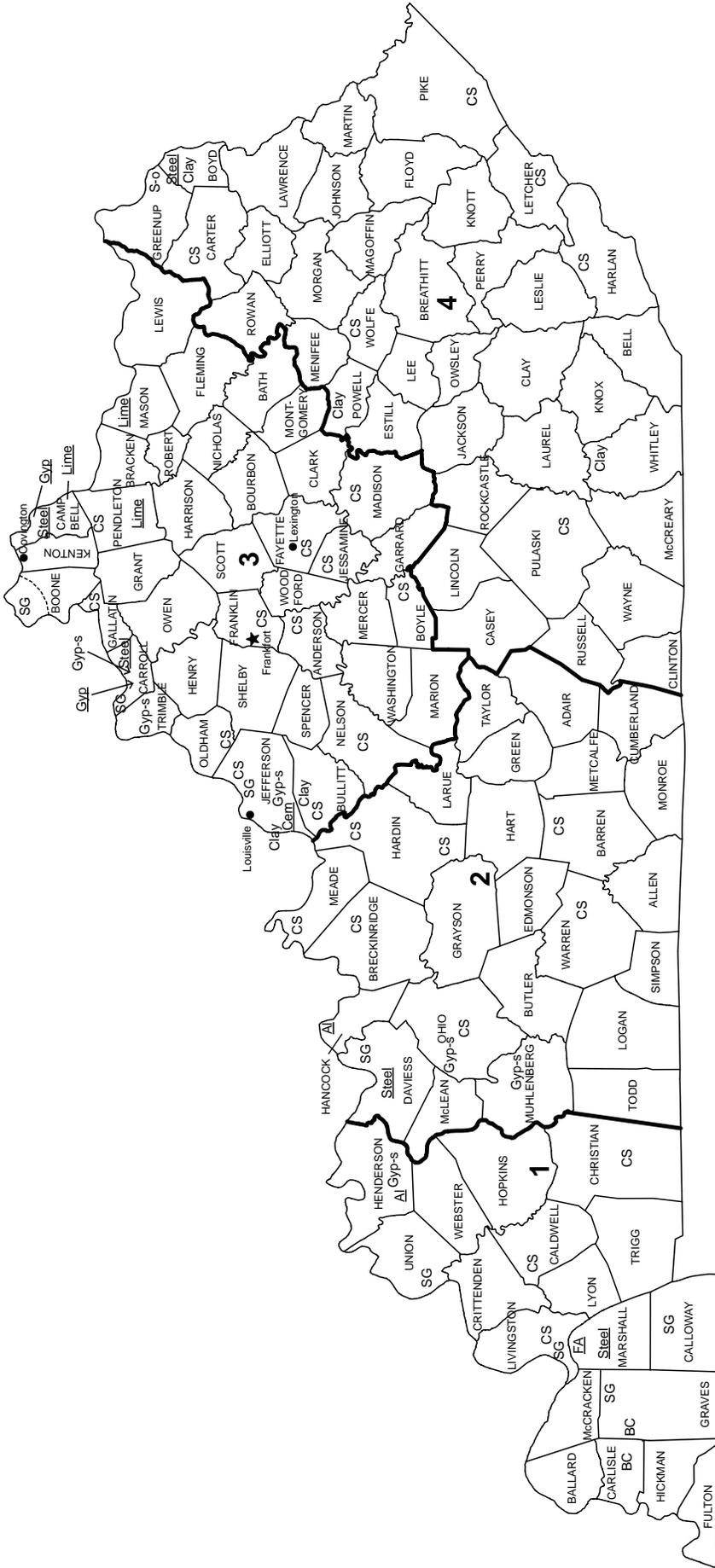




2005 Minerals Yearbook

KENTUCKY

KENTUCKY



LEGEND

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

MINERAL SYMBOL (Major producing areas)

EA	Ferrous plant	SG	Construction sand and gravel
Gyp	Gypsum plant	Steel	Steel plant
Gyp-s	Synthetic gypsum	○	Concentration of mineral operations
Lime	Lime plant		
S-o	Sulfur (oil)		

Al	Aluminum plant
BC	Ball clay
Cem	Cement plant
Clay	Common clay
CS	Crushed stone

THE MINERAL INDUSTRY OF KENTUCKY

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

In 2005, Kentucky's nonfuel raw mineral production was valued¹ at \$765 million, a 10.7% increase from that of 2004, based upon annual U.S. Geological Survey (USGS) data. This followed a 15.8% increase in the State's total nonfuel mineral production value for 2004 from 2003, which was up more than 10% from 2002. Kentucky was 27th in rank (25th in 2004) among the 50 States in total nonfuel mineral production value, accounting for nearly 1½% of the U.S. total. Yet, per capita, the State ranked 18th in the Nation in its minerals industry's value of nonfuel mineral production; with a population of about 4.2 million, the value of production was about \$180 per capita.

Crushed stone continued to be Kentucky's leading nonfuel mineral commodity in 2005 and accounted for 55% of the State's raw nonfuel mineral value. Lime was second, followed by cement (portland and masonry) and construction sand and gravel. These four mineral commodities accounted for nearly 98% of the State's total nonfuel mineral production value. In 2005, each of the four leading nonfuel mineral commodities rose in value. The value of crushed stone rose by \$37 million, up about 9.5% from that of 2004, although production decreased by more than 6%. With a relatively small increase in cement production, the commodity's value rose by about \$25 million. These increases were followed by progressively smaller yet significant increases in the values of lime and construction sand and gravel. Although having minimal effect on the State's total nonfuel mineral value, the value of gemstones was up 250% in 2005 from that of 2004 (table 1).

In 2005, Kentucky continued to rank 2d in the quantity of lime that was produced and 4th in ball clay among the other producing States, and it rose to 7th from 11th in the production of common clays. Additionally, the State produced significant quantities of crushed stone (11th), portland cement, and construction sand and gravel (descending order of value). Primary aluminum and raw steel were produced from materials obtained from other domestic and foreign sources. Kentucky remained the Nation's leading producer of primary aluminum.

The following narrative information was provided by the Kentucky Geological Survey² (KGS).

¹The 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 2005 USGS mineral production data published in this chapter are those available as of December 2006. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

²Warren H. Anderson, Geologist and Principal Investigator with the Kentucky Geological Survey, submitted the text of the State mineral industry information provided by that State agency.

Exploration Activities

In 2005 in a joint project, new fluorite exploration took place in the Western Kentucky Fluorspar District; Hastie Mining and Trucking Co. and Moodie Minerals Inc. conducted core drilling along the Klondike Mine area in Livingston County and reported significant shows of fluorspar along the fault systems. The two companies planned to continue core drilling to identify reserves necessary to justify the development and opening of a fluorspar mine. Since 1978 when Frontier Spar Corp. closed its Babb-Barnes underground mine and mill near Salem, Livingston County, no significant production of fluorspar has been reported in the State (Harrison and McGrain, 1981, p. 229). Intermittently, relatively small quantities have been processed from previously mined material and some exploration activities have taken place during the intervening years.

The KGS and the Department of Earth and Environmental Sciences (both of the University of Kentucky) continued to examine three dikes in the Coefield Creek ultramafic intrusive complex in Crittenden County. Alkaline lamprophyre dikes had tentatively been identified as Alnoite and research efforts focused on investigating the possibility of the dikes similarity to diamond-bearing lamprophyres of western Australia (Heck and others, 2006). Included in the study were samples from approximately 20 dikes in the region; further studies were aimed at identifying additional lamprophyre dikes.

Commodity Review

Industrial Minerals

Crushed Stone.—The Vulcan Materials Co. Grand Rivers Quarry (formerly Reed Quarry) in far western Kentucky (Paducah) continued to be the State's leading producing quarry, based upon total output of crushed stone and, based upon 2005 USGS data, was the seventh leading quarry in the United States.

Acquisition activity continued to be slow; instead many companies appeared to be upgrading existing plants and operations. The Rodgers Group Inc. invested \$8 million in a new system to process limestone at its Jefferson County Stone Quarry in Jefferson County (Markley, 2006). Vulcan Materials upgraded its Grand Rivers Quarry by installing \$20 million worth of new crushers and conveyors (Drake, 2005§³). Hanson Aggregates Midwest, Inc. installed an air separator to handle fines in its Tyrone Quarry operations in Lawrenceburg, in east central Kentucky (Constantino, 2004§).

³References that include a section mark (§) are found in the Internet References Cited section.

Environmental Issues—Recycling and Mine Reuse

Recycling

Gypsum and Aggregate.—Recycled waste products from industrial plants continued to find new markets in Kentucky operations. LaFarge Gypsum Co. in Campbell County and BPB Celotex in Carroll County continued to use synthetic scrubber gypsum from coal-fired powerplant byproducts to make gypsum wallboard (Greb and Anderson, 2006). Fly ash and bottom ash from the same coal-fired plants continued to be used as road aggregate and fill, yet the volume of the materials remained so great that most ash still was placed in landfills. Other construction and aggregate uses of these powerplant byproducts, such as uses in synthetic aggregates for concrete and asphalt, were considered to be a potentially useful future means for the disposing of the plants' additional byproducts.

Steel.—In October, AK Steel Corp. constructed a new recycling facility to process the plant's waste materials from the blast furnace, coke making, and continuous caster operations. The unit recovered carbon and iron in the form of briquettes, where they were used as feedstock for the first step in the steelmaking process (Greb and Anderson, 2006).

Mine Reuse, Partnering, and Technology

An abandoned underground limestone mine found new life as an underground Critical Infrastructure Protection facility for the storage of electronic data in Louisville, KY. The "e-Cavern" site is approximately 30 meters beneath Louisville and an interstate highway, and the site provides nearly 280,000 square meters (3 million square feet), or nearly 28 hectares, of underground limestone cavern space, for critical data processing and storage and communications facilities (e-Cavern Corp., undated§). The facility contained a state-of-the-art conference center, office space with full internet capability, and an underground café. Partnering with the University of Kentucky, the University of Louisville, and several major companies, e-Cavern, LLC, was designing, building, and storing electronic data in a secure environment for the financial, governmental, business, and military industries (Lightfoot, 2006§).

Government Issues

Transportation and weight limits for natural resource haulers continued to be an important issue during 2005. A bill to increase weight limits for aggregate and sand trucks on State roads was submitted to the Kentucky legislature in the fall of 2004. The bill followed the outgrowth of a lawsuit in an eastern Kentucky court, which challenged the current weight limit imposed on natural resource haulers because it differed from the limit for coal haulers. The current weight limit for hauling sand, gravel, and aggregate is 36 metric tons (t). Some road builders and truckers have lobbied to allow minerals other than coal to be transported at the same weight limits as coal, or 54 t, with an extended weight permit. Many city and county leaders, environmentalists, and truckers opposed the bill. In March

2005, a modified version of the bill passed the State Senate, but failed in the House, owing to the concern that the legislation would allow more overweight trucks on the road (Greb and Anderson, 2006).

Issues related to the Clean Water Act and the U.S. Army Corps of Engineers use of Nationwide Permit (NP) 21 in the mine permitting process have typically focused on coal mining, but industrial minerals mining is also affected. In Kentucky, NP 21 and NP 26 are used by the nonfuel mining industry for permitting. If either of these would be withdrawn for industrial minerals, the nonfuel mining industry would have to use NP 44, considered a more burdensome and complex permitting process. A November 2005 ruling of the Fourth Circuit U.S. Court of Appeals allowed noncoal mining companies to operate under NP 21 and NP 26 (Greb and Anderson, 2006).

The University of Kentucky continued research efforts into carbon sequestration issues and the effects on nearby underground limestone mining operations. Carbon dioxide (CO₂) injected into the ground is generally injected into deep sites which sequester the CO₂. Generally, the depth of sequestering sites is far deeper than any mine depth and the limited local radius of influence from the injection would unlikely interfere with underground mines.

During 2005, the KGS continued to compile a set of digital 30 x 60 1:100,000-scale maps for public distribution. The KGS planned to continue to release these maps by means of the KGS GeoPortal, an Internet map server. This Web site allows a user to download various types of geologic maps and data to create custom maps (<http://kgmap.uky.edu/website/KGSGeoPortal/KGSGeoPortal.asp>).

The KGS was in the initial stages of creating a minerals database that would be accessible by means of the Internet and be of value to the minerals industry. Currently, information on coal, oil, gas, and water resources in the State can be downloaded from the KGS Web site (<http://www.uky.edu/KGS/home.htm>) under "Internet Map Services." Once completed, the minerals database will have similar capabilities and make minerals information available for public distribution.

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TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN KENTUCKY^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2003		2004		2005	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	983	3,770	978	4,510	1,060	4,370
Gemstones	NA	22	NA	22	NA	78
Sand and gravel, construction	10,000	46,500	10,300	49,700	10,500	55,000
Stone, crushed	52,400	326,000	62,100 ^{r,3}	384,000 ^{r,3}	58,200 ³	421,000 ³
Combined values of cement, clays (ball), lime, stone (crushed dolomite [2004-05])	XX	220,000	XX	253,000 ^r	XX	285,000
Total	XX	597,000	XX	691,000 ^r	XX	765,000

^rRevised. NA Not available. XX Not applicable.

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

²Data are rounded to three significant digits; may not add to totals shown.

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

TABLE 2
KENTUCKY: CRUSHED STONE SOLD OR USED, BY KIND¹

Kind	2004			2005		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone ²	88 ^r	62,100	\$384,000	87	58,200	\$421,000
Dolomite	1	W	W	1	W	W
Total	XX	62,100 ^r	384,000 ^r	XX	58,200	421,000

^rRevised. W Withheld to avoid disclosing company proprietary data. XX Not applicable.

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

²Includes limestone-dolomite reported with no distinction between the two.

TABLE 3
KENTUCKY: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2005, BY USE¹

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Macadam	W	W
Riprap and jetty stone	237	1,900
Filter stone	215	1,390
Other coarse aggregates	1,090	7,590
Total	1,540	10,900
Coarse aggregate, graded:		
Concrete aggregate, coarse	1,250	9,340
Bituminous aggregate, coarse	4,360	32,900
Bituminous surface-treatment aggregate	(2)	(2)
Railroad ballast	(2)	(2)
Other graded coarse aggregates	3,030	21,900
Total	9,020	66,700
Fine aggregate (-¾ inch):		
Stone sand, concrete	(3)	(3)
Stone sand, bituminous mix or seal	405	3,140
Screening, undesignated	260	1,930
Other fine aggregates	3,240	18,100
Total	3,910	23,200
Coarse and fine aggregates:		
Graded road base or subbase	2,530	17,600
Unpaved road surfacing	1,800	16,000
Crusher run or fill or waste	(4)	(4)
Other coarse and fine aggregates	6,520	46,100
Total	10,900	79,700
Agricultural limestone	671	3,750
Chemical and metallurgical, lime manufacture	(5)	(5)
Other miscellaneous uses and specified uses not listed	32	220
Unspecified: ⁶		
Reported	11,900	90,200
Estimated	20,000	150,000
Total	32,100	236,000
Grand total	58,200	421,000

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

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

²Withheld to avoid disclosing company proprietary data; included in "Total."

³Withheld to avoid disclosing company proprietary data; included with "Other fine aggregate."

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

⁵Withheld to avoid disclosing company proprietary data; included in "Unspecified: Reported."

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

TABLE 4
KENTUCKY: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2005, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1½ inch) ²	W	W	465	3,480	W	W	W	W
Coarse aggregate, graded ³	W	W	3,290	24,600	W	W	W	W
Fine aggregate (-¾ inch) ⁴	W	W	W	W	1,720	7,870	W	W
Coarse and fine aggregate ⁵	W	W	W	W	7,260	55,000	W	W
Agricultural ⁶	W	W	W	W	W	W	W	W
Chemical and metallurgical ⁷	--	--	--	--	W	W	--	--
Other miscellaneous use	--	--	31	213	--	--	1	7
Unspecified: ⁸								
Reported	2,900	20,800	2,170	15,700	2,490	18,000	685	4,950
Estimated	99	719	4,100	30,000	8,500	62,000	7,500	54,000
Total	6,830	45,900	13,400	97,600	26,500	196,000	11,400	81,300

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

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

²Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

³Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregate.

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

⁵Includes crusher run or fill or waste, graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.

⁶Includes agricultural limestone.

⁷Includes lime manufacture.

⁸Reported and estimated production without a breakdown by end use.

TABLE 5
KENTUCKY: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2005,
BY MAJOR USE CATEGORY^{1,2}

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products	4,940	\$28,100	\$5.70
Asphaltic concrete aggregates and road base materials	224	1,350	6.02
Fill	172	778	4.52
Unspecified: ³			
Reported	2,450	12,100	4.95
Estimated	2,700	12,600	4.68
Total or average	10,500	55,000	5.25

¹To avoid disclosing company proprietary data, no district tables were produced for 2005.

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

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