



2006 Minerals Yearbook

PENNSYLVANIA

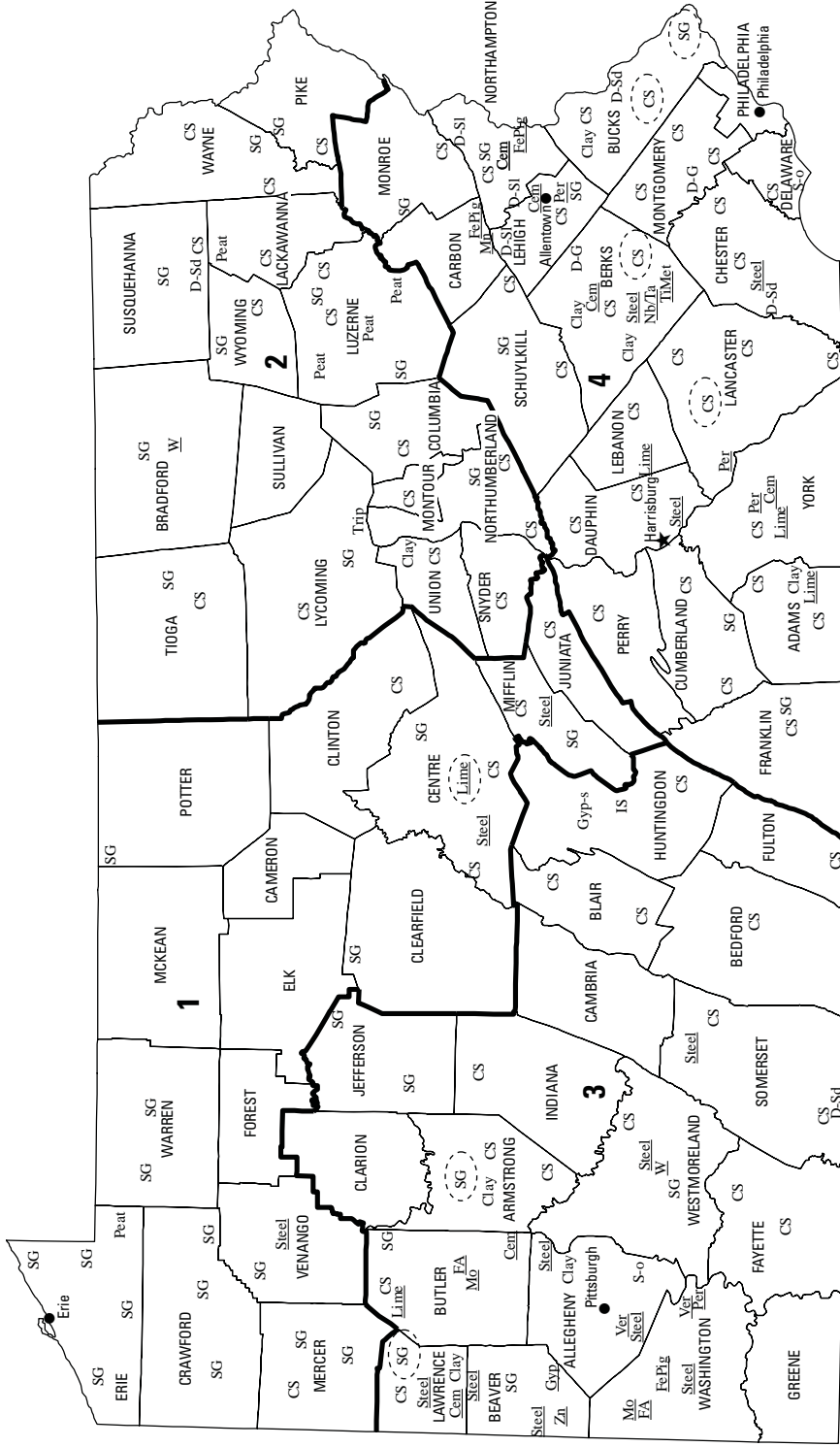
PENNSYLVANIA

LEGEND

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

MINERAL SYMBOLS (Major producing areas)

- Cem Cement plant
- Clay Common clay
- CS Crushed stone
- D-G Dimension granite
- D-Sd Dimension sandstone
- D-Sl Dimension slate
- FePig Iron oxide pigments plant
- FA Ferroalloys plant
- Gyp Gypsum plant
- Gyp-s Synthetic gypsum
- IS Industrial sand
- Lime Lime plant
- Mo Molybdenum plant
- Nb/Ta Niobium and tantalum plant
- Peat Peat
- Per Perlite plant
- S-o Sulfur (oil)
- SG Construction sand and gravel
- Steel Steel plant
- TiMet Titanium metal plant
- Trip Tripoli
- W Tungsten plant
- Ver Vermiculite plant
- Zn Zinc plant
- (dashed circle) Concentration of mineral operations



Albers equal area projection

Source: Pennsylvania Bureau of Topographic and Geological Survey/U.S. Geological Survey (2006).

THE MINERAL INDUSTRY OF PENNSYLVANIA

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

In 2006, Pennsylvania's nonfuel raw mineral production¹ was valued at \$1.71 billion, based upon annual U.S. Geological Survey (USGS) data. This was a \$150 million, or 9.6%, increase from the \$1.56 billion total value for 2005, which also had increased by \$150 million, or up by 10.6%, from 2004 to 2005. Pennsylvania continued to rank 12th in the Nation in total nonfuel mineral production value and accounted for more than 2.5% of the U.S. total value. [The actual totals for 2005–06 are higher than those shown in table 1; tripoli data have been withheld (company proprietary data).]

In 2006, Pennsylvania continued to be among the Nation's leading States in the production of crushed stone and cement (portland and masonry) (descending order of value). These two mineral commodities and construction sand and gravel, the next highest by value, accounted for about 91.5% of Pennsylvania's total nonfuel raw mineral production value. Lime accounted for about 6.7% of the same total value (table 1), followed by industrial sand and gravel and dimension stone, with slightly less than 1% each.

Nearly all of the State's nonfuel mineral commodities increased in value in 2006, led especially by the increases in crushed stone and portland cement. Although production did increase for a majority of the mineral commodities, much of the increase in 2005 and 2006 resulted from higher average unit prices for most of the commodities.

The production value of crushed stone increased by \$75 million, or nearly 11%, partly resulting from a nearly 4% increase in production. Although portland cement production decreased by 4%, its value increased by \$45 million, or up by 8%. Construction sand and gravel followed with a 14% value increase of \$15 million and lime was up by almost \$12 million. Other mineral commodities with increases in value of \$1 million or more included masonry cement, common clays, and dimension stone, up by \$2.5 million, slightly more than \$2 million, and \$1 million, respectively. The average unit values of all of these nonfuel mineral commodities increased in 2006, although that of dimension stone rose only slightly. The only decreases in total commodity value (small relative to those with increases) took place in peat and tripoli (table 1).

In 2006, Pennsylvania continued to rank third in the Nation in the quantity of crushed stone and in the quantity of portland cement produced. The State also remained fourth of four States that produced tripoli, sixth in masonry cement, and seventh in the production of lime. Additionally, substantial quantities of construction sand and gravel, industrial sand and gravel,

dimension stone, and common clays were produced in the State. With regard to raw minerals and mineral materials, Pennsylvania is exclusively an industrial mineral- and coal-producing State, producing no primary metals from ores mined within the State; metals that were produced in the State, principally steel, as well as, niobium, tantalum, titanium, and zinc, were processed from materials acquired from foreign and other domestic sources. Pennsylvania rose in rank to third from fourth in the Nation in the production of raw steel in 2006, with an output of 6.18 million metric tons (Mt), up from the 5.9 Mt produced in 2005 (American Iron and Steel Institute, 2007, p. 74).

The Pennsylvania Bureau of Topographic and Geologic Survey, the Pennsylvania Geological Survey² (PGS), provided the following narrative information.

Government Programs and Activities

The PGS 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. Maps were produced at a scale of 1:24,000.

In 2006, PGS map projects included digital maps of bedrock geology, which were produced covering the following areas of Pennsylvania: the Chester Valley and Piedmont portion of the Germantown, Malvern, Norristown, and Valley Forge quadrangles, Chester, Delaware, Montgomery, and Philadelphia Counties; the Honey Brook quadrangle, Chester and Lancaster Counties; the Oxford and Pennsylvania portion of the Bay View quadrangles, Chester and Lancaster Counties; and the Parkesburg quadrangle, Chester and Lancaster Counties.

Digital maps of surficial geology were produced covering the following areas: the Barbours 7.5-minute quadrangle, Lycoming and Sullivan Counties; the Bodines 7.5-minute quadrangle, Lycoming County; the Center Moreland 7.5-minute quadrangle, Wyoming and Luzerne Counties; the Factoryville 7.5-minute quadrangle, Wyoming and Lackawanna Counties; the Great Bend 7.5-minute quadrangle, Susquehanna County; the Hawley 7.5-minute quadrangle, Wayne County; the Hop Bottom 7.5-minute quadrangle, Susquehanna and Wyoming Counties; the Kingston 7.5-minute quadrangle, Luzerne County; the Lake Ariel 7.5-minute quadrangle, Wayne and Lackawanna Counties; the Lakeville 7.5-minute quadrangle, Wayne County;

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>.

²John H. Barnes, P. G., Supervisory Geologist with the Pennsylvania Geological Survey, authored the text of the State mineral industry information provided by that State agency.

the Olyphant 7.5-minute quadrangle, Lackawanna County; the Pittston 7.5-minute quadrangle, Luzerne and Lackawanna Counties; the Ransom 7.5-minute quadrangle, Lackawanna, Wyoming, and Luzerne Counties; the Scranton 7.5-minute quadrangle, Lackawanna County; the Springville 7.5-minute quadrangle, Susquehanna and Wyoming Counties, the Starrucca 7.5-minute quadrangle, Wayne and Susquehanna Counties; the Susquehanna 7.5-minute quadrangle, Susquehanna County; and the Tunkhannock 7.5-minute quadrangle, Wyoming County.

More information on the geology, hydrology, mineral resources, and mining history of Pennsylvania, as well as a

variety of PGS publications is available from the Pennsylvania Geological Survey. Much of this information, PGS contact information, and several educational series publications regarding both nonfuel and fuel minerals are available over the Internet at <http://www.dcnr.state.pa.us/topogeo/>.

Reference Cited

American Iron and Steel Institute, 2007, Table 24—Raw steel production by States, *in* American Iron and Steel Institute, AISI 2006 ASR: Washington, DC, American Iron and Steel Institute, 126 p.

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

(Thousand metric tons and thousand dollars)

Mineral	2004		2005		2006	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	W	W	399	49,700 ^e	384	52,200 ^e
Portland	6,230	473,000 ^e	6,290	554,000 ^e	6,020	599,000 ^e
Clays, common	822	3,270	705	3,460	742	5,630
Gemstones, natural	NA	1	NA	1	NA	1
Lime	1,220	100,000	1,100	104,000	1,160	115,000
Peat	11	307	7	210	1	52
Sand and gravel:						
Construction	20,000	127,000	17,000	111,000	18,400	126,000
Industrial	W	W	711	15,400	696	15,500
Stone:						
Crushed	113,000	639,000	107,000 ^r	713,000 ^r	111,000	788,000
Dimension	33	10,100	35	11,800	38	12,800
Combined values of tripoli and values indicated by the symbol W	XX	55,800	XX	(3)	XX	(3)
Total	XX	1,410,000	XX	1,560,000 ^r	XX	1,710,000

^eEstimated. ^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined values" data. XX Not applicable.

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

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

³Value withheld to avoid disclosing company proprietary data.

TABLE 2
PENNSYLVANIA: 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	109 ^r	61,300 ^r	\$413,000 ^r	104	64,600	\$460,000
Dolomite	13	12,400	79,700	11	11,800	82,200
Marble	1	W	W	1	W	W
Granite	7	6,450	40,700	6	4,280	30,600
Traprock	7 ^r	4,700 ^r	33,000 ^r	7	6,480	46,800
Sandstone and quartzite	41 ^r	10,800 ^r	73,500 ^r	42	12,700	91,600
Slate	11 ^r	W	W	11	W	W
Miscellaneous stone	18 ^r	9,530 ^r	62,400 ^r	17	9,320	65,300
Total	XX	107,000 ^r	713,000 ^r	XX	111,000	788,000

^rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." 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
PENNSYLVANIA: 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):		
Macadam	580	4,790
Riprap and jetty stone	512	4,390
Filter stone	417	3,180
Other coarse aggregate	3,370	27,300
Total	4,880	39,700
Coarse aggregate, graded:		
Concrete aggregate, coarse	2,520	18,800
Bituminous aggregate, coarse	5,310	37,900
Bituminous surface-treatment aggregate	2,820	20,300
Railroad ballast	282	2,600
Other graded coarse aggregate	8,840	61,700
Total	19,800	141,000
Fine aggregate (¾ inch):		
Stone sand, concrete	W	W
Stone sand, bituminous mix or seal	2,520	18,400
Screening, undesignated	634	4,700
Other fine aggregate	5,610	44,200
Total	8,760	67,200
Coarse and fine aggregates:		
Graded road base or subbase	5,690	35,200
Unpaved road surfacing	342	2,670
Crusher run or fill or waste	1,190	6,220
Other coarse and fine aggregates	9,460	56,600
Total	16,700	101,000
Other construction materials	296	3,130
Agricultural:		
Limestone	573	6,400
Poultry grit and mineral food	(2)	(2)
Other agricultural uses	88	483
Chemical and metallurgical:		
Cement manufacture	5,180	35,800
Lime manufacture	1,190	7,360
Flux stone	227	1,680
Sulfur oxide removal	483	3,440
Total	7,090	48,300
Special:		
Mine dusting or acid water treatment	(2)	(2)
Asphalt fillers or extenders	(2)	(2)
Whiting or whiting substitute	(2)	(2)
Other fillers or extenders	407	4,680
Other miscellaneous uses and specified uses not listed	491	3,680
Unspecified:³		
Reported	26,200	187,000
Estimated	25,000	180,000
Total	51,400	368,000
Grand total	111,000	788,000

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 in "Grand total."

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

TABLE 4
PENNSYLVANIA: CRUSHED STONE SOLD OR USED BY PRODUCERS 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
Construction:						
Coarse aggregate (+1½ inch) ²	77	603	452	3,660	916	7,730
Coarse aggregate, graded ³	391	2,570	1,330	9,540	4,440	33,300
Fine aggregate (¾ inch) ⁴	147	970	870	5,990	1,630	12,000
Coarse and fine aggregates ⁵	352	2,140	1,760	10,700	3,400	21,100
Other construction materials	--	--	--	--	26	295
Agricultural ⁶	W	W	W	W	W	W
Chemical and metallurgical ⁷	W	W	W	W	2,160	17,100
Special ⁸	W	W	W	W	W	W
Other miscellaneous uses and specified uses not listed	68	509	1	10	422	3,160
Unspecified:⁹						
Reported	1,490	10,500	3,650	26,100	5,000	35,500
Estimated	3,000	22,000	3,700	27,000	3,300	24,000
Total	6,990	48,700	11,900	83,300	21,700	159,000
District 4						
	Quantity	Value				
Construction:						
Coarse aggregate (+1½ inch) ²	3,440	27,700				
Coarse aggregate, graded ³	13,600	96,000				
Fine aggregate (¾ inch) ⁴	6,110	48,300				
Coarse and fine aggregates ⁵	11,200	66,700				
Other construction materials	270	2,840				
Agricultural ⁶	W	W				
Chemical and metallurgical ⁷	3,460	21,900				
Special ⁸	W	W				
Other miscellaneous uses and specified uses not listed	--	--				
Unspecified:⁹						
Reported	16,100	115,000				
Estimated	15,000	110,000				
Total	70,200	497,000				

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 aggregates.

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

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

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

⁶Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

⁷Includes cement and lime manufacture, flux stone, and sulfur oxide removal.

⁸Includes mine dusting or acid water treatment, asphalt fillers or extenders, whitening or whitening substitute, and other fillers or extenders.

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

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

Use	Quantity	Value	Unit
	(thousand metric tons)	(thousands)	value
Concrete aggregate (including concrete sand)	2,340	\$19,900	\$8.52
Plaster and gunitite sands	32	369	11.53
Concrete products (blocks, bricks, pipe, decorative, etc.)	34	383	11.26
Asphaltic concrete aggregates and other bituminous mixtures	1,120	8,540	7.63
Road base and coverings	1,330	9,180	6.90
Fill	2,450	12,000	4.92
Snow and ice control	160	841	5.26
Filtration	45	540	12.00
Other miscellaneous uses ²	408	3,910	9.57
Unspecified: ³			
Reported	2,430	15,600	6.42
Estimated	8,100	54,900	6.78
Total or average	18,400	126,000	6.84

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

²Includes railroad ballast.

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

TABLE 6
PENNSYLVANIA: 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 aggregates and concrete products ²	695	5,960	W	W	W	W
Asphaltic concrete aggregates and other bituminous mixtures	612	5,290	317	2,040	W	W
Road base and coverings	660	4,590	W	W	W	W
Fill	51	200	184	894	10	38
Snow and ice control	94	510	W	W	W	W
Other miscellaneous uses ³	161	1,500	849	6,630	882	5,980
Unspecified: ⁴						
Reported	41	354	436	3,130	1,160	8,340
Estimated	2,390	16,200	1,390	9,430	3,570	24,200
Total	4,710	34,600	3,180	22,100	5,630	38,600
			District 4		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products ²	583	5,780	1	5		
Asphaltic concrete aggregates and other bituminous mixtures	W	W	2	12		
Road base and coverings	275	2,090	8	72		
Fill	2,180	10,800	22	131		
Snow and ice control	W	W	4	24		
Other miscellaneous uses ³	322	3,190	--	--		
Unspecified: ⁴						
Reported	386	2,990	401	774		
Estimated	750	5,080	--	--		
Total	4,500	29,900	438	1,020		

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 plaster and gunitite sands.

³Includes filtration and railroad ballast.

⁴Reported and estimated production without a breakdown by end use.