of \$24,517 for nonfarm workers in Georgia. The only Georgia workers with a higher average pay were transportation, communications, and public utility workers who averaged \$35,819 annually and wholesale trade workers who averaged \$34,759.

ENVIRONMENTAL ISSUES

The Hazardous Waste Management Program of the Georgia Environmental Protection Division (EPD) was split from the Land Protection Branch, effective February 1. The new Hazardous Waste Management Branch will be responsible for the following programs: Generator Compliance, Facilities Compliance, Corrective Action, and Criminal Investigation. On July 1, responsibility for portions of the Erosion and Sedimentation Control Program were transferred from the Land Protection Branch to the Water Protection Branch. Duties related to issuing permits and

reviewing local programs transferred to Water Protection. Inspection and enforcement functions remained in Land Protection.

A new 10-year plan proposed by the Georgia Geologic Survey (GGS) emphasized a shift from mineral and academic studies to environmental technical investigations and regulatory support. The Accelerated Economic Minerals Program was terminated, and other geologic mapping and mineral studies were canceled.

GGS received an \$800,000 grant from the U.S. Department of Energy to assess tritium pollution in ground water. Tritium had been detected in several Coastal Plain wells in Georgia across the Savannah River from the Savannah River Site. GGS will assess the occurrences and attempt to determine the extent of tritium pollution, present and future health risks, and the possible pathway the tritium may have followed to the State's ground water.

In July, the U.S. Environmental Protection Agency (EPA) proposed a 300-picocurie-per-liter (1-millionth of 1-millionth of a curie) limit on radon in public water systems to reduce radon in homes. Although the radon contained in the water is considered safe to drink, radon is released into the air when the water is agitated. State officials estimated that 98% of Georgia's 1,400 water systems exceed the proposed limit and suggested a 1,000-picocurie limit would be more reasonable. Small water systems that are unable to borrow money or do not qualify for grant and loan programs will be hard pressed to meet the requirement. They cannot afford radon removal systems nor the cost of the power to run them or to test for the gas.

An administrative law judge with the Department of Natural Resources (DNR) issued an order overturning a decision by the EPD to deny a mining permit based on the historical significance of an adjoining property. The judge ruled that DNR misinterpreted the law when it ruled that the mined land use plan was not compatible with land use in the area. In the order, he stated that the land use consistency requirement is applicable only

to postmining activities.

In April, NL Industries agreed to pay EPA \$42,000 of the \$88,000 the Government agency spent on overseeing the cleanup of the National Smelting and Refining Superfund site in Atlanta. NL spent more than \$500,000 to remove process chemicals and lead-contaminated soil from the site.

New legislation requiring scrap recyclers to keep records of all purchases of nonferrous metals was enacted in April. The legislation was designed to reduce the theft of metal that ranges from brass fittings and copper wire to aluminum bridge railings and stocks of used beverage cans. Among the most common victims are scrap metal dealers and processors, utilities, municipalities, and private companies such as building contractors and mining companies. The inability to identify the material as stolen is a major problem police face in combating metal thefts.

GNB Inc., St. Paul, MN, announced plans for a new secondary lead smelter in Waynesboro, Burke County, GA. Company officials declared that the smelter, expected to be completed in early 1994, will offer an environmentally acceptable alternative to the incineration of lead-acid batteries. They also criticized EPA's 1989 decision to drop its ban on incinerating batteries, contending that smelting batteries is an environmentally superior method of disposing of the batteries and has the added advantage of recovering the lead. The new plant is designed to recycle 9 million batteries annually. GNB's existing smelter at Columbus will be phased out when the Waynesboro smelter becomes operational. However, new batteries will continue to be manufactured at the Columbus site.

The Georgia Mining Association sponsored an environmental workshop in August. In the keynote address, the director of EPD complimented Georgia's mining industry on the positive role it had played in improving the State's environmental welfare and noted that EPD had received only three mining-related complaints the previous year. The workshop offered sessions on

hydrogeology and well placement, sediment basin construction and design, and an update on wetlands legislative issues. Also discussed were the Hazardous Site Response Act, the Comprehensive Solid Waste Management Act, landfill siting and permitting, and Clean Air Act issues.

EXPLORATION ACTIVITIES

Exploration for gold and other minerals continued to be severely restricted because of low prices and/or oversupply and production capacity. Some development activity was reported at the Franklin-Creighton Gold Mine in Cherokee County. E. I. du Pont de Nemours & Co. purchased 15,400 acres in Charlton County from Union Camp Corp. The site forms an extension to Du Pont's new heavy-mineral sands operation north of Highland in adjoining Florida. Du Pont produces the titanium minerals, ilmenite and leucoxene; the iron-aluminum silicate, staurolite; and the zirconium silicate, zircon, in Florida. After purchasing the property, Du Pont began studies to assess whether or not the minerals can be extracted in an environmentally acceptable manner. The environmental studies are expected to take several years to complete.

The U.S. Geological Survey (USGS) published an open file report on a preliminary geochemical evaluation of potential for platinum deposits in the crystalline rocks of Georgia. The 89-page report, prepared in cooperation with GGS, contains 14 1:100,000 scale maps.

LEGISLATION AND GOVERNMENT PROGRAMS

Funding for the first phase of the Georgia Ports Authority's \$319 million FOCUS 2000 Savannah River channel deepening and landside ports improvements program was approved by the Georgia General Assembly. The \$88 million first phase of FOCUS 2000 includes funds for deepening the Port of Savannah channel from 38 feet to 42 feet, completion of an existing container berth,

additional warehousing and storage areas, a container crane upgrade program, and improvements to the Port of Brunswick's Mayor's Point Terminal. The \$43 million channel deepening will allow the port to accommodate the next generation of container ships. Federal reimbursement will be available for part of the project.

The shift in emphasis from economic mineral and academic studies to environmental technical studies and regulatory support was emphasized by the Georgia State Geologist in his annual report to the Association of American State Geologists. He noted that the mission of GGS when it was founded in 1836 was to complete a geological survey of the entire State. The current mission of GGS is to conduct and foster investigations of the State's geologic and hydrologic resources and to make these investigations available to the public. GGS provides technical expertise to other branches of Georgia's EPD by reviewing hydrological assessments of hazardous and municipal waste sites, locating public water supply wells to maximize yield and minimize impact on aquifers, designing aquifers tests to evaluate industrial sites, and assisting with localized ground water contamination problems. GGS also provides technical expertise to other State agencies, such as the Department of Community Affairs, to promote industrial development. In addition, GGS regulates exploration for oil and natural gas, regulates injection wells, administers the Ground Water Management Plan for Georgia, and oversees compliance with the Water Well Standards Act.

Following the reorganization of GGS in 1991, the survey was separated into two programs, Regulatory Support and Technical Assistance. In 1992, the survey employed 33 full-time staff members, of which 28 were geologists. In cooperative programs with USGS, GGS maintained a statewide network of stream gauging stations and observation wells equipped with continuous water-level recorders. GGS also published studies by USGS on the hydrogeology of Georgia.

Engineers from the Tuscaloosa

Research Center, USBM, published studies discussing the modeling of capillary suction time of kaolin slurry based upon Georgia kaolin samples. The model also showed that chemometrics can be used as a tool for prediction of dewatering characteristics.

REVIEW BY NONFUEL MINERAL COMMODITIES

Industrial Minerals

Georgia ranked third nationally both in the value of industrial mineral production and in the variety of industrial mineral commodities mined. Fourteen industrial mineral commodities were mined in 1992; at least eight others were produced from raw materials mined within the State or shipped in. All of the nonfuel mineral commodities produced in Georgia were industrial minerals.

Barite.—Georgia regained its ranking as the leading State in the value of barite produced after losing it to Nevada in 1991. Georgia continued to rank second to Nevada in the quantity of barite mined. Barite was produced near Cartersville, Bartow County, by two companies—Cyprus Industrial Minerals Co. (CIM) and New Riverside Ochre Co. All of the barite mined in 1992 was used by the chemical and the industrial filler and pigments industries.

CIM's barite operations at Cartersville were reported to be for sale at yearend. CIM was once a leading international producer of industrial minerals that included barite, calcium carbonate, kaolin and ball clay, crushed stone, and talc. However, in the past 5 years, CIM's parent, Cyprus Minerals Co., has sold all of its subsidiary's industrial minerals operations with the exception of the Cartersville barite operation. Georgia operations formerly owned by CIM included a kaolin operation at Sandersville, Washington County, that was sold to Kentucky-Tennessee Clay Co. in 1987 and a calcium carbonate processing facility at Cartersville that was sold to ECC International in 1988.

Bauxite.—Bauxite production increased significantly over that reported in 1991, but overall output continued to be relatively small. Georgia continued to rank second, behind Alabama, as one of the two States in which bauxite was mined in 1992. Production data were withheld because bauxite was mined by only one company in Sumter County, Mullite Co. of America (Mulcoa), a subsidiary of France's Imetal. The bauxite was blended with bauxitic kaolin to manufacture Mulcoa's highest grade of synthetic mullite, "Mulcoa 70," which has an alumina content of 70%. Georgia was the Nation's leader in the manufacture of synthetic mullite, accounting for 89% of the quantity produced and 65% of its associated value in 1992.

Cement.—Georgia ranked 10th in the quantity of masonry cement manufactured in 1992 and 9th in its attendant value. In the manufacture of portland cement, its respective rankings were 22d in quantity and 24th in value. In 1991, Georgia ranked 11th in quantity and 10th in value of masonry cement and 19th in quantity and 20th in value of portland cement. Masonry cement was produced in 36 States, and portland cement was produced in 39 States. Blue Circle Inc. in Atlanta and Medusa Cement Co. in Clinchfield, Houston County, produced both masonry and portland cement.

Clays.—Clay production in Georgia totaled 8.96 million metric tons, a decrease of 5.8% from that of 1991. The value of clays produced showed an increase of 2.2% to \$970.9 million. The principal factor causing the reduction in quantity and the modest increase in price was the reclassification of certain types of kaolin to fire clay. The kaolin was included in the published clay data in 1991, but the fire clay was excluded from the published clay totals in 1992. Georgia once again led the Nation in both the volume and the value of clays produced. Four types of clays, common clay, fire clay, fuller's earth, and kaolin, were mined in 17 of Georgia's 159

TABLE 2
**GEORGIA: FULLER'S EARTH SOLD OR USED BY PRODUCERS,
 BY KIND**

(Thousand metric tons and thousand dollars)

State	Attapulgitic		Montmorillonite		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
1989	894	85,052	988	80,643	1,882	165,695
1990	745	95,171	1,563	128,475	2,308	223,646
1991	*509	*63,273	*108	*13,134	*617	*76,407
1992	591	76,665	(¹)	(¹)	591	76,665

*Revised.

¹Included under attapulgitic.

TABLE 3
GEORGIA: KAOLIN SOLD OR USED BY PRODUCERS, BY COUNTY

(Thousand metric tons and thousand dollars)

County	1992		
	No. of mines	Quantity	Value
Richmond ¹	7	345	10,179
Twiggs	15	1,806	253,300
Washington	10	1,244	159,165
Wilkinson	10	850	119,967
Other ²	52	2,643	336,317
Total	94	6,888	878,928

¹Includes Jefferson County.

²Includes Columbia, Houston, Sumter, Various, and Warren County.

counties. There was no production of ball clay or bentonite reported to the USBM.

Common Clay and/or Shale.—The value of common clays reported to the USBM increased 46.3% to \$15.3 million in 1992. This followed a 49.2% increase to \$10.5 million in 1991. Common clay was valued at \$7 million in 1990. The principal reason for the phenomenal increase was a reported increase in the value of common clay used for brick manufacture by a Bibb County producer, from \$4.63 per short ton in 1990 to \$45.59 per ton in 1991 to \$67.98 per ton in 1992. Production increased 7.4%, from 1.38 million metric tons in 1991 to 1.48 million tons in 1992. As a result of the changes, Georgia's national ranking rose from fourth in 1990 to third in 1991 to first in 1992 in value of common clays produced. The corresponding rankings in

quantity produced dropped from fourth in 1990 to eighth in 1991 and then rose to sixth in 1992.

Common clay production was reported by 8 companies from 12 operations and 12 pits in 7 counties. It was used in common and face brick; portland cement; flue linings; floor, wall, and ceramic tile; and quarry tile. The leading producers, in order of volume, were Boral Bricks Inc., Bibb and Richmond Counties; Blue Circle Inc., Douglas and Fulton Counties; Bickerstaff Clay Products Co., Columbus and Floyd Counties; General Shale Products Corp., Floyd and Fulton Counties; and Cherokee Brick and Tile Co., Bibb County.

Fire Clay.—Fire clay production was reported for the first time in Georgia in 1992. This resulted from the reclassification of kaolin produced by two companies to the fire clay category based

on mineralogy and end-use applications. Fire clay production was reported by Mulcoa in Sumter County for calcine and by Georgia Vitrified Brick and Clay Co. Ltd. in Harlem, Richmond County for fire brick and flue lining.

Fuller's Earth.—Clays included in the fuller's earth category included attapulgitic mined by Engelhard Corp. and Milwhite Co. Inc. in Decatur County and by Oil Dri Corp. of America and Waverly Minerals Products Co. in Thomas County. Clays classified as montmorillonite were mined by the Georgia-Tennessee Mining and Chemical Co. in Jefferson County, Medusa Cement Co. in Houston County, and by Floridan Co. and Waverly in Thomas County.

The volume of fuller's earth produced decreased from a revised total of 617,000 metric tons in 1991 to 591,000 tons in 1992, although the value increased from \$76.4 million to \$76.7 million. Georgia's share of all the fuller's earth produced in the United States increased from 22.5% in 1991 to 24.5% in 1992. The corresponding value increased from 28.3% to 31.7%.

Principal uses of fuller's earth, which accounted for more than 80% of the volume produced, were in the manufacturing of pet waste absorbents, oil and grease absorbents, and pesticide carriers. Other uses included fertilizers; drilling mud; cement; paint; filtering, clarifying, and decolorizing agents; and as a catalyst in oil refining.

Kaolin.—Georgia continued to rank as the principal producer of high-grade kaolin products both domestically and worldwide. In 1992, the State accounted for 85.4% of national production and more than 32% of the world's estimated production. The State's kaolin production dropped 8.4%, from 7.52 million metric tons in 1991 to 6.89 million tons in 1992. The value of kaolin increased 1.9%, from \$862.9 million in 1991 to \$878.9 million in 1992, as the result of a unit value increase from \$123.93 per metric ton in 1991 to \$127.61 per ton in 1992.

Kaolin production was reported by 14 companies at 89 pits in 9 counties. Table

TABLE 4
GEORGIA: KAOLIN SOLD OR USED BY PRODUCERS, BY USE

(Thousand metric tons)

Use	1991				1992			
	Air-float	Unprocessed ¹	Water-washed ²	Total ³	Air-float	Unprocessed ¹	Water-washed ²	Total ³
Domestic:								
Adhesives	W	—	26	26	30	—	28	58
Aluminum sulfate and other chemicals	—	W	—	W	—	W	—	W
Asphalt tile and linoleum	W	W	—	W	W	W	—	W
Catalysts (oil-refining)	W	—	35	35	W	—	45	45
Face brick	—	4	—	4	—	4	—	4
Fiberglass and mineral wool	223	—	W	223	259	W	W	259
Fine china and dinnerware; crockery and earthenware	W	—	W	W	W	—	W	W
Firebrick, blocks and shapes	W	9	—	9	W	—	—	W
Grogs and calcines, refractory	W	W	W	W	W	—	W	W
Medical, pharmaceutical, cosmetic	W	—	W	W	W	—	W	W
Paint	W	—	200	200	W	—	199	199
Paper coating	—	—	2,604	2,604	—	—	2,675	2,675
Paper filling	147	—	905	1,052	W	W	1,059	1,059
Plastics	W	—	50	50	W	—	30	30
Pottery	W	—	—	W	W	—	—	W
Refractories ⁴	7	23	8	38	32	8	8	48
Roofing granules	W	W	—	W	W	—	W	W
Rubber	14	—	40	54	25	—	26	51
Sanitaryware	33	—	—	33	W	W	W	W
Miscellaneous, air-float:								
Common brick, fertilizers, gypsum products, pesticides and related products, roofing and structural tile, other uses not specified	247	—	—	247	309	—	—	309
Miscellaneous, unprocessed:								
Fertilizers, pesticides and related products, other uses not specified	—	879	—	879	—	173	—	173
Miscellaneous, water-washed:								
Gypsum products, ink, pesticides and related products, waterproofing and sealing, fertilizers, other uses not specified	—	—	185	185	—	—	218	218
Total³	671	915	4,053	5,639	655	185	4,288	5,128
Exports:								
Paint	—	—	W	W	—	—	27	27
Paper coating	—	W	1,321	1,321	—	W	1,358	1,358
Paper filling	—	—	386	386	9	—	191	200
Rubber	—	—	16	16	—	—	17	17
Undistributed	30	44	83	157	20	68	69	157
Total³	30	44	1,805	1,879	29	68	1,662	1,759
Grand total³	702	959	5,858	7,519	685	253	5,950	6,888

W Withheld to avoid disclosing company proprietary data; included in "Undistributed" and/or "Total."

¹Includes high-temperature calcined.

²Includes low-temperature calcined and delaminated.

³Data may not add to totals shown because of independent rounding.

⁴Includes electrical porcelain; floor and wall tile, ceramic; flue linings; glazes, glass, and enamels; high-alumina brick and specialties; kiln furniture; and refractory mortar and cement.

3 summarizes Georgia kaolin sold or used by producers by county. Table 4 contains an abbreviated listing of kaolin sold or used by producers by use. A more complete listing is given in the USBM's 1992 Clays Annual Report, which also contains a breakdown of kaolin exports. Kinds of kaolin sold or used by producers with their quantities produced in metric tons and values in thousand dollars were as follows: water washed, 4,169 tons, \$472,008; calcined, 587 tons, \$226,935; delaminated, 1,257 tons, \$143,031; air-float, 685 tons, \$30,001; and unprocessed, 190 tons, \$6,953. Both low-temperature filler and high-temperature refractory grades were included in the calcined kaolin. The major kaolin producers, in order of quantity produced, were ECC America Inc., Engelhard Corp., Thiele Kaolin Co., and J. M. Huber and Co.

Albion Kaolin Co., a subsidiary of United Catalysts, Louisville, KY, completed its new kaolin slurry plant at Hephzibah, Richmond County. The fully automated facility increased Albion's production capacity to 300,000 short tons per year for the ceramics, refractories, rubber, and paint markets.

Dry Branch Kaolin Co., owned by Asea Brown Boveri, Zurich, Switzerland, formed a subsidiary, Kaopolite Inc., to develop, manufacture, and market new kaolin-based products. One of the company's first products was a chewing gum designed to whiten teeth and help remove plaque. Although the gum cannot be used to replace regular brushing and flossing, tests show that chewing the gum removed up to 30% of plaque. The American Dental Association is conducting tests to determine if its endorsement of the product would be appropriate.

ECC International Inc., a subsidiary of English China Clays PLC, Cornwall, England, continued the staged expansion of its Sandersville, Washington County, operations. Included in the 1992 expansion was the installation of a laboratory cryofilter high-gradient magnetic separator (HGMS). The HGMS has a powerful 6 Tesla (60 kilogauss) superconducting magnet. All facilities

necessary to process clay samples are provided in the unit's compact design. ECC also opened its fifth precipitated calcium carbonate plant in 1992.

Kemira Inc., the Savannah-based subsidiary of Finland's Kemira Oy, signed a letter of intent to purchase a 20% interest in Nord Kaolin Co. based in Jeffersonville, Twiggs County. Closing of the transaction, which was originally scheduled for August 15, was still pending at yearend. The original agreement called for Kemira to retain an option to buy an additional 31% interest in Nord over the next 4 years. Kemira is a producer of titanium oxide pigments with a plant capacity of 145,000 tons of TiO_2 at Savannah. Its interest in Nord is related to the latter's recently developed line of special papermaking pigments, which are essentially composites of kaolin and TiO_2 .

According to published reports,⁷ Nord produces approximately 300,000 tons of kaolin for the paper industry each year. Products include coating, filler, delaminated, and calcined grades of kaolin, 10% of which is exported mainly to Europe and Japan.

Feldspar.—Georgia ranked fifth of six States in both the quantity and value of feldspar produced in 1992. The State's only feldspar producer, The Feldspar Corp., a wholly owned subsidiary of the Zemex Co., operated a high-sodium feldspar mine near Monticello, Jasper County, and a high-potassium feldspar mine near Siloam, Greene County. Ore from the two mines was blended at a froth-flotation plant in Monticello to produce a concentrate used in the manufacture of glass and ceramic products.

Gemstones.—Georgia's ranking in the value of natural gemstones produced rose from 32d in 1991 to 20th in 1992. Gemstone production was reported from all 50 States. Georgia's rise in national ranking appeared to have resulted from a change in the manner in which pearl and mussel-shell producers reported their production. In past years, the mussel

farmers credited all of their production to Tennessee or Arkansas, the States in which they had their major operations. In 1992, they credited their production to the State's from which the mussels were actually harvested.

Iron Oxide Pigments.—Georgia ranked second, behind Missouri, in value and third in the quantity of natural iron oxide pigments produced in 1992. Production was reported from five States. Georgia ranked eighth out of 11 States in both the quantity and value of finished iron oxide pigments manufactured. New Riverside Ochre Co., the State's only producer, mined ochre and umber near Cartersville in Bartow County. Ochre is an orange-yellow mixture of limonite and clay averaging 55% to 65% Fe_2O_3 , with less than 2% MnO_2 oxide. The most valuable ochres average 0.5% MnO_2 and have the brightest yellow color. UMBER has a chocolate-brown color and may contain up to 5% MnO_2 . The deposits occur in residuum developed in the basal part of the Lower Cambrian Shady Dolomite.

Mica.—Nationally, Georgia ranked third in both value and quantity of scrap mica mined in 1992. Scrap mica was produced in five States. Franklin Mineral Products Co. Inc., division of the Mearl Corp., produced flake muscovite from micaceous granite saprolite. It had a mine and wet-grinding plant 1/2 mile west of Hartwell and a second mine 5 miles south of Hartwell, Hart County. Much of the plant's production was used by the parent company to manufacture pearlescent pigments used in plastic coatings and cosmetics.

Sand and Gravel.—Construction.—Construction sand and gravel production is surveyed by the USBM for even-numbered years only; data for odd-numbered years are based on annual company estimates. This chapter contains actual data for 1990 and 1992 and estimates for 1991.

Construction sand and gravel production increased 3.4% to 4.86 million short tons, while its corresponding value

TABLE 5
GEORGIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN
1992, BY MAJOR USE CATEGORY

Use	Quantity (thousand short tons)	Value (thousands)	Value per ton
Concrete aggregates (including concrete sand)	2,331	\$7,646	\$3.28
Plaster and gunite sands	W	W	2.85
Concrete products (blocks, bricks, pipe, decorative, etc.)	95	464	4.88
Asphaltic concrete aggregates and other bituminous mixtures	W	W	2.54
Road base and coverings	24	162	6.75
Fill	W	W	2.17
Unspecified: ¹			
Actual	1,601	4,800	3.00
Estimated	256	1,071	4.18
Total	4,860	15,581	3.21
Total ^{2 3}	4,409	15,581	3.53

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

¹Includes production reported without a breakdown by end use and estimates for nonrespondents.

²One metric ton is equal to 1,000 kilograms or 2,204.62 pounds. To convert short tons into metric tons, multiply short tons by 0.907185.

³Total quantity and total value in thousand metric tons and thousand dollars.

increased 7.5% to \$15.6 million. Although increasing significantly, construction sand and gravel production was barely one-half of that produced in the record-high year of 1988, 9.5 million short tons valued at \$30.2. Georgia ranked 44th in both the quantity and value of construction sand and gravel mined in 1992. Sand and gravel production was reported from all of the contiguous States and Alaska in 1992.

Construction sand and gravel production was reported by 36 companies with 44 operations and 49 pits in 33 counties. The State's leading counties, in order of quantity produced, were Decatur, Talbot, Montgomery, Taylor, McIntosh, and Richmond.

The State's largest producers, in order of quantity produced in 1992, were Atlanta Sand & Supply Co. in Crawford County; Brown Brothers Sand Co. in Talbot County; Southern Aggregates and McIntosh Sand Co., subsidiaries of CSR Corp., in Richmond and McIntosh Counties; Montgomery Sand Co., a subsidiary of Florida Crushed Stone Co., in Brantley, Montgomery, and Pike Counties; and Brown and Watson Inc. in Taylor (two pits) and Talbot Counties.

Industrial.—Industrial sand and gravel

production data were published in 1992 after being withheld in previous years. The quantity produced, 588,000 short tons, was slightly less than that produced in 1991. The value of \$8.8 million was essentially unchanged from the 1991 value. Of the 39 States producing industrial sand and gravel, Georgia ranked 17th (up from 18th in 1991) in quantity and 18th in its corresponding value in 1992.

Industrial sand and gravel production was reported by five companies in 1992. The Morie Co. Inc., the Nation's third largest industrial sand and gravel producer, mined sand near Junction City, Marion County. It operated one pit and a plant producing sand for glass containers, blasting, filtration, traction, molding, and core facing.

Atlanta Sand and Supply Co., operating under the name of Crawford County Mining Co., produced sand for blasting, ground fillers, roofing granules, filtration, traction, and golf courses. It mined from two pits south and southeast of Gaillard, Crawford County. The company also produced construction sand and gravel at the same location. Approximately 6% of its total production was industrial sand and gravel.

The Granite Panelwall Co., a division

of Florida Crushed Stone Co., produced sand for blasting, golf courses, and traction from a Quaternary alluvial sand deposit 1 mile west of Mount Vernon, Montgomery County. The company, under the name Montgomery Sand Co., also produced construction sand and gravel at the same location.

Savannah Abrasives Inc. reported minor production from Chatham County. Sales of byproduct industrial sand from a mica operation in Hart County also were reported.

Major uses of industrial sand and gravel in 1991 were glass containers, flat glass, blasting sand, foundry sand, ground fillers, and filtration sand. The six products accounted for the end use of 90% of the sand produced in Georgia. Flat glass was manufactured using industrial sand as the principal ingredient by PPG Industries at Perry. Glass containers were manufactured by Anchor Glass Co. Inc., Warner Robbins, and Owens-Brockway Inc. and Smith Container Corp., both in Atlanta. Industrial sand was also used in the manufacture of fiber-optic cable by the Fitel Corp., a joint venture of Penn Central Corp. and Furukawa Electric of Japan, at its plant in Carrollton.

Fused silica was produced by Harbison-

TABLE 6
GEORGIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED BY PRODUCERS IN 1992,
BY DISTRICT AND USE

(Thousand short tons and thousand dollars)

Use	District 1 ¹		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products ²	—	—	500	2,092	2,238	6,906
Asphaltic concrete aggregates and other bituminous mixtures	—	—	(³)	(³)	(³)	(³)
Road base and coverings	—	—	—	—	24	162
Fill	—	—	(³)	(³)	(³)	(³)
Unspecified: ⁴						
Actual	—	—	181	582	1,419	4,217
Estimated	—	—	256	1,071	—	—
Total	—	—	952	3,808	3,908	11,773
Total ^{5 6}	—	—	864	3,808	3,545	11,773

¹Withheld to avoid disclosing company proprietary data; included with District 2.

²Includes plaster and gunite sands.

³Withheld to avoid disclosing company proprietary data; included with "Total."

⁴Includes production reported without a breakdown by end use and estimates for nonrespondents.

⁵One metric ton is equal to 1,000 kilograms or 2,204.62 pounds. To convert short tons into metric tons, multiply short tons by 0.907185.

⁶Total quantity and total value in thousand metric tons and thousand dollars.

Walker Refractories Co., a subsidiary of Dresser Industries Inc., at Calhoun and by Leco Corp. at Lawrenceville. Fused or vitreous silica is manufactured by the fusion of very high-grade silica sand in various electric arc and electrical resistance furnace configurations.

Stone.—Crushed.—Stone production is surveyed by the USBM for odd-numbered years only; data for even-numbered years are based on annual company estimates. This chapter contains estimates for 1990 and 1992 and actual data for 1991.

Crushed stone was the second most valuable mineral commodity produced in Georgia again in 1992. Estimated production of crushed stone in Georgia increased 6.4% to 44 million short tons valued at \$244.2 million, a 9.6% increase. Georgia ranked 11th out of 49 States in the quantity and 9th in the value of crushed stone produced in 1992.

The Mine Safety and Health Administration inspected 78 crushed stone quarries operated by 25 companies in 48 of Georgia's 159 counties in 1992. There were 51 granite quarries, 16 limestone quarries, 10 marble quarries, and 2 sandstone quarries. Counties with multiple quarries included Gilmer with

seven, Pickens with five, and Whitfield with four. Five counties had three quarries each and seven had two each.

Companies with the most quarries were Vulcan Materials Co. with 15, Hanson PLC (Davidson Mineral Properties and Stoneman Inc.) with 11, Georgia Marble Co. with 8, Martin-Marietta Aggregates Inc. with 8, Blue Circle Inc. with 7, and Florida Rock Industries Inc. with 6.

EPD granted mining permits to Vulcan Materials Co. and Florida Rock Industries for planned crushed stone quarries in Bartow County. The quarries will provide stone for the new Atlanta outer-belt perimeter highway that will be built through the area. Florida Rock also applied for a permit for a quarry, asphalt plant, and cement batch plant in Jefferson, Jackson County.

Granite was crushed to produce roofing granules by Georgia Stone Quarries from its Banks County quarry and by Blue Circle Aggregates Inc. from quarries at Lithonia, DeKalb County, and Douglasville, Douglas County.

Dimension.—Estimated dimension stone production declined sharply in 1992 after posting large gains in 1990 and 1991. The quantity produced dropped 26.7%,

from a revised figure of 216,938 short tons in 1991 to 159,093 tons in 1992. Correspondingly, the value dropped 38.3%, from \$21.3 million to \$13.1 million. Data for marble dimension stone were not included in the published totals because only one company, Georgia Marble Co., quarried dimension marble.

Georgia continued to lead the Nation in the value of marble dimension stone and in the volume of granite dimension stone quarried. Overall, it ranked second in the volume and third in the value of all dimension stone produced.

The Elberton granite district retained its position as the world's leading producer of granite monuments. In 1992, 101 firms, 33 of which operated quarries, were members of the Elberton Granite Association (EGA).

Southern Granite Co. Inc. completed a 6,000-square-foot expansion of its Elberton finishing plant. Featured in the expansion was the installation of a computer operated, fully automatic milling, grinding, and polishing system capable of producing monuments continuously on a 24-hour schedule, even during overnight hours when no one is working in the plant.

The assets of Coggins Granite Inc. were

acquired by Royalty Granite Corp., a subsidiary of Swenson Granite Co., Concord, NH. Swenson also owns one of the world's largest granite quarrying operations, the Rock of Ages quarry in Barre, Vermont. Coggins was a 72-year-old, family owned granite quarrying operation composed of 12 properties covering 2,800 acres in Elbert, Madison, and Oglethorpe Counties; a quarry in South Carolina; and another in Oklahoma. Included in the Georgia quarries were the Royalty Blue, the Berkeley Blue, the Millstone, and nine idle quarries. A few of the idle quarries may be reopened, but Swenson officials indicated they have no plans to build or purchase a finishing plant in Georgia. Any finishing of blocks quarried in Georgia would be subcontracted to existing processing plants in the Elberton area because the cost of shipping the blocks to Swenson's plants in New England would be prohibitive.

Coggins was founded in 1919 as the Georgia Granite Corp. and grew into a multidimensional producer employing as many as 500 people. Operations included monumental and/or structural granite quarries and plants in Georgia, the Dakotas, Oklahoma, the Carolinas, and Virginia. The company was a leader in the introduction of innovative technology in both quarrying and processing operations. It pioneered the use of explosives to free large quarry blocks and diamond sawing techniques.

Other Industrial Minerals.—Several industrial mineral commodities were processed into added-value products from raw materials not mined by the processing company. Although these commodities are not included in table 1, they play a significant role in the overall mineral industry in Georgia.

Kemira Inc. used several industrial minerals at its titanium dioxide pigment plant in Savannah. The plant is one of two in the United States that uses both the chloride and the sulfate processes to produce TiO_2 . In addition to the TiO_2 pigments, gypsum was produced as a byproduct. The byproduct gypsum, along with imported crude gypsum, was used

by Domtar Inc. to manufacture wallboard at its plant in Savannah. Wallboard was also manufactured by the Gypsum Div. of Georgia-Pacific Corp. near Brunswick in Glynn County and Gold Bond Building Products Div. of National Gypsum Corp. in Garden City, Chatham County. Georgia-Pacific also operated a gypsum-plaster plant in Marietta, Cobb County. All four plants calcined crude gypsum imported principally from Nova Scotia. Georgia led the Nation in the quantity of byproduct gypsum produced and ranked second in its attendant value, after ranking first in both categories in 1991. The State also ranked 10th in quantity and 12th in the value of calcined gypsum produced in 1992.

The Specialty Products Div. of Franklin Industrial Minerals Co. ground calcined gypsum for use in flame and smoke suppressants at its Dalton plant. Alumina trihydrates, brucite, calcium carbonate, and calcium sulfate also were ground and blended at the plant for use in fire retardant materials and reinforced plastics. Other companies grinding similar materials and producing comparable products were Custom Grinders Sales Inc. and Filler Products Co., Chatsworth, Murray County; Dalton Alumina Chemical Co., Dalton; and Solem Div., J. M. Huber Corp., Fairmount, Gordon County.

Arsenic trioxide was converted to arsenic acid for use in the production of arsenical wood preservatives by Hickson Corp., a subsidiary of Hickson International PLC, Castleford, England, in Conley, De Kalb County.

Bentonite from Wyoming was used by Clem Environmental Corp. to manufacture geocomposite clay liners for the water, waste, mining, and petrochemical industries.

Celestite was imported from Mexico by Chemical Products Co. of Cartersville to be manufactured into strontium chemicals. The major product was strontium carbonate used in the manufacture of color television and video screens.

Various iodine chemicals were produced by Ajay Chemicals Inc. at Powder Springs, Cobb County; Diversey

Wyandotte Corp. at Tucker, De Kalb County; and Natrochem Inc. at Savannah, Chatham County.

A significant increase in both the quantity of expanded perlite produced and its associated value improved Georgia's national ranking to third and fifth, respectively. In 1991, Georgia ranked fifth in quantity and sixth in value. Perlite was expanded in 34 States in 1992. Armstrong World Industries Inc., which imported perlite from Greece for use in the manufacture of acoustic tile at its plant in Macon, Bibb County, was one of two producers in Georgia. Perlite also was expanded by Calcilite Insulation Products, Brunswick, Glynn County, for the manufacture of insulated block.

Florida Favorite Fertilizer Inc., Quitman, Brooks County, a manufacturer, processor, and distributor of fertilizer and other agricultural products, formed a partnership with its potash supplier, Potash Corp. of Saskatchewan Inc.

Salt was used to produce chlorine by Brunswick Pulp and Paper Co., Brunswick, Glynn County, and Olin Corp., Augusta, Richmond County. Brunswick was one of several companies that used a variety of industrial minerals to manufacture paper products. The others included Augusta Newsprint Co., Augusta; Federal Paper and Board Co., Augusta; Fort Howard Corp., Rincon, Effingham County; Gilman Paper Co., St. Marys, Camden County; and Southeast Paper Manufacturing Co., Dublin, Laurens County.

Georgia ranked 16th in value and 17th in the amount of iron and steel slag produced in 1992. Slag from Atlantic Steel Co. plants in Atlanta and Cartersville was sold as construction aggregate by International Mill Service Corp.

Production of exfoliated vermiculite was not reported to the USBM in 1992. Exfoliated vermiculite was used by Anitox Corp. at Buford, Gwinnett County. It was sold primarily to the agriculture market as a horticultural medium and fertilizer carrier. A minor amount was sold for fireproofing purposes.

Metals

There has been no metal production reported from Georgia since the last brown iron ore mine closed in early 1977. Numerous mines producing metals such as copper, gold, iron ore (goethite, limonite, and hematite), lead, manganese, pyrite, and silver had been mined, but closed because reserves were depleted or mining the low-grade ore was not economically feasible. However, metal products are commonly manufactured in the State from metallic ore or concentrates shipped into the State or from recycled metals.

Southwire Co., Carrollton, Carroll County, is one of the Nation's leading producers of aluminum and copper cable, rods, and castings. Southwire and Kaiser Chemical and Aluminum Corp. signed a letter of intent for Southwire to purchase the Kaiser's Georgia Wire Products Div. located in Macon. Georgia Wire is a manufacturer of aluminum alloy wire and screw machine stock for the transportation, construction, and consumer markets. Prior to the acquisition announcement, a U.S. Court of Appeals ruled in favor of Southwire in a dumping and countervailing duty suit filed against imports of electrically conductive aluminum redraw rod from Venezuela.

Aluminum ingots were produced by Alcan Recycling from aluminum scrap at Greensboro, Greene County. A variety of extruded aluminum products were produced by Alcan Extrusions USA, Rome, Floyd County; William L. Bonnell Co. Inc., Newnan, Coweta County; General Extrusions, Union City, Fulton County; Hoover Group Inc., Franklin, Heard County; Indal Extrusion and Macklanburg-Duncan Co., Gainesville, Hall County; and Tifton Aluminum Co. Inc., Tift County.

Atlantic Steel Co. produced hot-rolled steel bars, rods, shapes, and wire from electric arc minimills in Atlanta and Cartersville. The Atlanta plant continued to operate pending completion of work to consolidate operations in Cartersville. Bliss and Laughlin (B&L), owner of a cold-finished steel bar plant in

Cartersville, Bartow County, announced earnings of almost \$300,000 in 1992 following a loss of \$2.4 million loss in 1991. B&L instituted layoffs, froze wages, and applied other operating cost cuts that, combined with an 8% increase in sales, resulted in the reversal in earnings. B&L's Cartersville operation, which opened in 1990, is expected to grow as both foreign and domestic firms continue to build manufacturing facilities in the south.

Southern Zinc Co., Atlanta, produced zinc dust, zinc oxide, and zinc slabs from its smelter and refining operation at East Point, Fulton County.

¹State Mineral Officer, U.S. Bureau of Mines, Tuscaloosa, AL. He has 34 years of mineral-related industry and government experience and has covered the mineral activities in Georgia since 1989. Assistance in the preparation of the chapter was given by Maylene E. Hubbard, editorial assistant.

²Supervisory geologist, Georgia Geologic Survey, Environmental Protection Div., Georgia Department of Natural Resources.

³Total 1991 mineral value revised from \$1,298,621,000 to \$1,305,736,000.

⁴Total mineral value for 1990 was revised from \$1,495,124,000 to \$1,505,051,000.

⁵U.S. Department of Labor. Employment and Earnings. V. 40, No. 5, May 1993, p. 159.

⁶———. Mine Injuries and Worktime, Quarterly. Jan.-Dec. 1992, preliminary, p. 9.

⁷Industrial Minerals (London, United Kingdom). Kemira Buys Into Nord Kaolin. No. 298, July 1992, p. 18.

GEORGIA



Principal Mineral-Producing Localities

LEGEND		MINERAL SYMBOLS					
	State boundary	Au	Gold	D-M	Dimension Marble	Mica	Mica
	County boundary	Ba	Barite	D-Q	Dimension Quartzite	Per	Perlite plant
	Capital	Cem	Cement plant	Fel	Feldspar	SG	Sand and Gravel
	City	Clay	Clay	FePg	Iron Oxide pigments	Steel	Iron and Steel plant
	Crushed stone/sand & gravel districts	CS	Crushed Stone	Ful	Fuller's earth	Ti	Titanium plant
		Cu	Copper smelter	Gyp	Gypsum plant		Concentration of mineral operations
		D-G	Dimension Granite	Kao	Kaolin		

TABLE 7
PRINCIPAL PRODUCERS

Commodity and company	Address	Type of activity	County
Barite:			
Cyprus Industrial Minerals Co.	Box 130 Cartersville, GA 30120	Open pit mine and mill	Bartow.
New Riverside Ochre Co. ¹	Box 387 Cartersville, GA 30120	do.	Do.
Bauxite:			
Mullite Co. of America	Box 37 Andersonville, GA 31711	Open pit mines and mill	Macon and Sumter.
Cement:			
Blue Circle Inc. ²	2520 Paul Ave., NW Atlanta, GA 30318	Plant	Fulton.
Medusa Cement Co. ²	Box 120 Clinchfield, OH 31013	do.	Houston.
Clays:			
Common:			
Bickerstaff Clay Products Co.	Box 1178 Columbus, GA 31993	Open pit mines	Columbus and Floyd.
Boral Bricks Inc.	Box 1957 Augusta, GA 30903	Open pit mines and plants	Bibb and Richmond.
Chattahoochee Brick Co., a subsidiary of General Shale Products Corp.	Box 813250 Smyrna, GA 30081	do.	Floyd and Fulton.
Fuller's earth:			
Englehard Corp.	Box 222 Attapulgus, GA 31715	do.	Decatur.
Oil Dri Corp. of America	Box 200A Ochlocknee, GA 31773	do.	Thomas.
Waverly Mineral Products Co.	Box 106 Meigs, GA 31765	do.	Do.
Kaolin:			
ECC International Inc.	Box 471 Sandersville, GA 31082	do.	Various.
Engelhard Corp.	Box 37 Gordon, GA 31031	do.	Decatur, Washington Wilkinson.
J. M. Huber Corp.	Route 4 Huber, GA 31298	do.	Various.
Feldspar:			
The Feldspar Corp.	Mine Rd. Monticello, GA 31064	Open pit mines and plant.	Greene and Jasper.
Gypsum:			
Byproduct:			
Kemira Inc.	Box 368 Savannah, GA 31402	Plant	Chatham.
Calcined:			
Georgia-Pacific Corp., Gypsum Div.	Box 1397 Brunswick, GA 31520	do.	Glynn.
Gold Bond Building Products, a subsidiary of National Gypsum Corp.	Box 7016 Garden City, GA 31408	do.	Chatham.
Domtar Gypsum, division of Domtar Inc.	Box 1526 Savannah, GA 31498	do.	Do.
Mica:			
Franklin Mineral Products Co. Inc., division of The Mearl Corp.	Drawer 390 Hartwell, GA 30643	do.	Hart.

See footnotes at the end of table.

TABLE 7—Continued
PRINCIPAL PRODUCERS

Commodity and company	Address	Type of activity	County
Sand and gravel:			
Construction:			
Atlas Sand and Gravel Co.	Box 249 Eden, GA 31307	Open pit mines	Effingham.
Brown Brothers Sand Co.	Route 1 Roberta, GA 31087	do.	Talbot.
Southern Aggregates Co.	Box 4510 Augusta, GA 30907	do.	Richmond.
Industrial:			
Atlanta Sand & Supply Co. ³	Route 1 Roberta, GA 31078	Open pit mine and plant	Crawford.
Montgomery Sand Co., a subsidiary of Florida Crushed Stone Co. ³	Box 255 Mount Vernon, GA 39445	do.	Montgomery.
The Morie Co. Inc., Georgia Silica Div. ³	1201 North High St. Millville, NJ 08332	do.	Marion.
Stone:			
Crushed:			
Davidson Minerals Properties Inc. and The Stoneman Inc., subsidiaries of Hanson PLC	Box 486 Lithonia, GA 30058	Quarries and plants	Various
Martin Marietta Aggregates Co.	Box 4380 Augusta, GA 30917	do.	Do.
Vulcan Materials Co.	Box 80730 Atlanta, GA 30366	do.	Do.
Dimension:			
Granite:			
Keystone Granite Co.	Box 516 Elberton, GA 30635	do.	Oglethorpe.
Royalty Granite Corp.	Box 39 Carlton, GA 30627	Quarries	Madison and Oglethorpe.
T & C Quarries Inc.	Box 119 Elberton, GA 30635	do.	Elbert and Oglethorpe.
Marble:			
Georgia Marble Co.	Building 100 1201 Roberts Blvd. Kennesaw, GA 30144	do.	Pickens.

¹Also produced crude iron oxide pigments.

²Also produced common clay and limestone.

³Also construction sand and gravel.