THE MINERAL INDUSTRY OF TENNESSEE

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Tennessee Department of Environment and Conservation, Division of Geology, for collecting information on all nonfuel minerals.

In 2000, the estimated value[1] of nonfuel mineral production for Tennessee was $776 million, based upon preliminary U.S. Geological Survey (USGS) data. This was about a 1% increase from that of 1999[2] and followed a 9.1% increase from 1998 to 1999. Tennessee was 20th in rank (18th in 1999) among the 50 States in total nonfuel mineral production value, of which the State accounted for 2% of the U.S. total.

Crushed stone has been Tennessee's leading mineral commodity, by value, for more than 25 years, except for 1981 when zinc was first. In 2000, based upon preliminary data, crushed stone accounted for about 50% of the State's total nonfuel mineral production value. Zinc was the second leading nonfuel mineral, followed by portland cement, construction sand and gravel, and ball clay. In 1999, these rankings were the same, but zinc, with an increase of more than $35 million compared with that of 1998, had the greatest affect on the State's nonfuel mineral economy. Construction materials, inclusive of cement (masonry and portland), construction sand and gravel, and crushed stone, contributed a combined $20 million increase in the State's nonfuel mineral production value, and fuller's earth was up about $3 million. Nearly all nonfuel minerals showed increases in 1999, while the production and value of lime and the value of ball clay dropped slightly (table 1).

Compared with USGS estimates of the quantities produced in the 50 States in 2000, Tennessee remained the leading gemstone- and ball clay-producing State, 2d in zinc, 3d in barite, 10th in crushed stone, and a significant producer of industrial sand and gravel and common clays (descending order of value). Primary aluminum and raw steel were produced in Tennessee but were processed from materials obtained from other domestic and foreign sources. The State ranked ninth in the production of primary aluminum.

The Tennessee Division of Geology provided the following narrative information.[3] By the end of 2000, a total of 320 nonfuel mineral operations were registered in 82 counties across the State of Tennessee.

Ball clay was mined in four counties in northwest Tennessee by the Old Hickory Clay Co., H.C. Spinks Co., Unimin Corp. (United Clays Inc.), Gleason Brick Co., and Kentucky-Tennessee Clay Co. In March 2001, Hecla Mining Co. sold Kentucky-Tennessee Clay Co. to the Imerys Group. Unimin's Carroll County Mine also produced kaolinite. According to Unimin's web site at URL http://www.unitedclays.com/whatsnew.html, the company started a recycling program that generated a cost savings to customers and to the wall tile manufacturer that had to pay landfill fees to dispose of broken tile. The program used broken ceramic tile, which was processed and added as part of the calcine portion of raw soapstone/calcine soapstone blends.

General Shale Products Corp. operated nine clay mines in four counties in east Tennessee to supply its brick production plants. Fuller's earth was mined in Hardeman County by Moltan Co. and in Henry County by American Colloid Co.

Yates Construction Co. operated two barite mines in McMinn County. The open pit mines produced pharmaceutical-grade barite.

The Tennessee Division of Geology completed geologic mapping and Mineral Resource Summaries of the Cave Creek, Sweetwater, and Philadelphia quadrangles in the Sweetwater Barite District in east Tennessee.

Construction sand and gravel was produced at 94 sites in 30 counties that were operated by 64 different companies. Companies operating five or more sites included Ford Construction Co., Memphis Stone and Gravel Co., Standard Construction Co. in District 1 (west Tennessee), and Bradley Stone and Gravel Inc. in the eastern part of District 2 (middle Tennessee).

Tennessee's crushed stone industry extracts limestone and dolomite at 150 active quarries. The only exceptions (both in Johnson County) were Maymead Materials Inc. and Mountain City Stone Co., which produced crushed granite, and Doe Creek Quarry Inc., which produced crushed quartzite. Crushed limestone and dolomite were produced in 65 counties by 65 different companies, 18 of which were operated by county governments. The top three producers were (1) Vulcan Materials Co., which operated 35 quarries in 27 counties; (2) Rogers Group Inc., which operated 29 quarries in 26 counties; and (3) American Limestone Co., which operated 9 quarries in 5 counties.

Holston Marble was quarried for dimension stone in Blount County by the Tennessee Marble Co. and Tennessee Valley

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2000 USGS mineral production data published in this chapter are preliminary estimates as of July 2001 and are expected to change. For some mineral commodities, such as construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. A telephone listing of the specialists may be retrieved over the Internet at URL http://minerals.usgs.gov/minerals/contacts/comdir.html, by using MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset (request Document #1000 for a telephone listing of all mineral commodity specialists), or by calling USGS information at (703) 648-4000 for the specialist's name and number. All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL http://minerals.usgs.gov/minerals; facsimile copies may be obtained from MINES FaxBack.

[2]Values, percentage calculations, and rankings for 1999 may vary from the Minerals Yearbook, Area Reports: Domestic 1999, Volume II, owing to the revision of preliminary 1999 to final 1999 data. Data for 2000 are preliminary and are expected to change; related rankings may also change.

[3]Peter Lemizki, Chief Geologist with the Tennessee Division of Geology in Knoxville, authored the text of mineral industry information submitted by that agency.

Marble Inc. Of historical interest was the completed renovation in 2000 of Grand Central Station in New York City, which used 57 cubic meters of Tennessee pink marble supplied by the Tennessee Marble Co. The Imperial Black Marble Co. produced marble from the Maryville Limestone in Grainger County. Quartzitic sandstone is quarried on the Cumberland Plateau for dimension sandstone, flagstone, and ashlar. Four companies operated five quarries in Cumberland, Bledsoe, Rhea, and Morgan Counties.

Benton County is the location of Tennessee's gem industry. The American Shell Co. and Tennessee Shell Co. harvested mollusk shells from the Tennessee River for seeds in the cultured pearl industry. The American Pearl Co. farmed pearls in the Tennessee River.

No mining has occurred in the Coker Creek gold district in Monroe County for many decades, but Coker Creek Village attracted tourists to pan for natural gold in Coker Creek. The pan-for-a-fee operation, however, was discontinued following the loss of the main structure due to a fire in 1999. Gold panning is still possible in Cherokee National Forest.

Gypsum was produced from Tennessee Valley Authority byproducts at the Allied Custom Gypsum plant in Stewart County.

Lime plants operated by Bowater Southern Paper Corp. in McMinn County produced high-calcium quicklime, and Global Stone Tenn-Luttrell Inc. in Union County produced high-calcium quicklime and hydrated lime.

Industrial sand was produced in east and west Tennessee. Short Mountain Silica Co. operated one mine in Hawkins County, and Unimin Corp. operated two mines in Benton County.

ASARCO Incorporated operated the Young, Immel, and Coy mines in Knox and Jefferson Counties. The New Market Mine was on standby status. The Young Mine and Coy Mine were relatively small producers of lead in the United States.

Pasminco Ltd. operated the electrolytic zinc plant in Clarksville (Montgomery County) and mines at Gordonsville, Cumberland, and Clinch Valley. The Clarksville Zinc Plant produced primary cadmium as a byproduct during roasting and leaching of the zinc concentrate. In Smith County, the Gordonsville Mine produced ore that yielded 45,000 metric tons per year of 64.5%-grade zinc concentrate. The mine was one of the largest sources of germanium in the world and also produced agricultural limestone, crushed stone, and masonry sand. The Clinch Valley Mine in Grainger County was reopened in July 2000.

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

(Thousand metric tons and thousand dollars)

Mineral	1998		1999 r/		2000 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, ball	712	30,100	725	30,100	756	31,600
Gemstones	NA	W	NA	W	NA	5,160
Sand and gravel:						
Construction	9,410	49,800	9,640	53,100	8,890	50,000
Industrial	999	17,100	W	W	W	W
Stone, crushed	63,600	370,000	63,100	382,000	63,000	391,000
Combined values of barite, cement, clays [fuller's earth, kaolin (1998-99)], copper (1998-99), lead, lime, salt, silver (1998-99), stone (dimension marble), zinc, and values indicated by symbol W	XX	237,000	XX	304,000	XX	298,000
Total	XX	705,000	XX	769,000	XX	776,000

p/ Preliminary. r/ Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "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
TENNESSEE: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1998				1999			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	111	56,800	$329,000	$5.80	108	56,500	$345,000	$6.10
Dolomite	10	W	W	6.05	9	W	W	5.62
Granite	1	W	W	4.96 r/	1	W	W	5.79
Sandstone	2	W	W	8.91	1	W	W	3.39
Total or average	XX	63,600	370,000	5.83	XX	63,100	382,000	6.05

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

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

TABLE 3
TENNESSEE: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 1999, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	985	$6,270	$6.36
Filter stone	693	4,160	6.00
Other coarse aggregate	687	3,670	5.35
Total or average	2,370	14,100	5.96
Coarse aggregate, graded:			
Concrete aggregate, coarse	3,420	19,300	5.65
Bituminous aggregate, coarse	12,500	79,600	6.39
Bituminous surface-treatment aggregate	1,400	8,760	6.24
Railroad ballast	490	2,580	5.27
Other graded coarse aggregate	3,450	24,200	7.02
Total or average	21,200	135,000	6.34
Fine aggregate (-3/8 inch):			
Stone sand, concrete	1,080	8,050	7.48
Stone sand, bituminous mix or seal	333	1,680	5.05
Screening, undesignated	3,290	21,600	6.58
Other fine aggregate	395	2,790	7.05
Total or average	5,090	34,200	6.71
Coarse and fine aggregates:			
Graded road base or subbase	13,100	72,000	5.48
Unpaved road surfacing	348	1,630	4.68
Crusher run or fill or waste	901	4,660	5.18
Roofing granules	W	W	6.11
Other coarse and fine aggregates	1,890	11,900	6.33
Total or average	16,300	90,200	5.54
Other construction materials	177	906	5.12
Agricultural:			
Agricultural limestone	(3/)	(3/)	6.11
Poultry grit and mineral food	(4/)	(4/)	(4/)
Chemical and metallurgical:			
Cement manufacture	(3/)	(3/)	3.39
Lime manufacture	(3/)	(3/)	15.05
Chemical stone for alkali works	(3/)	(3/)	4.67
Sulfur oxide removal	(3/)	(3/)	5.51
Special:			
Mine dusting or acid water treatment	(3/)	(3/)	23.70
Whiting or whiting substitute	(3/)	(3/)	11.31
Other fillers or extenders	(3/)	(3/)	13.85
Unspecified: 5/			
Reported	8,030	45,900	5.72
Estimated	7,300	42,000	5.79
Total or average	15,300	88,100	5.75
Grand total or average	63,100	382,000	6.05

W Withheld to avoid disclosing company proprietary data; included with "Other."
1/ Includes dolomite, granite, limestone, and sandstone.
2/ Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
3/ Withheld to avoid disclosing company proprietary data; included in "Grand total."
4/ Less than ½ unit.
5/ Reported and estimated production without a breakdown by end use.

TABLE 4
TENNESSEE: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1999,
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 (+1 1/2 inch) 2/	W	W	W	W	W	W
Coarse aggregate, graded 3/	W	W	W	W	W	W
Fine aggregate (-3/8 inch) 4/	W	W	W	W	W	W
Coarse and fine aggregate 5/	W	W	W	W	W	W
Other construction materials	--	--	177	906	--	--
Agricultural 6/	W	W	W	W	W	W
Chemical and metallurgical 7/	--	--	W	W	W	W
Special 8/	--	--	--	--	W	W
Unspecified: 9/						
Reported	--	--	6,470	36,900	1,560	9,030
Estimated	--	--	5,000	29,000	2,300	13,000
Total	5,970	43,700	31,400	181,000	25,800	157,000

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 filter stone, riprap and jetty stone, and other coarse aggregate.
3/ Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregate.
4/ Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregates.
5/ Includes crusher run (select material or fill), graded road base or subbase, roofing granules, unpaved road surfacing, and other coarse and fine aggregates.
6/ Includes agricultural limestone and mineral food and poultry grit.
7/ Includes cement manufacture, chemical stone for alkali works, lime manufacture, and sulfur oxide removal.
8/ Includes acid water treatment or mine dusting, whiting or whiting substitute, and other fillers or extenders.
9/ Reported and estimated production without a breakdown by end use.

TABLE 5
TENNESSEE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	3,170	$18,800	$5.94
Concrete products (blocks, bricks, pipe, decorative, etc.)	427	3,090	7.23
Asphaltic concrete aggregates and other bituminous mixtures	1,340	7,490	5.61
Road base and coverings	1,100	5,330	4.84
Fill	311	1,360	4.37
Snow and ice control	W	W	5.50
Roofing granules	W	W	15.20
Other miscellaneous uses 2/	114	955	8.38
Unspecified: 3/			
Reported	1,260	7,980	6.36
Estimated	1,900	8,000	4.21
Total or average	9,640	53,100	5.50

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."
1/ Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
2/ Includes filtration.
3/ Reported and estimated production without a breakdown by end use.

TABLE 6
TENNESSEE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,
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)	1,950	11,600	W	W	W	W
Concrete products (blocks, bricks, pipe, decorative, etc.)	W	W	276	1,720	W	W
Asphaltic concrete aggregates and other bituminous mixtures	W	W	263	1,330	W	W
Road base and coverings	912	3,920	W	W	W	W
Fill	254	987	39	191	18	183
Snow and ice control	--	--	W	W	--	--
Roofing granules	--	--	--	--	W	W
Other miscellaneous uses 2/	1,120	6,290	1,110	5,780	525	5,050
Unspecified: 3/						
Reported	877	4,880	378	3,100	--	--
Estimated	1,600	6,000	1	20	300	2,000
Total	6,690	33,700	2,070	12,200	881	7,190

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 filtration.

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