



# THE MINERAL INDUSTRY OF ARKANSAS

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

In 2004, Arkansas' nonfuel raw mineral production was valued<sup>1</sup> at \$518 million based upon annual U.S. Geological Survey (USGS) data. This was a 13.8% increase compared with that of 2003<sup>2</sup> and followed a marginal decrease from 2002 to 2003. The State increased in rank to 29th from 30th among the 50 States in total nonfuel mineral production value in 2004 and accounted for more than 1% of the U.S. total.

In 2004, bromine, followed by crushed stone, cement (portland and masonry), and construction sand and gravel, were Arkansas' leading nonfuel minerals by value; altogether these commodities accounted for about 92% of the State's total nonfuel mineral value. Since 1969, bromine has been the State's leading nonfuel mineral except during the years 1996-98 and 2001-03 when it ranked second to crushed stone. For longer than a decade, cement has ranked third and construction sand and gravel has ranked fourth. Actual production data for bromine and cement have been withheld to avoid disclosing company proprietary data.

Most of Arkansas' nonfuel minerals increased in production value in 2004. Bromine production, which increased slightly, led the way with a nearly \$35 million increase in value. It was followed by crushed stone and lime, which were up by \$15 and nearly \$9 million, respectively. Lime production increased significantly. Smaller yet significant increases took place in the values of industrial sand and gravel, construction sand and gravel, and common clays (descending order of change). The value of gemstones was up by about 24%. Only portland cement and tripoli values were down, slightly (table 1).

During 2003, the production values of portland cement, construction sand and gravel, and gypsum increased by about \$10 million, \$6.6 million, and nearly \$5 million, respectively. Also, tripoli showed a small increase in value. Decreases in the values of crushed stone, bromine, and common clays, which were down by a combined \$24 million, outweighed the gains however, and resulted in the State's small net decrease for the year. The value of gemstones was down by about 25% (table 1).

Arkansas continued to be the leading bromine-producing State in 2004 and accounted for most U.S. production. Michigan was the only other State that produced bromine. Mining operations in both States extracted subsurface, bromine-rich natural brines by submersible pump for subsequent processing. Arkansas continued to be the only State that produced silica stone; it ranked third of four tripoli-producing States and fifth in gemstones. Even though gypsum production was up by about 13%, the State decreased in rank to ninth from eighth. Additionally, significant quantities of crushed stone, industrial sand and gravel, and common clays (11th in rank) were produced in the State. The State's metal (mostly raw steel) production resulted from used materials received from other domestic and foreign sources.

Strategic Minerals Corp. continued operation of the mill facility at Potash Sulphur Springs in Garland County; the mill extracts vanadium pentoxide from recycled out-of-State vanadium-bearing feed.

The Arkansas Geological Commission<sup>3</sup> (AGC) provided the following narrative information.

## Commodity Review

### *Industrial Minerals*

**Crushed Stone.**—Arkholo Sand and Gravel Co. continued to explore for additional quarry sites in the western portion of the Arkansas River Valley. Arkholo produced road aggregates and asphalt mix at the Preston Quarry near Van Buren in Crawford County. Arkholo continued to work a Hartshorne Sandstone quarry near the Jenny Lind Mine in Sebastian County. Bobby Plant Asphalt Co., which was based in Murfreesboro, Pike County, produced crushed stone from its quarry in the Jackfork Sandstone (Lower Pennsylvanian) south of Kirby in central Pike County.

Duffield Stone and Gravel Co. operated two sandstone aggregate quarries (Pennsylvanian) in Pope County; one in the Hartshorne Sandstone at Russellville, and the other, the Gumlog Quarry, in the upper Atoka Formation. The company continued exploration in the Arkansas River Valley. Pyramid Co. produced aggregate from the middle Atoka Formation (Pennsylvanian) north of Greenbrier in Faulkner County. McClinton-Anchor, Inc. continued to explore for new aggregate quarry sites in the limestone-bearing region of northwest Arkansas.

Granite Mountain Quarries, Inc. (GMQ) produced aggregate from nepheline syenite at two quarries in Pulaski County and from the Granite Mountain No. 3 quarry near Bryant in Saline County. GMQ continued evaluating two other sites—one in the lower Atoka Formation west of Boles in southern Scott County and another in the Hartshorne Sandstone west of Greenwood in Sebastian County.

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<sup>1</sup>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>.

<sup>2</sup>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.

<sup>3</sup>J. Michael Howard, Geology Supervisor/Mineralogist, authored the text of the State mineral industry information provided by the Arkansas Geological Commission.

Martin Marietta Co. actively quarried the Hatton Tuff lentil of the Stanley Group (Mississippian) at the Hatton Quarry in southern Polk County. The company acquired new leases east of the quarry site to near the Cossatot River and was to install a third crusher and processing unit at this site. Martin Marietta continued operations at the 270 Quarry near Magnet Cove in Hot Spring County and produced from the hornfels and quartzite alteration zone in the Stanley Group adjacent to the Cretaceous igneous intrusion. The company operated an asphalt plant at this site; the plant was built in 2000.

Rogers Group, Inc. continued sandstone aggregate operations at its Greenbriar Quarry in the middle Atoka Formation in Faulkner County, at its Conway County Quarry in upper Atoka Formation south of Solgohacia, and at its Lowell Quarry in the limestone of the Boone Formation (Mississippian) in southern Benton County. Schwartz Stone Co. quarried sandstone from the Hartshorne Sandstone quarry for aggregate and dimension stone north of Midway in Logan County. Texas Industries Group continued to evaluate tuff deposits on leases in southern Polk County. McGeorge Sand and Gravel Co. continued riprap barge operations along the Arkansas River from its River Mountain Quarry in the Hartshorne Sandstone area north of New Blaine in eastern Logan County. Chrisman Co. mined sandstone aggregate in the Hartshorne Sandstone area near Hunt in Johnson County and from the Savanna Formation near Ratcliffe in Franklin County.

Vulcan Materials Co., which was based in Birmingham, AL, produced aggregate from its upper Morrowan age sandstone operations at Judsonia and middle Atokan age sandstones at Floyd; both sites are in White County. Vulcan also produced dolomitic limestone from lower Ordovician units near Black Rock in Lawrence County. Vulcan continued aggregate exploration, with the focus on Morrowan and Atokan age sandstones in White and Cleburne Counties. Webco Mining produced crushed stone from its quarry in the middle Atoka Formation near El Paso in White County.

**Gypsum.**—In 2004, BPB Gypsum, which is near Nashville in Howard County, continued to be the world's largest wallboard manufacturing plant, with a capacity of 130 million square meters per year. The plant and mines employed about 200 people in 2004. The principal markets for the wallboard were in the eastern United States. The wallboard was shipped by rail and truck.

**Nepheline Syenite.**—Minnesota Mining and Manufacturing Co. mined nepheline syenite from its Big Rock Arch Street Quarry to supply its roofing granule plant in Sweet Home, Pulaski County. Martin Marietta continued concurrent mining of syenite dike rock for aggregate in this quarry.

**Sand and Gravel.**—One hundred sand and gravel operations were active in Arkansas in 2003 and 110 were active in 2004; the greatest number of these operations were in the southeastern part of the State (the Gulf Coastal Plain). Eighteen new sand and gravel operations were permitted by the Surface Mining and Reclamation Division of the Arkansas Department of Environmental Quality (ADEQ) in 2004. By the end of 2004, 30 Quarry Notifications of Intent were on file. During 2004, ADEQ issued three Authorizations to Quarry pursuant to the Arkansas Quarry Operation, Reclamation and Safe Closure Act. These Authorizations to Quarry were issued to Arkhola Sand and Gravel in Sebastian County, to Chrisman Ready Mix in Johnson County, and to Quality Rock, Inc. in Cleburne County.

**Other Industrial Minerals.**—Albermarle and Great Lakes Chemical Co. continued operations at their bromine extraction and production plants, which were in Columbia and Union Counties, respectively. Prices for bromine-based products steadily increased worldwide during the year. In 2004, Great Lakes Chemical Corporation announced that it will add a new bromine supply well for the extraction of elemental bromine at the company's South Arkansas facility and double its capacity to produce the polybrominated styrene (PBS) series of performance brominated flame retardants to meet strong industry demand. Expansion of the elemental bromine and PBS flame retardant facilities will be completed by the end of the first quarter 2005.

Mark Wallis Whetstones continued sporadic operation of a whetstone-grade mine south of Lonsdale near the Saline-Hot Spring County line. Martin Marietta obtained control of the Butterfield Quarry in Hot Spring County in 2004, but the quarry was inactive during the year. Martin Marietta also produced aggregate and high-silica novaculite from a quarry near Glen Rose in Hot Spring County. Smith Whetstone, Inc. of Hot Springs in Garland County manufactured a variety of grades of oilstones (whetstones) from its Arkansas Novaculite (Mississippian-Devonian) quarry operations. Malvern Minerals Co. of Hot Springs, Garland County, produced tripoli from its mine in the Bigfork Chert (Middle and Late Ordovician).

Oran McBride Stone Co. of Batesville in Independence County continued production of interior and exterior structural and architectural stone at its plant in Bethesda. Polished, cut, and rough surface marble, limestone, and sandstone were quarried from Ordovician-age formations and processed. Bennett Brothers Stone Co., Inc. obtained building stone materials from deposits in Franklin, Logan, Garland, and other counties.

Ash Grove Cement Co., which was the sole producer of cement in the State, operated the Foreman plant in Little River County using chalk from the Annona Formation and silica from the Marlbrook Formation (both Cretaceous). Arkansas Lime Co. of Batesville, Independence County, produced quick lime, hydrated lime, and pulverized limestone for glass manufacturing and agriculture lime. Their quarry is in a section of the Boone Formation (Mississippian) that is high purity and low in silica (chert). Acme Brick Co., which was owned by Berkshire-Hathaway, is near Malvern in Hot Spring County. Acme continued operation of its Wilcox Group (Eocene) clay mines for brick production at Perla.

## **Environmental Issues and Mine Reclamation**

Alcoa Inc. is approximately two-thirds finished with a 20-year land reclamation project of former bauxite properties adjacent to the community of Bauxite in Saline County. Alcoa's reclamation project includes a large acreage of pre-land-reclamation-law land. Umetco, Inc. continued the reclamation of the Wilson Springs vanadium mines area in Garland County that began in 1997. The Black Lick diamond property, which was reclaimed by Star Resources Corp. of Houston, TX, is northeast of the Crater of Diamonds State Park in Pike County; Star is awaiting release of its bond money.

## Government Programs

During 2004, 187 noncoal mine sites were active, permitted, or authorized in Arkansas. The total noncoal area under permit was nearly 12,060 hectares (ha), and there was about 250 ha of reclaimed land released from eight permitted sites during 2004. No amendments or changes to State laws and/or regulations concerning mining and/or mine reclamation were made in Arkansas during 2004.

Operators of 27 quartz contracts with the U.S. Department of Agriculture's Forest Service on the Ouachita National Forest in Arkansas generated about \$13,500 in revenue and approximately \$5,000 more on three producing leases. In 2004, 383 diamonds were recovered at the Crater of Diamonds State Park. The total carat weight of the stones was 58.72, with an average weight of 0.15 carats. Of these 383 diamonds, 5 weighed more than 1 carat. Diamonds recovered included 231 white, 90 brown, and 62 yellow. The largest stone recovered in 2004 was brown and weighed 3.10 carats. More than 22,000 diamonds have been recovered since this property became a State Park in 1972. Plans for the park include a new museum. In autumn of 2003, the park hosted the U.S. Mint's unveiling of the Arkansas State Quarter, which features a diamond at the center of the new reverse design. Construction of a new water park and adjacent visitor's facilities, including a classroom, were completed in 2004.

The AGC Web site at URL <http://www.state.ar.us/agc/agc.htm> hosted nearly 98,000 visitors in 2004, which was its 6th year of online operation; the number of visitors represented a 24% increase compared with that of 2003. Information posted on the Web site includes State resource data; USGS annual nonfuel mineral production data; publications and map ordering information; State stratigraphic, geologic and geohazard data; Arkansas Board of Registration for Professional Geologists; agency services; and news items. The site includes links to State agency services, Federal agencies, geology Web sites, organizations, and universities.

The AGC staff also prepared a spreadsheet database that contains all identified sites of mineral extraction in the State, excluding petroleum and natural gas. By the close of 2004, more than 7,200 entries had been made. Approximately 50% of those entries remain to be field checked. Sites are located by latitude and longitude and by general land office survey techniques.

The AGC has been an active participant in the STATEMAP program since 1995. STATEMAP is a component of the congressionally mandated 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. During 2004, three digitized 7.5-minute USGS topographic geologic maps were completed under the STATEMAP cooperative agreement, and three additional maps were started. Staff cartographers completed the digitization of an additional nine USGS 7.5-minute topographic geologic maps, primarily in southwestern Arkansas, with legends. An effort has been undertaken to digitize all or part of 10 USGS topographic geologic maps scaled 1:100,000 in west-central Arkansas. Additional information about the STATEMAP geologic mapping program in Arkansas can be found on the AGC Web site.

TABLE 1  
NONFUEL RAW MINERAL PRODUCTION IN ARKANSAS<sup>1,2</sup>

(Thousand metric tons and thousand dollars unless otherwise specified)

| Mineral   | 2002                |                      | 2003     |         | 2004     |         |
|---|---------------------|----------------------|----------|---------|----------|---------|
|   | Quantity            | Value                | Quantity | Value   | Quantity | Value   |
| Clays, common   | 922                 | 2,280                | 897      | 1,410   | 1,150    | 1,510   |
| Gemstones   | NA                  | 637                  | NA       | 477     | NA       | 590     |
| Sand and gravel, construction   | 8,810               | 45,600               | 9,720    | 52,100  | 9,370    | 53,500  |
| Silica stone <sup>3</sup> metric tons   | 386                 | 3,740                | 513      | 3,630   | 655      | 3,660   |
| Stone, crushed  | 30,600 <sup>r</sup> | 158,000 <sup>r</sup> | 29,700   | 145,000 | 32,900   | 161,000 |
| Combined values of bromine, cement, clays (kaolin),<br>gypsum (crude), lime, sand and gravel (industrial),<br>stone ([dimension limestone and sandstone), tripoli | XX                  | 247,000              | XX       | 252,000 | XX       | 298,000 |
| Total   | XX                  | 457,000 <sup>r</sup> | XX       | 454,000 | XX       | 518,000 |

<sup>r</sup>Revised. NA Not available. XX Not applicable.

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

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

<sup>3</sup>Grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.

TABLE 2  
ARKANSAS: CRUSHED STONE SOLD OR USED, BY KIND<sup>1</sup>

| Kind                    | 2002               |                                 |                       |                     | 2003               |                                 |                   |            | 2004               |                                 |                   |            |
|-------------------------|--------------------|---------------------------------|-----------------------|---------------------|--------------------|---------------------------------|-------------------|------------|--------------------|---------------------------------|-------------------|------------|
|                         | 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               | 26 <sup>r</sup>    | 7,860 <sup>r</sup>              | \$41,200 <sup>r</sup> | \$5.25 <sup>r</sup> | 25                 | 8,820                           | \$42,700          | \$4.85     | 27                 | 10,500                          | \$48,300          | \$4.59     |
| Dolomite                | 2                  | W                               | W                     | 5.35                | 2                  | W                               | W                 | 5.18       | 2                  | W                               | W                 | 5.19       |
| Granite                 | 5 <sup>r</sup>     | 9,400                           | 51,500                | 5.48                | 5                  | 9,460                           | 44,400            | 4.70       | 5                  | 9,620                           | 45,200            | 4.70       |
| Sandstone and quartzite | 18 <sup>r</sup>    | 10,300 <sup>r</sup>             | 49,600 <sup>r</sup>   | 4.83 <sup>r</sup>   | 17                 | 9,320                           | 47,100            | 5.05       | 19                 | 10,500                          | 56,100            | 5.33       |
| Slate                   | 1                  | W                               | W                     | 4.52                | 1                  | W                               | W                 | 4.41       | 1                  | W                               | W                 | 4.41       |
| Miscellaneous stone     | 3                  | W                               | W                     | 4.63                | 3                  | W                               | W                 | 4.68       | 3                  | W                               | W                 | 4.82       |
| Total or average        | XX                 | 30,600 <sup>r</sup>             | 158,000 <sup>r</sup>  | 5.16                | XX                 | 29,700                          | 145,000           | 4.87       | XX                 | 32,900                          | 161,000           | 4.89       |

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

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

TABLE 3a  
ARKANSAS: CRUSHED STONE SOLD OR USED BY PRODUCERS  
IN 2003, BY USE<sup>1</sup>

| Use  | Quantity<br>(thousand<br>metric tons) | Value<br>(thousands) | Unit<br>value |
|--|---------------------------------------|----------------------|---------------|
| <b>Construction:</b>                                   |                                       |                      |               |
| <b>Coarse aggregate (+1½ inch):</b>                    |                                       |                      |               |
| Riprap and jetty stone                                 | 107                                   | \$685                | \$6.40        |
| Filter stone   | W                                     | W                    | 5.24          |
| Other coarse aggregates                                | 282                                   | 1,690                | 5.99          |
| <b>Total or average</b>                                | <b>389</b>                            | <b>2,370</b>         | <b>6.10</b>   |
| <b>Coarse aggregate, graded:</b>                       |                                       |                      |               |
| Concrete aggregate, coarse                             | 452                                   | 2,820                | 6.25          |
| Bituminous aggregate, coarse                           | (2)                                   | (2)                  | 6.28          |
| Bituminous surface-treatment aggregate                 | (2)                                   | (2)                  | 7.85          |
| Railroad ballast                                       | (2)                                   | (2)                  | 3.80          |
| Other graded coarse aggregates                         | 1,080                                 | 7,460                | 6.93          |
| <b>Total or average</b>                                | <b>1,530</b>                          | <b>10,300</b>        | <b>6.73</b>   |
| <b>Fine aggregate (-¾ inch):</b>                       |                                       |                      |               |
| Stone sand, bituminous mix or seal                     | (3)                                   | (3)                  | 5.52          |
| Screening, undesignated                                | 490                                   | 1,980                | 4.04          |
| Other fine aggregates                                  | 194                                   | 1,290                | 6.64          |
| <b>Total or average</b>                                | <b>684</b>                            | <b>3,270</b>         | <b>4.78</b>   |
| <b>Coarse and fine aggregates:</b>                     |                                       |                      |               |
| Graded road base or subbase                            | 2,480                                 | 14,500               | 5.83          |
| Unpaved road surfacing                                 | (4)                                   | (4)                  | 7.66          |
| Crusher run (select material or fill)                  | (4)                                   | (4)                  | 3.80          |
| Roofing granules                                       | (4)                                   | (4)                  | 4.41          |
| Other coarse and fine aggregates                       | 4,300                                 | 19,900               | 4.62          |
| <b>Total or average</b>                                | <b>6,780</b>                          | <b>34,300</b>        | <b>5.06</b>   |
| Other construction materials                           | 56                                    | 168                  | 3.00          |
| <b>Agricultural:</b>                                   |                                       |                      |               |
| Limestone  | 284                                   | 1,530                | 5.40          |
| Poultry grit and mineral food                          | (5)                                   | (5)                  | 11.81         |
| Other agricultural uses                                | 81                                    | 877                  | 10.83         |
| <b>Total or average</b>                                | <b>365</b>                            | <b>2,410</b>         | <b>6.60</b>   |
| <b>Chemical and metallurgical:</b>                     |                                       |                      |               |
| Cement manufacture                                     | (6)                                   | (6)                  | 1.41          |
| Lime manufacture                                       | (6)                                   | (6)                  | 4.19          |
| Glass manufacture                                      | (6)                                   | (6)                  | 10.46         |
| <b>Total or average</b>                                | <b>1,830</b>                          | <b>3,930</b>         | <b>2.15</b>   |
| <b>Special:</b>  |                                       |                      |               |
| Asphalt fillers or extenders                           | (7)                                   | (7)                  | 14.98         |
| Other fillers or extenders                             | (7)                                   | (7)                  | 12.08         |
| Other miscellaneous uses and specified uses not listed | 1                                     | 5                    | 5.00          |
| <b>Unspecified:<sup>8</sup></b>                        |                                       |                      |               |
| Reported   | 10,600                                | 51,700               | 4.88          |
| Estimated  | 7,300                                 | 34,000               | 4.68          |
| <b>Total or average</b>                                | <b>17,900</b>                         | <b>86,100</b>        | <b>4.80</b>   |
| <b>Grand total or average</b>                          | <b>29,700</b>                         | <b>145,000</b>       | <b>4.87</b>   |

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

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

<sup>2</sup>Withheld to avoid disclosing company proprietary data; included with "Other graded coarse aggregates."

<sup>3</sup>Withheld to avoid disclosing company proprietary data; included with "Other fine aggregates."

<sup>4</sup>Withheld to avoid disclosing company proprietary data; included with "Other coarse and fine aggregates."

<sup>5</sup>Withheld to avoid disclosing company proprietary data; included with "Other agricultural uses."

<sup>6</sup>Withheld to avoid disclosing company proprietary data; included in "Total or average."

<sup>7</sup>Withheld to avoid disclosing company proprietary data; included in "Grand total or average."

<sup>8</sup>Reported and estimated production without a breakdown by end use.

TABLE 3b  
ARKANSAS: CRUSHED STONE SOLD OR USED BY PRODUCERS  
IN 2004, BY USE<sup>1</sup>

| Use  | Quantity<br>(thousand<br>metric tons) | Value<br>(thousands) | Unit<br>value |
|--|---------------------------------------|----------------------|---------------|
| <b>Construction:</b>                                   |                                       |                      |               |
| <b>Coarse aggregate (+1½ inch):</b>                    |                                       |                      |               |
| Riprap and jetty stone                                 | 139                                   | \$843                | \$6.06        |
| Filter stone   | 140                                   | 765                  | 5.46          |
| Other coarse aggregates                                | 92                                    | 554                  | 6.02          |
| Total or average                                       | 371                                   | 2,160                | 5.83          |
| <b>Coarse aggregate, graded:</b>                       |                                       |                      |               |
| Concrete aggregate, coarse                             | 1,010                                 | 6,660                | 6.59          |
| Bituminous aggregate, coarse                           | 142                                   | 815                  | 5.75          |
| Bituminous surface-treatment aggregate                 | W                                     | W                    | 7.46          |
| Railroad ballast                                       | W                                     | W                    | 5.76          |
| Other graded coarse aggregates                         | 1,090                                 | 7,430                | 6.84          |
| Total or average                                       | 2,240                                 | 14,900               | 6.66          |
| <b>Fine aggregate (-¾ inch):</b>                       |                                       |                      |               |
| Stone sand, concrete                                   | (2)                                   | (2)                  | 5.14          |
| Stone sand, bituminous mix or seal                     | 70                                    | 467                  | 6.62          |
| Screening, undesignated                                | 473                                   | 2,080                | 4.40          |
| Other fine aggregates                                  | 427                                   | 2,520                | 5.89          |
| Total or average                                       | 970                                   | 5,070                | 5.22          |
| <b>Coarse and fine aggregates:</b>                     |                                       |                      |               |
| Graded road base or subbase                            | 3,740                                 | 21,500               | 5.77          |
| Unpaved road surfacing                                 | 60                                    | 502                  | 8.34          |
| Crusher run or fill or waste                           | (3)                                   | (3)                  | 5.41          |
| Roofing granules                                       | (3)                                   | (3)                  | 4.41          |
| Other coarse and fine aggregates                       | 4,230                                 | 19,500               | 4.60          |
| Total or average                                       | 8,030                                 | 41,500               | 5.17          |
| Other construction materials                           | 38                                    | 164                  | 4.34          |
| <b>Agricultural:</b>                                   |                                       |                      |               |
| Limestone  | 119                                   | 649                  | 5.45          |
| Other agricultural uses                                | 10                                    | 47                   | 4.70          |
| Total or average                                       | 129                                   | 696                  | 5.40          |
| Other miscellaneous uses and specified uses not listed | 1                                     | 4                    | 4.00          |
| <b>Unspecified:<sup>4</sup></b>                        |                                       |                      |               |
| Reported   | 12,600                                | 56,200               | 4.46          |
| Estimated  | 8,500                                 | 40,000               | 4.70          |
| Total or average                                       | 21,100                                | 96,400               | 4.56          |
| Grand total or average                                 | 32,900                                | 161,000              | 4.89          |

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

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

<sup>2</sup>Withheld to avoid disclosing company proprietary data; included with "Other fine aggregates."

<sup>3</sup>Withheld to avoid disclosing company proprietary data; included with "Other coarse and fine aggregates."

<sup>4</sup>Reported and estimated production without a breakdown by end use.



TABLE 4a  
ARKANSAS: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2003,  
BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

| Use                                      | District 1 |        | District 2 |        | District 3 |       |
|--|------------|--------|------------|--------|------------|-------|
|  | Quantity   | Value  | Quantity   | Value  | Quantity   | Value |
| Construction:                            |            |        |            |        |            |       |
| Coarse aggregate (+1½ inch) <sup>2</sup> | 345        | 2,190  | W          | W      | (3)        | W     |
| Coarse aggregate, graded <sup>4</sup>    | 1,520      | 10,200 | W          | W      | W          | W     |
| Fine aggregate (-¾ inch) <sup>5</sup>    | 643        | 3,200  | W          | W      | W          | W     |
| Coarse and fine aggregate <sup>6</sup>   | 3,220      | 17,100 | W          | W      | W          | W     |
| Other construction materials             | 46         | 139    | 10         | 29     | --         | --    |
| Agricultural <sup>7</sup>                | 365        | 2,410  | --         | --     | --         | --    |
| Chemical and metallurgical <sup>8</sup>  | W          | W      | W          | W      | --         | --    |
| Special <sup>9</sup>                     | W          | W      | --         | --     | --         | --    |
| Other miscellaneous uses                 | --         | --     | 1          | 5      | --         | --    |
| Unspecified: <sup>10</sup>               |            |        |            |        |            |       |
| Reported                                 | 7,110      | 34,800 | 3,480      | 16,900 | --         | --    |
| Estimated                                | 2,500      | 11,000 | 4,800      | 23,000 | --         | --    |
| Total                                    | 16,300     | 85,100 | 13,400     | 59,600 | 10         | 124   |

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

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

<sup>2</sup>Includes filter stone, riprap and jetty stone, and other coarse aggregates.

<sup>3</sup>Less than ½ unit.

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

<sup>5</sup>Includes screening (undesignated), stone sand (bituminous mix or seal), and other fine aggregates.

<sup>6</sup>Includes crusher run (select material or fill), graded road base or subbase, unpaved road surfacing, roofing granules, and other coarse and fine aggregates.

<sup>7</sup>Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

<sup>8</sup>Includes cement, glass, and lime manufacture.

<sup>9</sup>Includes asphalt fillers or extenders and other fillers and extenders.

<sup>10</sup>Reported and estimated production without a breakdown by end use.

TABLE 4b  
ARKANSAS: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2004,  
BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

| Use                                      | District 1 |        | District 2 |        | District 3 |       |
|--|------------|--------|------------|--------|------------|-------|
|  | Quantity   | Value  | Quantity   | Value  | Quantity   | Value |
| Construction:                            |            |        |            |        |            |       |
| Coarse aggregate (+1½ inch) <sup>2</sup> | W          | W      | W          | W      | W          | W     |
| Coarse aggregate, graded <sup>3</sup>    | 2,220      | 14,800 | W          | W      | W          | W     |
| Fine aggregate (-¾ inch) <sup>4</sup>    | W          | W      | W          | W      | --         | --    |
| Coarse and fine aggregate <sup>5</sup>   | 4,380      | 23,500 | W          | W      | W          | W     |
| Other construction materials             | 25         | 120    | 13         | 44     | --         | --    |
| Agricultural <sup>6</sup>                | 129        | 696    | --         | --     | --         | --    |
| Other miscellaneous uses <sup>7</sup>    | --         | --     | 1          | 4      | --         | --    |
| Unspecified: <sup>8</sup>                |            |        |            |        |            |       |
| Reported                                 | 7,480      | 36,600 | 5,130      | 19,600 | --         | --    |
| Estimated                                | 3,500      | 16,000 | 5,000      | 24,000 | --         | --    |
| Total                                    | 19,000     | 98,500 | 13,900     | 62,300 | 9          | 103   |

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

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

<sup>2</sup>Includes filter stone, riprap and jetty stone, and other coarse aggregates.

<sup>3</sup>Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregates.

<sup>4</sup>Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregates.

<sup>5</sup>Includes crusher run or fill or waste, graded road base or subbase, unpaved road surfacing, roofing granules, and other coarse and fine aggregates.

<sup>6</sup>Includes agricultural limestone and other agricultural uses.

<sup>7</sup>Includes other specified uses not listed.

<sup>8</sup>Reported and estimated production without a breakdown by end use.

TABLE 5a  
 ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2003,  
 BY MAJOR USE CATEGORY<sup>1</sup>

| Use   | Quantity<br>(thousand<br>metric tons) | Value<br>(thousands) | Unit<br>value |
|---|---------------------------------------|----------------------|---------------|
| Concrete aggregate and concrete products <sup>2</sup>       | 2,680                                 | \$15,800             | \$5.88        |
| Asphaltic concrete aggregates and other bituminous mixtures | 1,040                                 | 7,440                | 7.16          |
| Road base and coverings                                     | 383                                   | 1,680                | 4.39          |
| Fill  | 197                                   | 325                  | 1.65          |
| Other miscellaneous uses <sup>3</sup>                       | 100                                   | 1,180                | 11.80         |
| Unspecified: <sup>4</sup>                                   |                                       |                      |               |
| Reported  | 3,500                                 | 16,200               | 4.63          |
| Estimated   | 1,800                                 | 9,500                | 5.24          |
| Total   | 9,720                                 | 52,100               | 5.36          |

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

<sup>2</sup>Includes plaster and gunite sands.

<sup>3</sup>Includes snow and ice control.

<sup>4</sup>Reported and estimated production without a breakdown by end use.

TABLE 5b  
 ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004,  
 BY MAJOR USE CATEGORY<sup>1</sup>

| Use   | Quantity<br>(thousand<br>metric tons) | Value<br>(thousands) | Unit<br>value |
|---|---------------------------------------|----------------------|---------------|
| Concrete aggregate (including concrete sand) <sup>2</sup>   | 2,520                                 | \$15,600             | \$6.19        |
| Asphaltic concrete aggregates and other bituminous mixtures | 458                                   | 3,620                | 7.91          |
| Road base and coverings                                     | 300                                   | 1,560                | 5.20          |
| Fill  | 65                                    | 266                  | 4.12          |
| Other miscellaneous uses <sup>3</sup>                       | 72                                    | 1,380                | 19.18         |
| Unspecified: <sup>4</sup>                                   |                                       |                      |               |
| Reported  | 4,140                                 | 22,000               | 5.31          |
| Estimated   | 1,800                                 | 9,000                | 4.98          |
| Total   | 9,370                                 | 53,500               | 5.70          |

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

<sup>2</sup>Includes plaster and gunite sands.

<sup>3</sup>Includes snow and ice control and filtration.

<sup>4</sup>Reported and estimated production without a breakdown by end use.

TABLE 6a

ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2003, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

| Use   | District 1 |        | District 2 |        | District 3 |        |
|---|------------|--------|------------|--------|------------|--------|
|   | Quantity   | Value  | Quantity   | Value  | Quantity   | Value  |
| Concrete aggregate and concrete products <sup>2</sup> | 309        | 2,070  | 1,450      | 8,890  | 929        | 4,830  |
| Asphaltic concrete aggregates and road base materials | W          | W      | 318        | 2,210  | W          | W      |
| Road base and coverings                               | --         | --     | 157        | 1,040  | 227        | 647    |
| Fill  | 46         | 120    | 131        | 174    | 20         | 31     |
| Other miscellaneous uses <sup>3</sup>                 | 54         | 381    | 57         | 910    | 710        | 5,120  |
| Unspecified: <sup>4</sup>                             |            |        |            |        |            |        |
| Reported  | 1,730      | 7,420  | 1,770      | 8,760  | --         | --     |
| Estimated   | 450        | 2,400  | 1,100      | 5,600  | 300        | 1,500  |
| Total   | 2,590      | 12,400 | 4,950      | 27,600 | 2,180      | 12,100 |

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

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.<sup>2</sup>Includes plaster and gunite sands.<sup>3</sup>Includes snow and ice control.<sup>4</sup>Reported and estimated production without a breakdown by end use.

TABLE 6b

ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

| Use  | District 1 |        | District 2 |        | District 3 |        |
|--|------------|--------|------------|--------|------------|--------|
|  | Quantity   | Value  | Quantity   | Value  | Quantity   | Value  |
| Concrete aggregates (including concrete sand) <sup>2</sup> | 264        | 1,860  | 1,320      | 8,520  | 933        | 5,230  |
| Asphaltic concrete aggregates and road base materials      | W          | W      | W          | W      | 148        | 1,470  |
| Road base and coverings                                    | --         | --     | 173        | 1,140  | 128        | 420    |
| Fill   | 11         | 101    | 33         | 126    | 20         | 39     |
| Other miscellaneous uses <sup>3</sup>                      | 26         | 201    | 354        | 3,320  | 2          | 5      |
| Unspecified: <sup>4</sup>                                  |            |        |            |        |            |        |
| Reported   | 1,480      | 6,890  | 1,610      | 8,490  | 1,060      | 6,610  |
| Estimated  | 480        | 2,400  | 1,100      | 5,500  | 200        | 1,100  |
| Total  | 2,260      | 11,500 | 4,620      | 27,100 | 2,490      | 14,900 |

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

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.<sup>2</sup>Includes plaster and gunite sands.<sup>3</sup>Includes filtration and snow and ice control.<sup>4</sup>Reported and estimated production without a breakdown by end use.