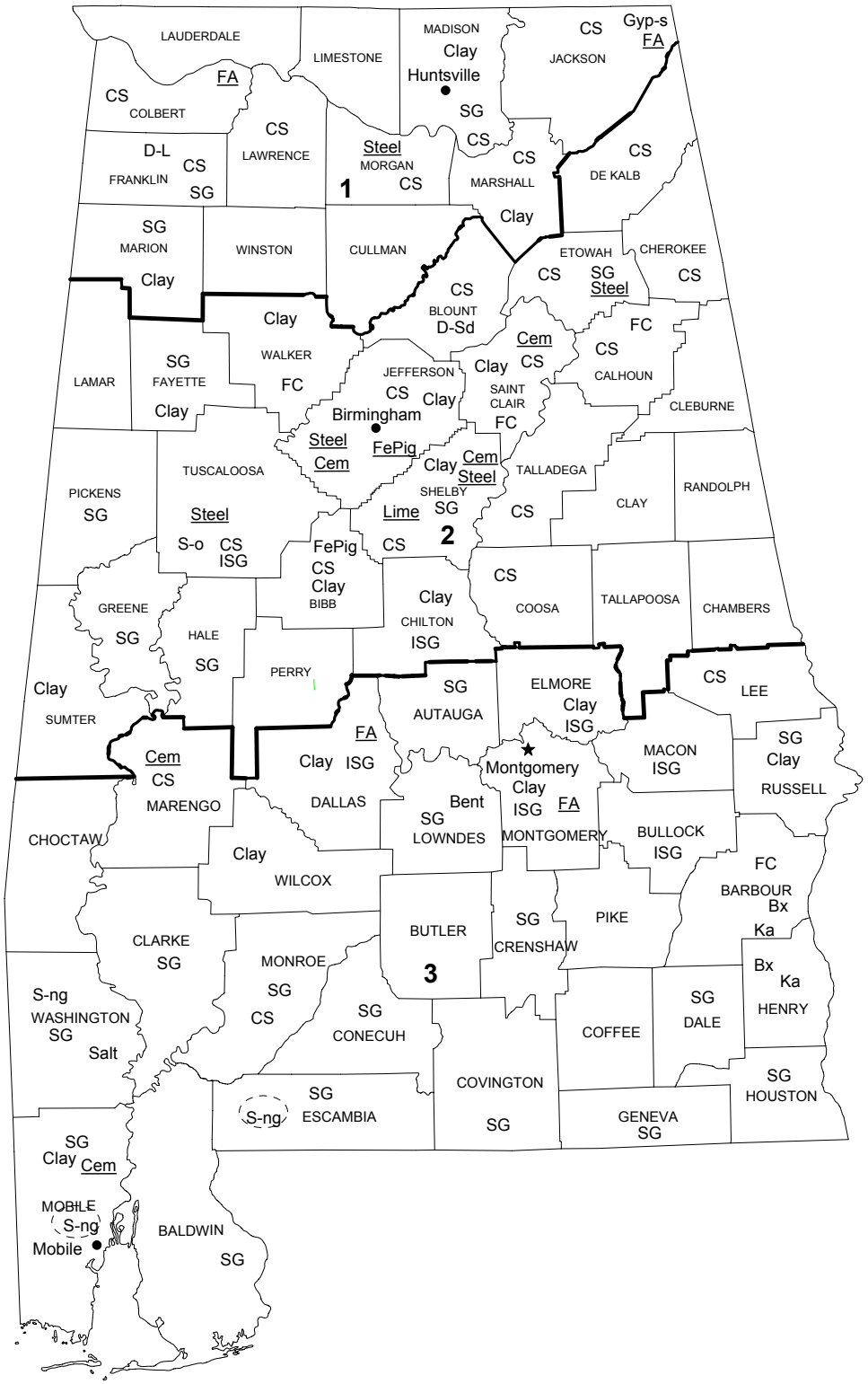
ALABAMA



LEGEND

- County boundary
- ★ Capital
- ● City
- 1 Crushed stone/sand and gravel districts

MINERAL SYMBOLS
(Major producing areas)

Bent	Bentonite
Bx	Bauxite
Clay	Common clay
Cem	Cement plant
CS	Crushed stone
D-L	Dimension limestone
D-Sd	Dimension sandstone
FA	Ferroalloys plant
FC	Fire clay
FePig	Iron oxide pigments
FePig	Iron oxide pigment plant
Gyp-s	Synthetic gypsum
ISG	Industrial sand and gravel
Ka	Kaolin
Lime	Lime plant
S-ng	Sulfur (natural gas)
S-o	Sulfur (oil)
Salt	Salt
SG	Construction sand and gravel
Steel	Steel plant
	Concentration of mineral operations

0 50 Kilometers

Source: Geological Survey of Alabama/U.S. Geological Survey (2004)

THE MINERAL INDUSTRY OF ALABAMA

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

In 2004, Alabama's nonfuel mineral production was valued[1] at $972 million, based upon annual U.S. Geological Survey (USGS) data. This was an 8% increase compared with that of 2003[2] following a 6.8% increase from 2002 to 2003. The State ranked 18th (17th in 2003) among the 50 States in total nonfuel mineral production value; Alabama accounted for more than 2% of the U.S. total.

The top four nonfuel mineral commodities produced in Alabama in 2004 continued to be, descending order of value, cement (portland and masonry), crushed stone, lime, and construction sand and gravel. These four commodities accounted for nearly 93% of the State's total nonfuel mineral production value; the combined value of cement and crushed stone represented about 69% of the total.

In 2004, the increased values of cement overall (portland and masonry), crushed stone, lime, and common clays led Alabama's rise in value with increases in value of nearly $41 million, $17 million, $13 million, and $5.6 million, respectively, despite small decreases in crushed stone and lime production. The largest decreases in value were for construction sand and gravel and dimension stone, which were down about $2 million each, and kaolin, which was down about $1 million (table 1).

In 2003, the State's rise in nonfuel mineral value resulted mostly from increases in crushed stone, $29 million; lime, $24 million; construction sand and gravel, nearly $11 million; and salt, about $7 million. The largest decrease in value was in cement (portland and masonry) overall about $11 million (table 1).

Nonfuel mineral production in Alabama consisted entirely of industrial minerals. Alabama continued to be the second ranked kaolin-producing State in 2004 and remained third in common clays and iron oxide pigments and eighth in salt. The State decreased to third from second in lime, to fourth from third in bentonite, to fifth from third in masonry cement, to seventh from sixth in portland cement, and to a virtual tie for ninth from eighth in gemstones (gemstones ranking based upon value). Additionally, Alabama was a producer of substantial quantities of, in descending order of value, crushed stone, construction sand and gravel, and industrial sand and gravel. All metal production in the State, especially that of raw steel, was the result of processing materials acquired from other domestic and foreign sources. Production of a natural mixture of bauxite (no longer used to produce primary aluminum) and bauxitic clay with very low iron oxide content has been reported to the USGS since 1995 as kaolin; it is primarily used to make refractory products.

The narrative information that follows was provided by the Geological Survey of Alabama[3] (GSA).

Exploration and Development

Mineral exploration in Alabama continued to focus on industrial mineral resources, resulting in increases of identified resources for several industrial minerals. The Alabama Development Office reported that recent capital investment in expanding industrial mineral operations from 2003 to 2004 was more than $63 million. This included brick/tile operations, calcium carbonate, cement, crushed stone, lime, and refractory clay. A new mica recovery operation began operations at Micaville, Randolph County. Muscovite flake mica occurs as finely disseminated flakes in the mica schist of the northern Alabama Piedmont. Scrap or flake mica is used by industry in dry-, wet-, or micronized-ground form.

Commodity Review

Industrial Minerals

In 2004, 166 companies or operations were involved in the mining and production of industrial nonfuel mineral resources in Alabama; the majority was for the mining of aggregates. This included 50 active limestone-dolomite operations for crushed stone. In addition, granite, quartzite and sandstone operations for crushed stone also were active. New granite operations were started in Lee and Randolph Counties.

According to 2004 reports, crushed stone production exceeded 49 million metric tons (Mt); this was another year of record-level production. Birmingham-based Vulcan Materials Co. remained the leading construction aggregate producer in the country. Marble operations were active for the production of micronized calcium carbonate and building stone. Alabama had 20 active clay (bentonite, common clay, fire clay, fuller's earth, kaolin, and shale) operations. Clay production was led by common clay followed by shale, fuller's earth, bentonite, fireclay, and kaolin.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the 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 2004 USGS mineral production data published in this chapter are those available as of December 2005. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—also can be retrieved over the Internet at URL http://minerals.usgs.gov/minerals.

[2]Values, percentage calculations, and rankings for 2003 may differ from the Minerals Yearbook, Area Reports: Domestic 2003, Volume II, owing to the revision of preliminary 2003 to final 2003 data. Data and rankings for 2004 are considered to be final and are not likely to change significantly.

[3]Lewis S. Dean, a Geologist at the Geological Survey of Alabama, authored the text of the State mineral industry information provided by that agency.

Alabama had 81 active sand and gravel operations. Sand and gravel production came primarily from Quaternary alluvium and terrace deposits in Elmore, Macon, Montgomery, Russell, and Tuscaloosa Counties and from the Citronelle Formation in Mobile County.

Other industrial mineral operations included chalk, building stone (limestone and sandstone), salt (solution recovery), bauxitic clays, silicon, and recovered sulfur.

Government Activities and Programs

The largest beach renourishment project along coastal Alabama was continued in 2004 by the City of Gulf Shores, which had initiated a project in 2003 to pump nearly 500,000 cubic meters of sand from the bottom of Little Lagoon to the Gulf of Mexico shoreline along West Beach.

In 2004, the GSA continued to publish 1:24,000-scale geologic maps in Alabama in conjunction with the STATEMAP program. STATEMAP is a component of the Congressionally mandated USGS National Cooperative Geological Mapping Program (NCGMP), which distributes Federal funds to support geologic mapping efforts through a competitive funding process. The NCGMP has three primary components: (1) FEDMAP, which funds Federal geologic mapping projects, (2) STATEMAP, which is a matching-funds grant program with State geological surveys, and (3) EDMAP, a matching-funds grant program with universities that has a goal to train the next generation of geologic mappers. This new geologic map information is being used in a variety of ways in these rapidly urbanizing parts of the State. For example, geologic mapping aided in the identification of supplies of industrial mineral resources (sand, gravel, and crushed stone) that support construction and infrastructure development. Published geologic 7.5-minute quadrangles during 2004 included the Trinity, Decatur, Jones Crossroads, and Tanner quads in the Limestone and the Morgan County areas of the Tennessee Valley and the Cooks Spring, Laniers, Springville, and Ragland quads in the Shelby and the St. Clair County areas of the Valley and Ridge geologic province.

More information on geology, hydrology, occurrence, mining history, and general economics of specific mineral resources in Alabama is available from the Geological Survey of Alabama. Much of this information, as well as contact information, is available over the Internet at URL http://www.gsa.state.al.us.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN ALABAMA[1, 2]

(Thousand metric tons and thousand dollars)

Mineral	2002		2003		2004	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	380	42,000 [e]	565	55,700 [e]	430	49,400 [e]
Portland	4,540	298,000 [e]	4,330	273,000 [e]	4,800	320,000 [e]
Clays:						
Bentonite	125	3,810	125	3,810	100	3,050
Common	2,020	24,600	1,920	24,000	2,120	29,600
Kaolin	531	14,600	W	W	W	W
Gemstones	NA	356	NA	356	NA	356
Lime	2,040	127,000	2,290	151,000	2,280	164,000
Sand and gravel:						
Construction	12,500	56,700	14,500	67,600	14,700	65,300
Industrial	722	8,990	723	9,180	643	9,800
Stone, crushed	43,400	257,000 [r]	49,300	286,000	49,100	303,000
Combined values of iron oxide pigments (crude), salt, stone (dimension marble and sandstone), and values indicated by symbol W	XX	8,850	XX	30,000	XX	27,000
Total	XX	843,000 [r]	XX	900,000	XX	972,000

[e]Estimated. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined values" data.
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.

TABLE 2
ALABAMA: CRUSHED STONE SOLD OR USED, BY KIND[1]

	2002				2003				2004			
Kind	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	49	35,000	$205,000 [r]	$5.85 [r]	49	41,300	$239,000	$5.78	52	41,300	$244,000	$5.91
Dolomite	3	W	W	6.57	3	W	W	6.57	3	W	W	6.33
Marble	2	W	W	6.38	2	W	W	5.82	2	W	W	10.33
Sandstone	8	2,150	13,200	6.15	8	1,820	10,000	5.49	9	1,530	8,250	5.41
Granite	1	W	W	5.45	2	W	W	6.43	2	W	W	6.57
Slate	2	W	W	7.16	2	W	W	5.81	2	W	W	5.82
Miscellaneous stone	3	71	230	3.22	1	W	W	2.11	1	W	W	8.85
Total or average	XX	43,400	257,000 [r]	5.93 [r]	XX	49,300	286,000	5.80	XX	49,100	303,000	6.17

[r]Revised. W Withheld to avoid disclosing company proprietary data; included in "Total or average." XX Not applicable.
[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

TABLE 3a
ALABAMA: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 2003, BY USE[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregates (+1½ inch):			
Riprap and jetty stone	290	$1,310	$4.51
Other coarse aggregates	778	5,980	7.69
Total or average	1,070	7,290	6.82
Coarse aggregates, graded:			
Concrete aggregate, coarse	815	5,100	6.26
Bituminous aggregate, coarse	1,270	8,170	6.43
Bituminous surface-treatment aggregate	193	1,140	5.90
Other graded coarse aggregates	7,950	52,100	6.56
Total or average	10,200	66,500	6.51
Fine aggregate (-⅜ inch):			
Stone sand, concrete	W	W	5.84
Stone sand, bituminous mix or seal	W	W	4.79
Screening, undesignated	138	590	4.28
Other fine aggregates	2,510	13,900	5.52
Total or average	2,650	14,400	5.46
Coarse and fine aggregates:			
Graded road base or subbase	1,460	8,830	6.05
Crusher run or fill or waste	W	W	5.76
Roofing granules	W	W	3.94
Other coarse and fine aggregates	6,080	38,700	6.36
Total or average	7,540	47,500	6.30
Agricultural limestone	(2)	(2)	6.81
Chemical and metallurgical:			
Cement manufacture	4,150	12,700	3.05
Lime manufacture	(2)	(2)	6.92
Total or average	4,150	12,700	3.05
Other miscellaneous uses	231	444	1.92
Unspecified:[3]			
Reported	16,300	96,900	5.95
Estimated	7,200	40,000	5.61
Total or average	23,500	137,000	5.85
Grand total or average	49,300	286,000	5.80

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

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

[2]Withheld to avoid disclosing company proprietary data, included in "Unspecified: Reported."

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

TABLE 3b
ALABAMA: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 2004, BY USE[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregates (+1½ inch):			
Riprap and jetty stone	152	$1,040	$6.85
Other coarse aggregates	785	6,270	7.98
Total or average	937	7,310	7.80
Coarse aggregates, graded:			
Concrete aggregate, coarse	1,530	9,080	5.93
Bituminous aggregate, coarse	1,880	11,900	6.32
Bituminous surface-treatment aggregate	133	1,360	10.22
Other graded coarse aggregates	8,170	52,900	6.47
Total or average	11,700	75,200	6.42
Fine aggregate (-⅜ inch):			
Stone sand, concrete	134	840	6.27
Stone sand, bituminous mix or seal	187	1,130	6.02
Screening, undesignated	303	1,550	5.12
Other fine aggregates	2,460	13,300	5.40
Total or average	3,080	16,800	5.45
Coarse and fine aggregates:			
Graded road base or subbase	2,410	13,100	5.43
Terrazzo and exposed aggregate	W	W	6.39
Crusher run or fill or waste	436	2,580	5.91
Other coarse and fine aggregates	7,260	59,000	8.13
Total or average	10,100	74,700	7.39
Other construction materials	413	2,600	6.30
Agricultural:			
Agricultural limestone	323	2,180	6.75
Other agricultural uses	160	528	3.31
Total or average	483	2,710	5.60
Chemical and metallurgical:			
Cement manufacture	2,550	6,180	2.43
Lime manufacture	(2)	(2)	7.61
Flux stone	(2)	(2)	6.50
Total or average	3,380	12,200	3.62
Special, other fillers or extenders	(3)	(3)	16.53
Unspecified:[4]			
Reported	12,600	75,400	5.98
Estimated	6,400	36,000	5.68
Total or average	19,000	112,000	5.88
Grand total or average	49,100	303,000	6.17

W Withheld to avoid disclosing company proprietary data; included with "Other coarse and fine aggregates."

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

[2]Withheld to avoid disclosing company proprietary data, included in "Total or average."

[3]Withheld to avoid disclosing company proprietary data, included in "Unspecified: Reported."

[4]Reported and estimated production without a breakdown by end use.

TABLE 4a

ALABAMA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2003, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch)[2]	W	W	W	W	W	W
Coarse aggregate, graded[3]	W	W	W	W	W	W
Fine aggregate (-⅜ inch)[4]	W	W	W	W	W	W
Coarse and fine aggregate[5]	W	W	W	W	W	W
Agricultural[6]	(7)	(7)	(7)	(7)	(7)	(7)
Chemical and metallurgical[8]	--	--	(7)	(7)	(7)	(7)
Other miscellaneous uses	--	--	231	444	--	--
Unspecified:[9]						
Reported	2,780	15,700	11,700	69,500	1,840	11,700
Estimated	1,200	5,600	5,700	33,000	330	1,900
Total	12,400	71,000	32,900	191,000	3,990	23,900

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

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

[2]Includes riprap and jetty stone and other coarse aggregates.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, and other graded aggregates.

[4]Includes screening (undesignated) and other fine aggregates.

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

[6]Includes agricultural limestone.

[7]Withheld to avoid disclosing company proprietary data; included in "Unspecified: Reported."

[8]Includes cement and lime manufacture.

[9]Reported and estimated production without a breakdown by end use.

TABLE 4b

ALABAMA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2004, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch)[2]	W	W	W	W	W	W
Coarse aggregate, graded[3]	4,480	28,000	6,810	44,300	418	2,880
Fine aggregate (-⅜ inch)[4]	1,030	6,110	2,000	10,400	56	259
Coarse and fine aggregate[5]	4,050	22,200	5,340	45,300	719	7,200
Other construction materials	413	2,600	--	--	--	--
Agricultural[6]	W	W	W	W	W	W
Chemical and metallurgical[7]	--	--	W	W	W	W
Special[8]	--	--	(9)	(9)	--	--
Unspecified:[10]						
Reported	1,670	10,400	9,290	54,200	1,660	10,800
Estimated	1,300	6,900	5,100	29,000	--	--
Total	13,600	80,900	31,300	197,000	4,260	25,600

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

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

[2]Includes riprap and jetty stone and other coarse aggregates.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, and other graded aggregates.

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

[5]Includes crusher run or fill or waste, graded road base or subbase, terrazzo and exposed aggregate, and other coarse and fine aggregates.

[6]Includes agricultural limestone and other agricultural uses.

[7]Includes cement and lime manufacture and flux stone.

[8]Includes other fillers or extenders.

[9]Withheld to avoid disclosing company proprietary data; included in "Unspecified: Reported."

[10]Reported and estimated production without a breakdown by end use.

TABLE 5a

ALABAMA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2003, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)[2]	5,960	$27,100	$4.54
Concrete products (blocks, bricks, pipe, decorative, etc.)	188	1,270	6.78
Asphaltic concrete aggregates and other bituminous mixtures	1,990	10,400	5.23
Road base and coverings	243	1,050	4.31
Fill	230	591	2.57
Snow and ice control	5	26	5.33
Other miscellaneous uses[3]	148	1,220	8.23
Unspecified:[4]			
Reported	1,820	8,700	4.78
Estimated	3,900	17,000	4.42
Total or average	14,500	67,600	4.67

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

[2]Includes plaster and gunite sands.

[3]Includes roofing granules.

[4]Reported and estimated production without a breakdown by end use.

TABLE 5b

ALABAMA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	6,150	$24,100	$3.91
Plaster and gunite sands	426	2,920	6.84
Concrete products (blocks, bricks, pipe, decorative, etc.)	55	377	6.79
Asphaltic concrete aggregates and other bituminous mixtures	1,180	8,630	7.29
Road base and coverings[2]	443	1,290	2.91
Fill	948	2,160	2.28
Snow and ice control	50	138	2.74
Other miscellaneous uses[3]	108	476	4.43
Unspecified:[4]			
Reported	2,320	11,400	4.90
Estimated	3,000	14,000	4.65
Total or average	14,700	65,300	4.45

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

[2]Includes road and other stabilization (cement and lime).

[3]Includes filtration.

[4]Reported and estimated production without a breakdown by end use.

TABLE 6a

ALABAMA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2003, 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 (including concrete sand)[2]	946	5,670	809	4,260	4,210	17,200
Concrete products (blocks, bricks, pipe, decorative, etc.)	W	W	153	1,040	W	W
Asphaltic concrete aggregates and road base materials	331	2,180	W	W	W	W
Fill	30	87	11	124	189	380
Other miscellaneous uses[3]	40	404	338	2,480	1,710	7,870
Unspecified:[4]						
Reported	--	--	--	--	1,820	8,700
Estimated	35	160	220	1,000	3,600	16,000
Total	1,380	8,500	1,530	8,920	11,600	50,100

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

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

[2]Includes plaster and gunite sands.

[3]Includes roofing granules, and snow and ice control.

[4]Reported and estimated production without a breakdown by end use.

TABLE 6b

ALABAMA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004, BY USE AND DISTRICT[1, 2]

(Thousand metric tons and thousand dollars)

Use	Districts 1 and 2		District 3	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[3]	1,870	10,600	4,760	16,700
Asphaltic concrete aggregates and road base materials[4]	W	W	W	W
Fill	11	79	936	2,090
Other miscellaneous uses[5]	356	2,280	1,430	8,250
Unspecified:[6]				
Reported	472	2,420	1,850	8,950
Estimated	330	1,500	2,700	12,000
Total	3,040	16,900	11,600	48,400

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

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

[2]Districts 1 and 2 are combined to avoid disclosing company proprietary data.

[3]Includes plaster and gunite sands.

[4]Includes road and other stabilization (cement and lime).

[5]Includes filtration and snow and ice control.

[6]Reported and estimated production without a breakdown by end use.