



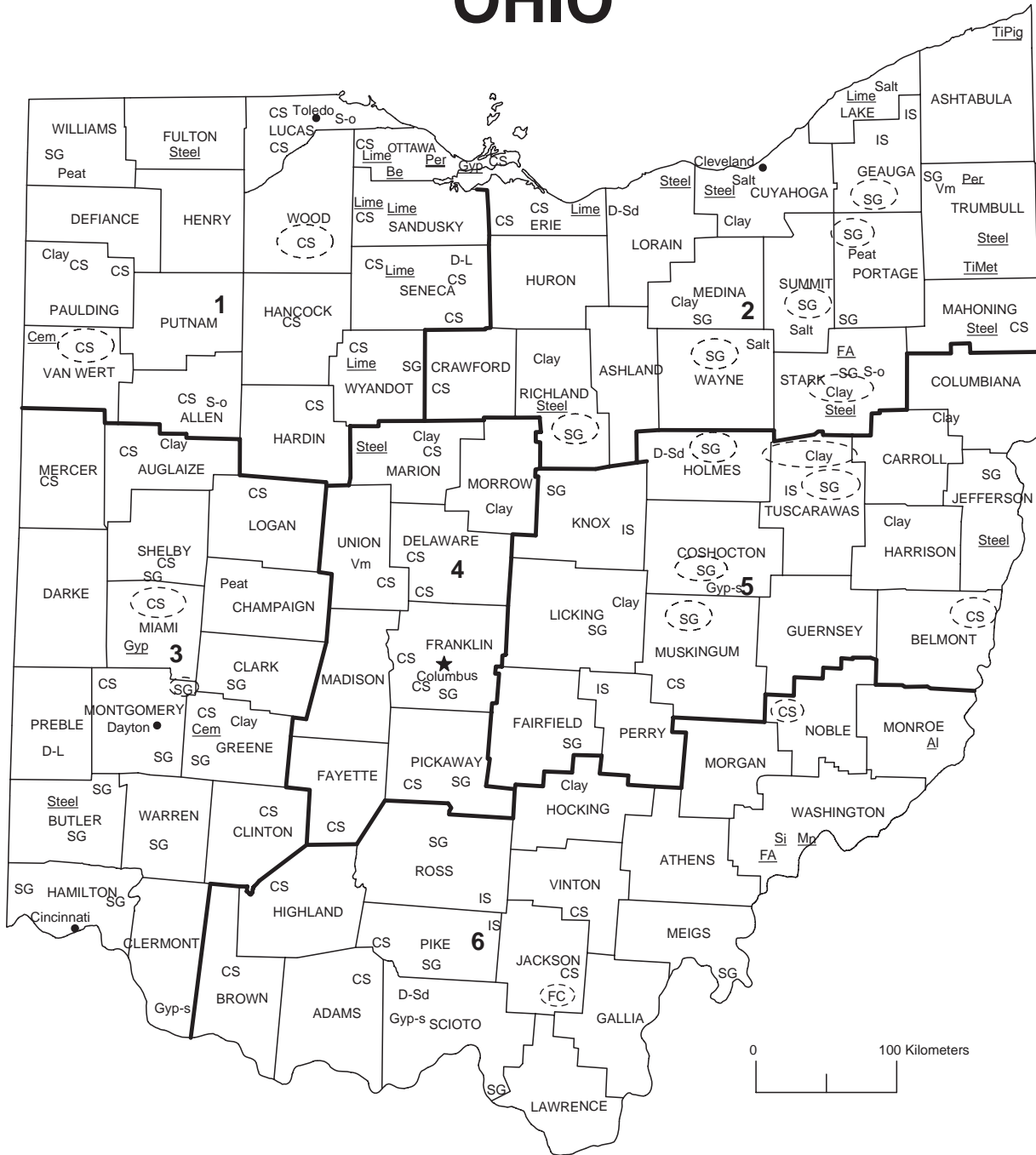
# 2005 Minerals Yearbook

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OHIO

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# OHIO



LEGEND		MINERAL SYMBOLS (Major Producing areas)			
	County boundary	Al	Aluminum plant	FC	Fire clay
	Capital	Be	Beryllium plant	Gyp	Gypsum
	City	Cem	Cement plant	Gyp-s	Synthetic gypsum
	Crushed stone/sand and gravel districts	Clay	Common clay	IS	Industrial sand
		CS	Crushed stone	Lime	Lime plant
		D-L	Dimension limestone	Mn	Manganese plant
		D-Sd	Dimension sandstone	Peat	Peat
		FA	Ferroalloys plant	Per	Perlite plant
				S-o	Sulfur (oil)
				Salt	Salt
				SG	Construction sand and gravel
				Si	Silicon metal plant
				Steel	Steel plant
				TiPig	Titanium pigment plant
				Vm	Vermiculite
					Concentration of mineral operations

Source: Ohio Division of Geological Survey/U.S. Geological Survey (2005)

# THE MINERAL INDUSTRY OF OHIO

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

In 2005, Ohio's nonfuel raw mineral production was valued<sup>1</sup> at \$1.21 billion, based upon annual U.S. Geological Survey (USGS) data. This was a nearly 7.1% increase from the State's total nonfuel mineral value for 2004, which was up 11.9% from that of 2003. The State was 17th in rank (virtually tied for 16th and down from 13th in 2004) among the 50 States in total nonfuel raw mineral production value and accounted for more than 2% of the U.S. total value.

Crushed stone by value remained Ohio's leading nonfuel mineral, followed by construction sand and gravel, salt, lime, cement (portland and masonry), and industrial sand and gravel (in descending order of value). Crushed stone and construction sand and gravel accounted for nearly 60% of the State's total nonfuel mineral value. A majority of the State's mineral commodities rose in value in 2005, led by the increases of crushed stone and construction sand and gravel. Although crushed stone production dropped slightly, down about 1.7%, its value rose by \$42 million, up 10.6%. Construction sand and gravel, with an increase in production of 1.7%, rose in value by \$25 million, up 9.5%. Industrial sand and gravel and portland cement followed with increases of about \$3.5 million each; lime value was up \$3 million; and the value of salt was up by about \$2 million. Relative to these increases, all decreases in commodity values (common clay, dimension stone, masonry cement, and peat) were small (table 1).

In 2005, Ohio continued to rank second among three fire clay-producing States, fourth in the quantities of salt produced, as well as fourth in that of lime, and fifth in the production of common clays. As the State increased to 9th from 10th in the production of industrial sand and gravel, it decreased to 7th from 6th in construction sand and gravel and to 8th from 6th in the production of crushed stone. Additionally, significant quantities of cement and dimension stone were produced in the State.

Ohio's mines only produced industrial minerals and coal; metals produced in the State, including aluminum, beryllium, ferroalloys, raw steel, and silicon, were processed from materials received from foreign and other domestic sources. In 2005, the State continued to be the Nation's second leading raw steel-manufacturing State with an estimated output of about 14.9 million metric tons (Mt), up 4.2% from 14.3 Mt that were produced in 2004, as reported by the American Iron and Steel Institute (American Iron and Steel Institute, 2006, p. 74). With a significant decrease in the production, Ohio decreased to 12th from 10th in the production of primary aluminum.

<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 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>.

The Ohio Department of Natural Resources, Division of Geological Survey<sup>2</sup> (ODGS), provided the following narrative information, based upon its own surveys, estimates, and data that it acquired from other State agencies. In 2005, industrial minerals were produced in 87 of Ohio's 88 counties. Based upon ODGS surveys and estimates, Ohio's total combined nonfuel mineral production during 2005 was 127.6 Mt, a 3.0% decrease from that of 2004; the total value of industrial minerals produced in Ohio during 2005, not including cement or gemstones, was \$900 million. The Ohio nonfuel mineral industry employed more than 5,300 people during 2005; wages for all employees at industrial mineral operations totaled nearly \$428 million.

## Commodity Review

### Industrial Minerals

**Common Clays.**—Clay and shale production in 2005 moderated somewhat from that of 2004. Belden Brick Co. was the largest producer of building brick in the State; the company's seven plants in Tuscarawas County had the capacity to produce 225 million bricks per year. Several other operators produced millions of additional bricks at plants located in the counties of Columbiana, Harrison, Licking, Marion, and Richland. Large quantities of Ohio clay and shale continued to be used in cement manufacture and lightweight-aggregate applications. Stone Creek Brick Co. discontinued operations late in 2004.

**Construction Sand and Gravel.**—Sand and gravel was sold or produced in 64 counties in 2005 by 210 companies at 292 active operations, the majority of which were small to medium in size and served local markets. The largest sand and gravel operation was Olen Corp.'s Columbus Plant, which produced 2.1 Mt of aggregate from glacial outwash and kame terraces in southern Franklin County. Three other operations located in Butler County and Stark County produced more than 1 Mt each during 2005, and 22 additional pits, located throughout the State, each produced more than 500,000 metric tons (t) of sand and gravel. Martin Marietta Aggregates, again, led the State overall producing nearly 8.1 Mt of sand and gravel from its 13 operations throughout the State; Shelly Materials, Inc. was the State's second largest producing company with a total of nearly 4.9 Mt of sand and gravel from its 12 operations (Ohio Division of Geological Survey, 2006a§<sup>3</sup>).

**Crushed Stone.**—Ohio's 112 active stone quarries produced 72.1 Mt of limestone and dolomite in 2005. The State's single most productive limestone quarry was the Delaware Quarry (in Delaware County), operated by National Lime and Stone Co.

<sup>2</sup>Mark E. Wolfe, a Senior Geologist with the Ohio Division of Geological Survey, authored the text of the State mineral industry information provided by that State agency.

<sup>3</sup>References that include a section mark (§) are included in the Internet References Cited section.

This quarry produced 4.4 Mt of aggregate from the Devonian-age Columbus Limestone and Silurian-age Salina Dolomite. National Lime and Stone also continued to lead the State in limestone and dolomite production with an overall production of more than 13 Mt from 10 separate plant operations. Hanson Aggregates Midwest, Inc. and Shelly Materials, Inc. were the second and third largest producing companies with production of 11.3 Mt and 10.6 Mt of stone, respectively. These two companies also had the next largest single quarry operations in the State. In 2005, from Shelly Materials' Columbus Limestone #331 nearly 4 Mt of stone was produced, and Hanson Aggregates' Sandusky Quarry (Erie County) produced 3.29 Mt of stone. The primary use for crushed and broken limestone and dolomite in the State was road construction and resurfacing; other major uses included various stone products for asphaltic concrete and portland cement concrete, commercial building, and for the production of lime (Ohio Division of Geological Survey, 2005§; 2006a§).

During 2005, East Fairfield Coal Co. began construction of a second underground limestone mine in Mahoning County.

**Dimension Stone.**—Based upon ODGS surveys and estimates, production of Ohio dimension sandstone, limestone, and dolomite increased more than 35% from that of 2004; sales of dimension sandstone rose 27% in 2005 from that of 2004 (Ohio Division of Geological Survey, 2005§; 2006a§). Demand remained strong for institutional and residential projects in Ohio and from outside of the State. Large stone supply companies in the State obtained rough stone from the State's quarries and then cut it to meet customer specifications.

**Gypsum.**—Ohio's lone remaining gypsum quarry, K West Group LLC's Port Clinton quarry in Ottawa County, flooded in 2004, and was permanently abandoned in 2005. Minor amounts of gypsum were sold in 2005 from existing stockpiles.

**Industrial Sand and Gravel.**—Ohio has an abundance of high-silica sandstones that can be used for glass manufacture and other industrial applications. During 2005, Best Sand Corp. produced 693,000 t of industrial sand from the Pennsylvanian-age Sharon conglomerate, located in Geauga County. Ogleby Norton Industrial Sands, Inc. produced more than 368,000 t of high-silica sand from operations in Knox County and Perry County. Production came from the Mississippian-age Black Hand Sandstone and Pennsylvanian-age Massillon Sandstone, respectively.

**Salt.**—Salt was produced by three companies at five operations in five Ohio counties during 2005. Reported known production of salt for the year was nearly 4.48 Mt. Two large underground mines (located mostly beneath Lake Erie), one each in Cuyahoga County and Lake County, produced rock salt at a record level with the company's sales for 2005 (including stocks) totaling about 4.0 Mt. These two mines, Cargill Inc.,

Cargill Salt Division, and Morton International, Inc., Morton Salt Division, were the major salt producers in Ohio during 2005. Three brining operations, one each in Licking, Summit, and Wayne Counties, sold a total of 8,800 t of salt in brine and about 703,000 t of evaporated salt (Ohio Division of Geological Survey, 2006a§).

## Government Programs

The ODGS annually prepares and publishes a report on Ohio's coal and industrial mineral industry. Included in the 2005 Report on Ohio Mineral Industries are certain detailed production, employment, and geologic information about each industrial mineral operation in the State. The 2005 report and the five previous years' reports may be accessed over the Internet at URL <http://www.dnr.state.oh.us/Home/ogcim/minstat/minstat1/tabid/7798/Default.aspx>. A Web-based Geographic Information System (GIS) version of the Ohio mineral industries map from the report allows a user to directly access a summary of industrial minerals information by permitted operation (Ohio Division of Geological Survey, 2006b§).

Among many publications produced in 2005, the ODGS released an updated version of Educational Leaflet 12, "Clay and Shale in Ohio." The leaflet describes the geologic origin, properties, uses, history, and production trends of clay and shale in Ohio. The leaflet can be accessed on the ODGS Web site (Wolfe and Blankenberker, 2005§), and free printed versions can be obtained from the Ohio DGS Geologic Records Center at 614-265-6576, or by writing to the Ohio Department of Natural Resources, Division of Geological Survey, 2045 Morse Road, Bldg. C-1, Columbus, OH 43229-6693.

## Reference Cited

American Iron and Steel Institute, 2006, Table 24—Raw steel production by States, in American Iron and Steel Institute—AISI 2005 ASR: Washington, DC, American Iron and Steel Institute, 140 p.

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

(Thousand metric tons and thousand dollars)

Mineral	2003		2004		2005	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	W	W	98	13,000 <sup>e</sup>	W	W
Portland	1,030	82,200	1,020	85,700 <sup>e</sup>	986	89,200 <sup>e</sup>
Clays:						
Common	1,440	7,430	1,360	7,480	1,310	6,880
Fire	W	W	42	W	55	W
Gemstones	NA	4	NA	4	NA	4
Lime	1,880	114,000	1,880	127,000	1,790	130,000
Sand and gravel:						
Construction	47,300	242,000	50,800	263,000	51,700	288,000
Industrial	1,120	32,100	1,180	34,200	1,230	37,900
Stone:						
Crushed	70,500	339,000	76,500 <sup>r</sup>	396,000 <sup>r</sup>	75,200	437,000
Dimension	30	5,090	38	5,100	28	4,880
Combined values of peat, salt, and values indicated by symbol W	XX	188,000	XX	197,000	XX	211,000
Total	XX	1,010,000	XX	1,130,000 <sup>r</sup>	XX	1,210,000

<sup>e</sup>Estimated. <sup>r</sup>Revised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined values" data. 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.

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

Kind	2004			2005		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone <sup>2</sup>	92 <sup>r</sup>	69,500 <sup>r</sup>	\$366,000 <sup>r</sup>	94	65,800	\$392,000
Dolomite	8	6,570	28,000	9	8,940	42,700
Sandstone	4	457 <sup>r</sup>	2,450 <sup>r</sup>	4	467	2,700
Total	XX	76,500 <sup>r</sup>	396,000 <sup>r</sup>	XX	75,200	437,000

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

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

<sup>2</sup>Includes "limestone-dolomite" reported with no distinction between the two.

TABLE 3  
OHIO: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2005, BY USE<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
<b>Construction:</b>		
Coarse aggregate (+1½ inch):		
Riprap and jetty stone	345	2,340
Filter stone	196	809
Other coarse aggregates	242	1,680
Total	783	4,820
Coarse aggregate, graded:		
Concrete aggregate, coarse	1,240	5,890
Bituminous aggregate, coarse	2,790	15,700
Bituminous surface-treatment aggregate	360	1,610
Railroad ballast	271	1,150
Other graded coarse aggregates	2,520	11,700
Total	7,180	36,000
Fine aggregate (-¾ inch):		
Stone sand, concrete	92	512
Stone sand, bituminous mix or seal	204	1,330
Screening, undesignated	W	W
Other fine aggregates	1,050	4,460
Total	1,350	6,300
Coarse and fine aggregates:		
Graded road base or subbase	12,500	78,700
Unpaved road surfacing	7,670	46,800
Crusher run or fill or waste	259	1,070
Other coarse and fine aggregates	1,920	11,100
Total	22,400	138,000
Other construction materials	301	1,610
<b>Agricultural:</b>		
Limestone	501	3,090
Other agricultural uses	124	722
Total	625	3,810
<b>Chemical and metallurgical:</b>		
Cement manufacture	(2)	(2)
Lime manufacture	(2)	(2)
Flux stone	(2)	(2)
Glass manufacture	(2)	(2)
Total	5,610	28,700
<b>Special:</b>		
Asphalt fillers or extenders	(2)	(2)
Whiting or whiting substitute	(2)	(2)
Other fillers or extenders	(2)	(2)
Total	482	3,050
Other miscellaneous uses and specified uses not listed	215	950
<b>Unspecified:<sup>3</sup></b>		
Reported	30,900	184,000
Estimated	5,300	30,000
Total	36,300	214,000
Grand total	75,200	437,000

W Withheld to avoid disclosing company proprietary data; included with "Other fine 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 in "Total."

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

TABLE 4  
OHIO: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2005, BY USE AND DISTRICT<sup>1</sup>

(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) <sup>2</sup>	376	1,710	141	1,180	140	1,100	W	W
Coarse aggregate, graded <sup>3</sup>	4,520	19,500	W	W	W	W	W	W
Fine aggregate (-¾ inch) <sup>4</sup>	700	2,210	W	W	W	W	18	118
Coarse and fine aggregate <sup>5</sup>	6,570	35,100	8,240	51,900	2,610	15,900	W	W
Other construction materials	132	793	--	--	146	703	--	--
Agricultural <sup>6</sup>	W	W	W	W	75	496	W	W
Chemical and metallurgical <sup>7</sup>	W	W	W	W	W	W	W	W
Special <sup>8</sup>	W	W	W	W	W	W	--	--
Other miscellaneous uses	180	792	--	--	35	153	--	--
Unspecified: <sup>9</sup>								
Reported	8,520	49,700	5,790	33,500	3,460	22,700	8,260	48,600
Estimated	2,000	12,000	326	1,900	846	4,800	--	--
Total	26,700	138,000	16,700	103,000	9,260	57,000	13,700	85,100
	District 5		District 6					
	Quantity	Value	Quantity	Value				
Construction:								
Coarse aggregate (+1½ inch) <sup>2</sup>	W	W	W	W				
Coarse aggregate, graded <sup>3</sup>	--	--	W	W				
Fine aggregate (-¾ inch) <sup>4</sup>	--	--	W	W				
Coarse and fine aggregate <sup>5</sup>	W	W	W	W				
Other construction materials	--	--	23	113				
Agricultural <sup>6</sup>	W	W	151	1,090				
Chemical and metallurgical <sup>7</sup>	--	--	--	--				
Special <sup>8</sup>	--	--	--	--				
Other miscellaneous uses	1	5	--	--				
Unspecified: <sup>9</sup>								
Reported	2,030	12,200	2,890	17,300				
Estimated	743	4,300	1,400	7,900				
Total	3,210	19,900	5,630	35,100				

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, and other coarse and fine aggregates.

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

<sup>7</sup>Includes cement manufacture, flux stone, lime manufacture, and glass manufacture.

<sup>8</sup>Includes asphalt fillers or extenders, whiting or whiting substitute, and other fillers and extenders.

<sup>9</sup>Reported and estimated production without a breakdown by end use.

TABLE 5  
OHIO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2005,  
BY MAJOR USE CATEGORY<sup>1</sup>

Use	Quantity		
	(thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	7,230	\$37,900	\$5.24
Plaster and gunitite sands	72	896	12.44
Concrete products (blocks, bricks, pipe, decorative, etc.)	115	707	6.15
Asphaltic concrete aggregates and other bituminous mixtures	3,400	17,600	5.16
Road base and coverings	2,540	15,000	5.92
Road stabilization (cement)	80	510	6.38
Fill	5,160	25,700	4.99
Snow and ice control	103	522	5.07
Roofing granules	27	307	11.37
Filtration	64	446	6.97
Other miscellaneous uses	578	4,610	7.97
Unspecified: <sup>2</sup>			
Reported	21,000	123,000	5.83
Estimated	11,300	61,400	5.44
Total or average	51,700	288,000	5.58

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

TABLE 6  
OHIO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2005,  
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)	400	2,330	2,110	11,100	2,710	14,400
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	W	W	W	W	55	344
Asphaltic concrete aggregates and other bituminous mixtures	427	1,920	860	5,120	1,100	5,640
Road base and coverings <sup>3</sup>	219	1,040	833	4,800	671	4,590
Fill	194	684	1,210	7,540	3,100	14,100
Snow and ice control	--	--	14	86	W	W
Other miscellaneous uses <sup>4</sup>	115	833	160	1,440	195	1,990
Unspecified: <sup>5</sup>						
Reported	--	--	3,850	23,100	7,390	44,600
Estimated	60	300	3,500	18,900	2,600	14,200
Total	1,420	7,150	12,500	72,200	17,800	99,900
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates (including concrete sand)	402	2,360	677	3,080	927	4,540
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	W	W	--	--	W	W
Asphaltic concrete aggregates and other bituminous mixtures	W	W	837	3,840	59	312
Road base and coverings <sup>3</sup>	W	W	566	3,080	45	286
Fill	194	1,360	317	1,460	142	579
Snow and ice control	W	W	34	140	15	84
Other miscellaneous uses <sup>4</sup>	552	3,750	194	1,010	21	161
Unspecified: <sup>5</sup>						
Reported	1,030	5,780	3,770	20,800	4,980	28,300
Estimated	3,200	17,100	1,900	10,100	100	700
Total	5,340	30,300	8,270	43,500	6,330	35,000

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 gunitite sands.

<sup>3</sup>Includes road and other stabilization (cement).

<sup>4</sup>Includes filtration and roofing granules.

<sup>5</sup>Reported and estimated production without a breakdown by end use.