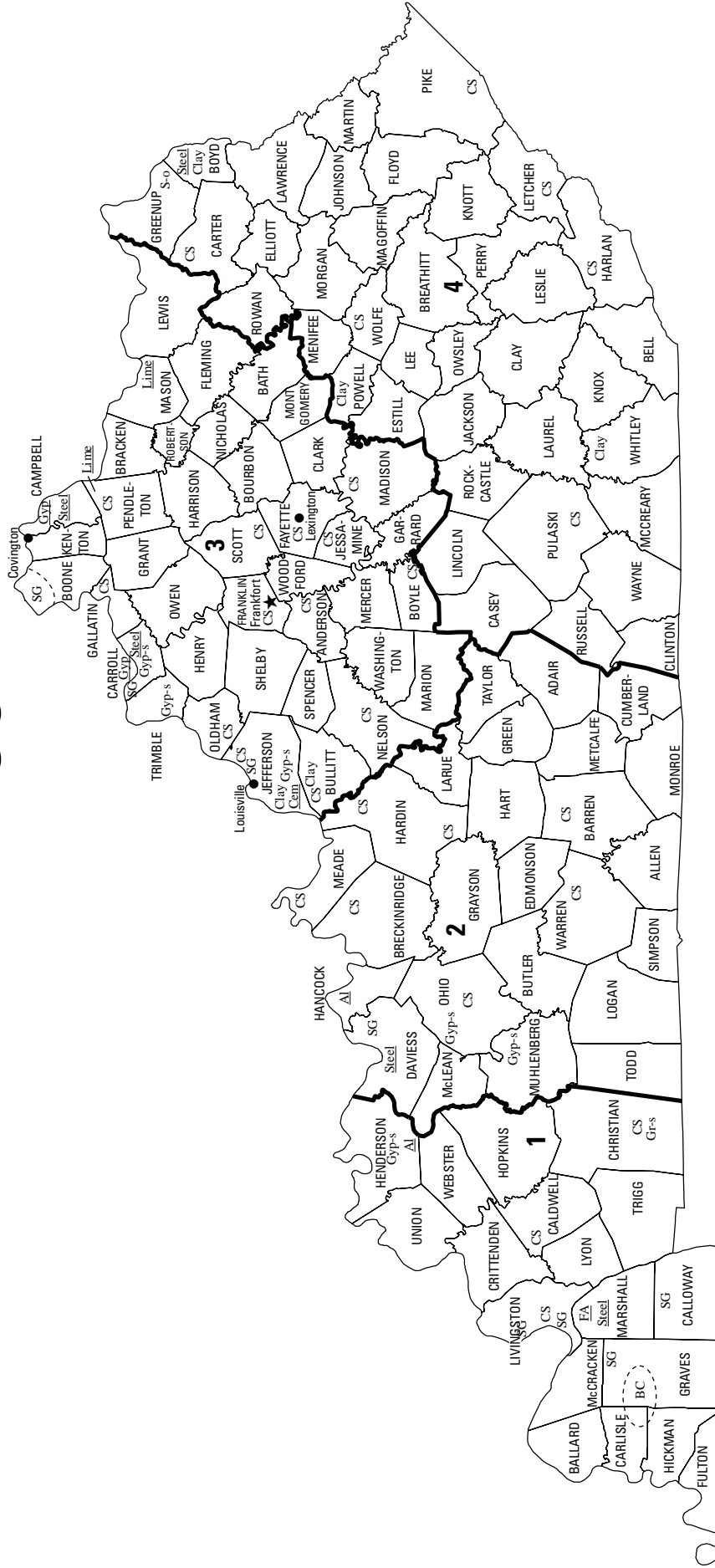




2006 Minerals Yearbook

KENTUCKY

KENTUCKY



LEGEND

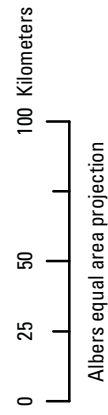
- County boundary
- ★ Capital
- City
- 1— Crushed stone/sand and gravel district boundary

MINERAL SYMBOLS

(Major producing areas)

- Al Aluminum plant
- BC Ball clay
- Cem Cement plant
- Clay Common clay
- CS Crushed stone
- FA Ferroalloys plant
- Gr-s Synthetic graphite plant

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



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 2006, Kentucky's nonfuel raw mineral production¹ was valued at \$806 million, based upon annual U.S. Geological Survey (USGS) data. This was a \$24 million, or 3.1%, increase from the State's total nonfuel mineral production value of 2005, and followed a \$91 million, or more than 13%, increase in the State's value from 2004 to 2005. Kentucky rose to 26th from 27th in rank among the 50 States in total nonfuel mineral production value, accounting for more than 1% 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 \$192 per capita.

Crushed stone continued to be Kentucky's leading nonfuel mineral commodity in 2006 and accounted for 54% 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 about 98% of the State's total nonfuel mineral production value. In 2006, Kentucky's increase in value was mostly the result of increases in the values of portland cement and lime of more than \$15 million each, the unit values of each showing modest increases. Increases also took place in the values of ball clay, common clays, and masonry cement. The largest decrease took place in crushed stone, down by \$11 million. Although having minimal effect on the State's total nonfuel mineral value, the value of gemstones was down by 39% in 2006 from that of 2005 (table 1).

In 2006, Kentucky continued to rank 4th in the quantities of ball clay produced, and the State produced significant quantities of crushed stone (11th in rank), portland cement, and construction sand and gravel (descending order of value). Kentucky decreased in rank to third from second in the production of lime and to eighth from seventh in that of common clays. Additionally, 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 2006 USGS mineral production data published in this chapter are those available as of March 2008. 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

Hastie Fluorspar Mining and Moodie Minerals Inc. continued fluorite exploration in the Western Kentucky Fluorspar District. Core drilling results from the Klondike Mine area in Livingston County showed significant evidence of fluorspar mineralization along the fault systems. The companies planned to continue core drilling in 2007 to evaluate the potential for opening a mine at the site (Greb and Anderson, 2007).

The KGS and the Department of Geological Sciences at the University of Kentucky continued to examine dikes in the Coefield Creek ultramafic intrusive complex in Crittenden County. Alkalic lamprophyre dikes were tentatively identified as alnoites (Heck and others, 2006).

Startups, Acquisitions and Upgrades

Rinker Materials Corporation, headquartered in West Palm Beach, FL, purchased four properties from Nally & Gibson Georgetown. The purchase consisted of three quarries and one concrete block plant in southeastern Kentucky along Pine Mountain (Greb and Anderson, 2007; Markley, 2007).

Alpha Natural Resources, Abingdon, VA, a supplier of coal to electric utility companies, began construction of the Gallatin Materials, LLC lime plant, located at the Sterling Materials Mine, in Verona, KY. Alpha had acquired a 77.5% interest in the Gallatin plant and planned to sell the produced lime to coal-burning utility companies as a scrubbing agent for removing sulfur dioxide from flue gases (Alpha Natural Resources, Inc., 2007).

Florida Tile Industries, Inc. was purchased by Panariagroup Industrie Ceramiche SPA, a publicly traded Italian Corporation, in February. In mid-September, a new state-of-the-art porcelain plant was commissioned at the Lawrenceburg plant site. The acquisition by Panariagroup represented a major investment in the U.S. ceramic tile market for the company (Florida Tile Industries, Inc., 2006).

Superior Graphite, Chicago, IL, a producer of graphite and carbon products at three plants in Hopkinsville, announced the expansion of its silicon carbide powder plant. The expansion of this advanced materials plant was intended to supply sufficient silicon carbide powder for the increased demand in the production of ceramic armor tiles (Lane Report, The, 2007).

Technology

The KGS completed a 2-year geochemical sampling program sponsored by the USGS National Geochemical Survey (NGS) through the collection of stream sediment samples

across various portions of Kentucky. This program served to supplement earlier geochemical sampling acquired under the National Uranium Resource Evaluation program that was conducted in the 1970s. Data from the NGS program are documented in the Web site (<http://tin.er.usgs.gov/geochem/doc/home.htm>) and could provide valuable geochemical exploration information for companies exploring for metals and nonmetals in the State.

The KGS has been an active participant in the STATEMAP program. STATEMAP is a component of the congressionally mandated National Cooperative Geologic Mapping Program (NCGMP), through which the USGS 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 2006, the KGS completed a set of digital 1:100,000-scale geologic maps for the State, and many have been prepared for public distribution. A new series of derivative maps, termed Land Use maps, also were prepared based on the digital geology information. Potential limestone resources in the State were shown on these derivative maps. The KGS continued to release these maps via the KGS GeoPortal, an internet map server. This Web site, gsmmap.uky.edu/website/KGSGeoPortal/KGSGeoPortal.asp, allows a user to download various types of geologic maps and data to create custom maps. Work also was continued on creating a minerals database and Geographic Information System that would be accessible via the internet and be a valuable means for public distribution of minerals information.

The University of Kentucky continued State funded research into carbon dioxide sequestration and its impact on underground limestone mining operations. Limited amounts of carbon dioxide were to be injected at a proposed carbon dioxide test site near the Duke Energy Power Plant in Boone County, in an effort to monitor the behavior and migration of the fluid. Monitoring wells were to be used to observe the subsurface fluid's behavior at the test site. Operators of an underground limestone mine, located approximately 16 kilometers to the south of the test site, had expressed concerns regarding the possibility of leakage or drainage of carbon dioxide into the underground mine. The depth to which carbon dioxide is injected into the ground at the powerplant to sequester the carbon dioxide generally exceeds that of any mine.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2004		2005		2006	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	978	4,510	1,060	4,370	1,000	5,140
Gemstones, natural	NA	22	NA	78	NA	48
Sand and gravel, construction	10,300	49,700	10,500	55,000	10,100	54,400
Stone, crushed	62,100 ³	384,000 ³	61,600 ^r	446,000 ^r	59,000	435,000
Combined values of cement, clays (ball), lime, stone [crushed dolomite (2004)]	XX	253,000	XX	277,000 ^r	XX	311,000
Total	XX	691,000	XX	782,000 ^r	XX	806,000

^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	2005			2006		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone ²	92 ^r	60,400 ^r	\$438,000 ^r	92	59,000	\$435,000
Dolomite	1	W	W	--	--	--
Granite	1	W	W	--	--	--
Total	XX	61,600 ^r	446,000 ^r	XX	59,000	435,000

^rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

-- Zero.

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 2006, BY USE¹

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Riprap and jetty stone	304	2,300
Filter stone	227	1,510
Other coarse aggregate	1,290	9,440
Total	1,820	13,200
Coarse aggregate, graded:		
Concrete aggregate, coarse	1,090	7,940
Bituminous aggregate, coarse	3,250	23,400
Bituminous surface-treatment aggregate	419	3,080
Railroad ballast	680	4,480
Other graded coarse aggregate	6,270	50,000
Total	11,700	88,800
Fine aggregate (-¾ inch):		
Stone sand, concrete	W	W
Stone sand, bituminous mix or seal	759	6,100
Screening, undesignated	211	1,400
Other fine aggregate	3,470	24,600
Total	4,440	32,100
Coarse and fine aggregates:		
Graded road base or subbase	3,620	23,700
Unpaved road surfacing	470	2,900
Crusher run or fill or waste	256	1,620
Other coarse and fine aggregates	5,280	37,800
Total	9,630	66,000
Other construction materials	132	1,000
Agriculture:		
Limestone	655	3,700
Other agriculture uses	14	75
Total	669	3,780
Chemical and metallurgical, lime manufacture		
	(2)	(2)
Unspecified:³		
Reported	12,500	95,600
Estimated	18,000	130,000
Total	30,600	230,000
Grand total	59,000	435,000

W Withheld to avoid disclosing company proprietary data; included with "Other fine 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 with "Unspecified: Reported."

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

TABLE 4
KENTUCKY: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2006, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	Districts 1 and 2 ²		Districts 3 and 4 ²	
	Quantity	Value	Quantity	Value
Construction:				
Coarse aggregate (+1½ inch) ³	644	4,630	1,180	8,620
Coarse aggregate, graded ⁴	5,170	38,400	6,540	50,500
Fine aggregate (-¾ inch) ⁵	1,580	11,500	2,860	20,600
Coarse and fine aggregate ⁶	2,670	17,700	6,960	48,300
Other construction materials	130	991	2	9
Agricultural ⁷	464	2,570	205	1,200
Chemical and metallurgical ⁸	--	--	W	W
Unspecified:⁹				
Reported	4,290	31,800	8,170	63,800
Estimated	5,500	41,000	13,000	94,000
Total	20,400	148,000	38,600	287,000

W Withheld to avoid disclosing company proprietary data; included with "Unspecified: Reported." -- Zero.

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

²Districts 1 and 2 and 3 and 4 are combined to avoid disclosing company proprietary data.

³Includes filter stone, riprap and jetty stone, and other coarse aggregate.

⁴Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregate.

⁵Includes screening (undesigned), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregate.

⁶Includes crusher run or fill or waste, graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.

⁷Includes agricultural limestone and other agricultural uses.

⁸Includes lime manufacture.

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

TABLE 5
KENTUCKY: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2006,
BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products	7,080	\$38,100	\$5.38
Asphaltic concrete aggregates and road base materials ²	272	1,520	5.58
Fill	181	851	4.70
Unspecified:³			
Reported	630	3,790	6.01
Estimated	1,940	10,200	5.24
Total or average	10,100	54,400	5.39

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

²Includes road and other stabilization (lime).

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

TABLE 6
 KENTUCKY: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2006, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products	W	W	W	W	W	W
Asphaltic concrete aggregates and road base materials ²	W	W	W	W	W	W
Fill	--	--	3	19	178	831
Other miscellaneous uses	1,270	5,240	129	746	5,760	32,800
Unspecified: ³						
Reported	--	--	--	--	630	3,790
Estimated	959	5,020	145	758	785	4,110
Total	2,230	10,300	277	1,520	7,350	41,500
	District 4					
	Quantity	Value				
Concrete aggregate and concrete products	W	W				
Asphaltic concrete aggregates and road base materials ²	W	W				
Fill	--	--				
Other miscellaneous uses	195	829				
Unspecified: ³						
Reported	--	--				
Estimated	49	259				
Total	245	1,090				

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

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

²Includes road and other stabilization (lime)

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