

# THE MINERAL INDUSTRY OF ARKANSAS

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 Arkansas Geological Commission for collecting information on all nonfuel minerals.

Arkansas remained 30th among the States in total nonfuel mineral value<sup>1</sup> in 1994, according to the U.S. Bureau of Mines (USBM). The estimated value for 1994 was \$392 million, nearly a 13% increase compared with that of 1993. This followed a 14% decrease in 1993 from that of 1992. The State accounted for more than 1% of the U.S. total value. Considerably higher values for bromine and crushed stone plus a moderate increase for construction sand and gravel value were responsible for most of the State's rising mineral value in 1994, while a decline in the first two mineral commodities was the major reason for the decrease in total value the previous year. Compared with 1993, the mineral commodity values increased for the following: bromine, crushed stone, construction sand and gravel, gypsum, lime, kaolin, dimension stone, and talc and pyrophyllite. Decreases occurred in portland cement, industrial sand and gravel, gemstones, common clays, and masonry cement.

Based on a comparison of USBM-estimated quantities of minerals produced in the United States during 1994, Arkansas continued to be the leading bromine-producing State, accounting for a large majority of U.S. production.

Michigan was the only other State producing the element. Mining operations in both States extracted subsurface bromine-rich natural brines by submersible pump for subsequent processing. Arkansas remained a leading abrasives-producing State, and was first in the production of whetstones. The State also remained fourth in kaolin clay production, seventh in talc and pyrophyllite, and ninth in gypsum. Arkansas rose from 5th to 4th in fire clay-production, while continuing as the 10th largest common clay-producing State. Because of the difficulty in establishing a common physical unit that properly measures quantities of gemstones produced, gem production is measured in dollars. By value, Arkansas was the second leading gemstone-producing State. Arkansas' mines produced significant quantities of crushed stone, both construction and industrial sand and gravel, and dimension stone, while significant quantities of portland cement were produced at manufacturing plants within the State. The State's mines exclusively produced industrial minerals; no metal mining has been reported in Arkansas since 1991, when bauxite and vanadium ore mining ceased following decades of metal mine production in the State. The State's

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

Mineral	1992		1993		1994 <sup>p</sup>	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Abrasives <sup>2</sup> metric tons	W	W	W	W	NA	NA
Bromine <sup>e</sup> do.	171,000	\$170,000	177,000	\$123,000	W	W
Clays <sup>3</sup> thousand metric tons	837	2,972	1,026	2,357	1,145	\$2,310
Gemstones	NA	1,493	NA	5,532	NA	5,290
Sand and gravel:						
Construction thousand metric tons	9,896	39,627	<sup>e</sup> 10,100	<sup>e</sup> 40,900	11,000	45,600
Industrial do.	<sup>h</sup> 806	10,458	642	7,597	W	W
Stone (crushed) <sup>4</sup> do.	<sup>e</sup> 22,861	118,900	21,706	102,555	<sup>e</sup> 23,500	<sup>e</sup> 114,000
Other <sup>5</sup>	XX	<sup>h</sup> 60,372	XX	<u>65,140</u>	XX	<u>224,000</u>
Total	XX	<sup>h</sup> 403,822	XX	347,081	XX	<sup>h</sup> 392,000

<sup>1</sup>Estimated. <sup>p</sup>Preliminary. <sup>r</sup>Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

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

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

<sup>4</sup>Excludes certain clays; kind and value included with "Combined value" data.

<sup>5</sup>Excludes certain stones; kind and value included with "Combined value" data.

<sup>e</sup>Combined value of cement, clays (fire, kaolin), gypsum (crude), lime, stone [crushed dolomite and quartzite (1993-94), crushed dolomite and traprock (1992) dimension], talc and pyrophyllite (1993-94), tripoli (1992-93), and values indicated by symbol W.

<sup>h</sup>Data do not add to total shown because of independent rounding.

metal production, mostly raw steel, resulted from materials received from other domestic and foreign sources.

According to the Arkansas Geological Commission (AGC), diamond exploration work by several companies in Crater of Diamonds State Park remained suspended in 1994, awaiting issuance by the U.S. Department of the Interior (DOI) of a temporary variance to a previous agreement between DOI and the State. Issuance of a non-compliance use permit would allow for exploration in the park for a limited period of time. A number of years ago, DOI allocated funds to the State for park improvements at Crater of Diamonds under an agreement that the State comply with a restriction against commercial mining in the park. In 1993, following several years of intermittent exploratory drilling, the exploration companies proposed to dig about 30 trenches across a 32.4-hectare (about an 81-acre) pipe outcrop to recover a targeted 1,000 carats of diamonds for evaluation. (A pipe is a cylindrically shaped, somewhat vertical ore body; an outcrop is the natural or man-made occurrence of a rock formation at the earth's surface.) Opponents claimed that exploration activities, apparent precursors to the potential mining of park lands, violated Federal Law. On leased land northeast of the park, Texas Star Resources Corp., a diamond exploration company based in Houston, TX, assembled a 10-ton-per-day testing plant, acquired by the company from Africa, and began processing diamondiferous rock.

In other mineral commodity developments, Ethyl Corp. (Richmond, VA) spun-off its two chemical production facilities in Columbia County in southern Arkansas and renamed it Albemarle Corp. with its administrative offices in Baton Rouge, LA. Albemarle produced a variety of materials and chemicals, including bromine and bromine compounds. A 1993 lawsuit brought against MidState Construction and Materials Co. by the Arkansas Attorney General's office was dismissed as unprovable. Claims of

the company being a "nuisance" included complaints of excessive noise, local household damage due to blasting, and untimely blasting practices. Charges were unsubstantiated by the evidence presented in court and the company's daily activity records showed evidence of the company's claims of following proper procedures. The judgement was, in part, contingent upon MidState's agreement that it furnish the attorney general with activity records covering the subsequent 2 years. Herzog Co. sold its Hatton quarry operation in Polk County to Meredian, based in Engelwood, CO. Operations continued uninterrupted in the Hatton formation portion of the quarry. This thick, lense-shaped aggregate deposit of volcanic origin is a particularly good resource because the rock is less wearing and damaging to mining and crushing equipment than many of the other area aggregate deposits.

AGC geologists collected more than 700 rock samples throughout the Ouachita Mountains to analyze for mercury and other base metals. The sampling was done to assist in a State investigation of the possible sources of elevated mercury in large predator fish from the Ouachita and Saline Rivers. State geologists also received funding from the U.S. Geological Survey to map a Cretaceous Period (65 to 135 million years ago) rock outcrop area in southwestern Arkansas with a particular interest in the industrial mineral deposits of sand, gravel, gypsum, and chalk, as well as ilmenite, the principal ore of the metal titanium, and celestite, the principal ore of the metallic element strontium. Mapping was underway and is to cover 58 7.5-minute quadrangles.

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<sup>1</sup>The term value, referring throughout this document to that of nonfuel minerals, here addresses the total monetary value as represented by either mine shipments, mineral commodity sales, or marketable production as is applicable to the individual mineral commodities.

TABLE 2  
**ARKANSAS: CRUSHED STONE<sup>1</sup> SOLD OR USED BY PRODUCERS IN 1993, BY USE**

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
<b>Coarse aggregate (+1 1/2 inch):</b>			
Macadam	W	W	\$2.43
Riprap and jetty stone	123	\$272	2.21
Filter stone	W	W	5.57
Other coarse aggregates	118	501	4.25
<b>Coarse aggregate, graded:</b>			
Concrete aggregate, coarse	855	2,571	3.01
Bituminous aggregate, coarse	680	3,359	4.94
Bituminous surface-treatment aggregate	288	719	2.50
Railroad ballast	129	W	W
<b>Fine aggregate (-3/8 inch):</b>			
Stone sand, concrete	W	W	6.78
Stone sand, bituminous mix or seal	W	W	6.05
Screening, undesignated	470	641	1.36
<b>Coarse and fine aggregates:</b>			
Graded road base or subbase	2,939	10,666	3.63
Unpaved road surfacing	W	W	3.16
Crusher run or fill or waste	109	539	4.94
Other coarse and fine aggregates	69	98	1.42
Other construction materials	839	3,094	3.69
Roofing granules	W	W	8.38
Agriculture: Agricultural limestone <sup>2</sup>	156	1,600	10.26
<b>Special:</b>			
Mine dusting or acid water treatment	(3)	(3)	6.59
Asphalt fillers or extenders	(3)	(3)	12.23
Other fillers or extenders	(3)	(3)	14.23
Other specified uses not listed	224	2,701	12.06
<b>Unspecified:<sup>4</sup></b>			
Actual	8,046	37,452	4.65
Estimated	<u>6,662</u>	<u>38,344</u>	<u>5.76</u>
Total <sup>5</sup>	21,706	102,555	4.72
Total <sup>6,7</sup>	23,927	102,555	4.29

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

<sup>1</sup>Includes granite, limestone, miscellaneous stone, quartzite, sandstone, and traprock; excludes dolomite; also excludes values for quartzite and traprock from State total to avoid disclosing company proprietary data.

<sup>2</sup>Includes poultry grit and mineral food, and other agricultural uses.

<sup>3</sup>Included with "Other specified uses not listed."

<sup>4</sup>Includes production reported without a breakdown by use and estimates for nonrespondents.

<sup>5</sup>Data may not add to totals shown because of independent rounding.

<sup>6</sup>One short ton is equal to 907 kilograms or 2,000 pounds. To convert metric tons to short tons, divide metric tons by 0.907185.

<sup>7</sup>Total shown in thousand short tons and thousand dollars.

TABLE 3  
**ARKANSAS: CRUSHED STONE SOLD OR USED, BY KIND**

Kind	1991				1993			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	'19	'5,475	'\$24,566	\$4.49	18	5,999	\$30,471	\$5.08
Dolomite	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Granite	8	8,962	49,296	5.50	8	7,888	41,472	5.26
Traprock	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1	760	( <sup>2</sup> )	( <sup>2</sup> )
Sandstone	'16	'4,150	'18,936	4.56	15	4,676	20,358	4.35
Quartzite	—	—	—	—	1	786	( <sup>2</sup> )	( <sup>2</sup> )
Miscellaneous stone	7	1,497	8,629	5.76	6	1,598	10,255	6.42
Total <sup>3</sup>	XX	'20,084	'101,428	5.05	XX	21,706	102,555	4.72
Total <sup>4 5</sup>	XX	'22,139	'101,428	4.58	XX	23,927	102,555	4.29

<sup>1</sup>Revised. XX Not applicable.

<sup>2</sup>Excludes dolomite and traprock from State total to avoid disclosing company proprietary data.

<sup>3</sup>Excludes values for quartzite and traprock from State total to avoid disclosing company proprietary data.

<sup>4</sup>Data may not add to totals shown because of independent rounding.

<sup>5</sup>One short ton is equal to 907 kilograms or 2,000 pounds. To convert metric tons to short tons, divide metric tons by 0.907185.

<sup>6</sup>Total shown in thousand short tons and thousand dollars.

TABLE 4  
**ARKANSAS: CRUSHED STONE<sup>1</sup> SOLD OR USED BY PRODUCERS IN 1993, BY USE AND DISTRICT**

(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregate (+1 1/2 inch) <sup>2</sup>	W	W	W	W
Coarse aggregate, graded <sup>3</sup>	W	W	W	W
Fine aggregate (-3/8 inch) <sup>4</sup>	W	W	W	W
Coarse and fine aggregate <sup>5</sup>	2,147	8,666	1,131	3,739
Other construction materials	1,459	6,724	1,881	3,330
Agricultural <sup>6</sup>	( <sup>7</sup> )	( <sup>7</sup> )	—	—
Special <sup>8</sup>	( <sup>7</sup> )	( <sup>7</sup> )	—	—
Other miscellaneous uses	380	4,301	—	—
Unspecified: <sup>9</sup>				
Actual	3,459	18,250	4,586	19,203
Estimated	1,132	5,386	5,530	32,957
Total <sup>10</sup>	8,577	43,326	13,129	59,229
Total <sup>11 12</sup>	9,455	43,326	14,472	59,229

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

<sup>1</sup>Excludes dolomite and values for quartzite and traprock from State total to avoid disclosing company proprietary data.

<sup>2</sup>Includes macadam, riprap and jetty stone.

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

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

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

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

<sup>7</sup>Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."

<sup>8</sup>Includes mine dusting or acid water treatment, asphalt fillers or extenders, and other fillers or extenders.

<sup>9</sup>Includes production reported without a breakdown by use and estimates for non-respondents.

<sup>10</sup>Data may not add to totals shown because of independent rounding.

<sup>11</sup>One short ton is equal to 907 kilogram or 2,000 pounds. To convert metric tons to short tons, divide metric tons by 0.907185.

<sup>12</sup>Total shown in thousand short tons and thousand dollars.