



2009 Minerals Yearbook

PENNSYLVANIA

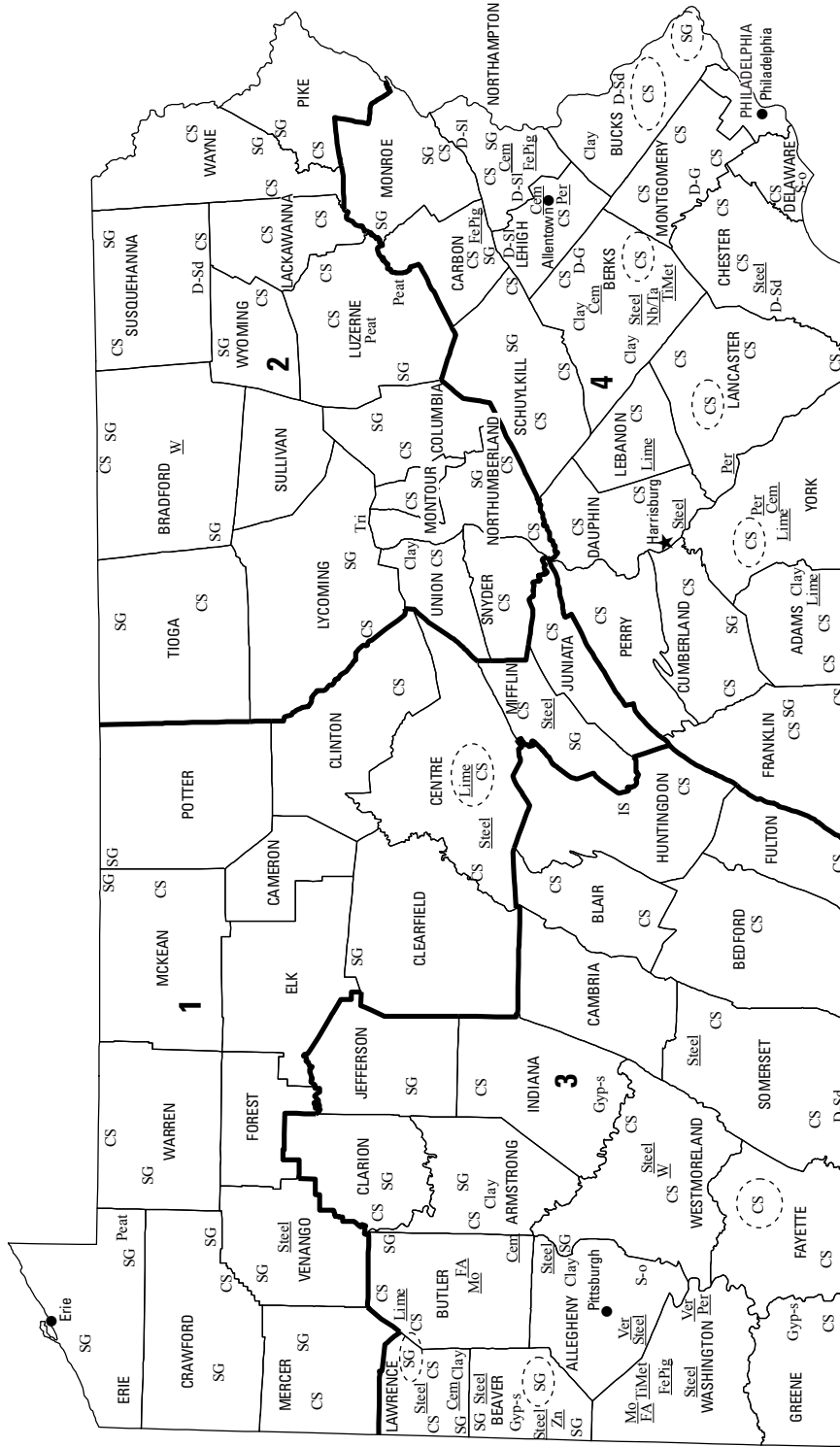
PENNSYLVANIA

LEGEND

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

MINERAL SYMBOLS (Principal 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-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
- Tri Tripoli
- W Tungsten plant
- Ver Vermiculite plant
- Zn Zinc plant
- Concentration of mineral operations



Source: Pennsylvania Bureau of Topographic and Geological Survey/U.S. Geological Survey (2009).

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 2009, Pennsylvania's nonfuel raw mineral production¹ was valued at \$1.62 billion, based upon annual U.S. Geological Survey (USGS) data. This was a \$350 million, or an almost 18%, decrease from the total production value of \$1.97 billion in 2008, which had increased by \$110 million, or 5.9%, from the total production value of \$1.86 billion in 2007. Pennsylvania rose in rank to 12th from 13th in the Nation in total nonfuel mineral production value and accounted for almost 2.8% of the U.S. total production value. This is the State's highest rank since 2002, when it ranked 9th and accounted for 3.4% of the U.S. total production value. (The actual totals for 2007–09 may be higher than those shown in table 1; tripoli data have been withheld to avoid disclosing company proprietary data.)

The State's leading nonfuel mineral commodities produced in 2009, by order of descending value, were crushed stone, portland cement, lime, construction sand and gravel, and masonry cement. These five commodities made up 98% of Pennsylvania's total nonfuel mineral production value. Pennsylvania continues to be among the Nation's leading producers of crushed stone and portland and masonry cement. These three mineral commodities account for 83% of the State's total nonfuel mineral industry value.

The two largest decreases in mineral production value in Pennsylvania in 2009 took place with crushed stone and portland cement, accounting for 91% of the total \$350 million decrease. Crushed stone decreased from 101 million metric tons (Mt) produced in 2008, valued at \$1.14 billion, to 83 Mt in 2009, valued at \$975 million. Portland cement decreased from 5.15 Mt in 2008, valued at \$510 million, to 3.74 Mt, valued at \$356 million.

Construction sand and gravel and masonry cement also decreased in production and production value, down 2.2 Mt and 0.78 Mt, and \$18 million and \$10.3 million, respectively. These four mineral commodities account for 99% of the State's total decrease in total production value. Other significant decreases took place with dimension stone and industrial sand and gravel.

Pennsylvania continued to rank second in the Nation in the quantity of crushed stone produced and fourth of four tripoli-producing States. The State also remained seventh in the production of lime. The State rose in rank from 7th to 5th in the production of masonry cement, from 10th to 8th in peat sales, from 11th to 10th in common clay production, and from 12th to 10th in dimension stone production. Pennsylvania dropped from

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 2009 USGS mineral production data published in this chapter are those available as of September 2011. 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>.

3d to 4th in portland cement production and from 19th to 20th in construction sand and gravel production.

Producing exclusively industrial minerals and coal, Pennsylvania did not produce any primary metals from ores mined in the State; the last metal-mining operation in the State closed more than 30 years ago. Metals that were produced in the State in 2009, principally steel, as well as ferroalloys, molybdenum, niobium, tantalum, titanium, tungsten, and zinc, were processed from materials acquired from other domestic and foreign sources. Additionally, Pennsylvania produced significant quantities of cadmium metal and finished iron oxide pigments. The State continued to rank first of three producing States for cadmium metal and fourth of eight producing States for finished iron oxide pigments. Metals operations were concentrated primarily in the industrial southwestern and eastern portions of the State, in the vicinities of Pittsburgh and Allentown, respectively.

The Pennsylvania Bureau of Topographic and Geologic Survey,² also known as the Pennsylvania Geological Survey (PGS), within the Pennsylvania Department of Conservation and Natural Resources, provided the following narrative information.

Government Programs and Activities

The PGS continued to conduct geologic investigations, surveys, and research of the geology, mineral resources, and topography of the State. The PGS continued to be 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.

Sixteen new publications were produced in 2009, including 13 bedrock geologic maps and 3 surficial geologic maps that were funded under the STATEMAP program.

Digital maps of bedrock geology were produced under the STATEMAP program covering the following areas of Pennsylvania: the McVeytown 7.5-minute quadrangle, Juniata and Mifflin Counties; the State College 7.5-minute quadrangle, Centre County; the Mansfield 7.5-minute quadrangle, Tioga County; the Kirkwood 7.5-minute

²Leonard J. Lentz, P.G., Geologic Scientist with the Pennsylvania Geological Survey, authored the text of the State mineral industry information provided by that State agency.

quadrangle and the Pennsylvania portion of the Rising Sun 7.5-minute quadrangle, southeast Lancaster and southwest Chester Counties, respectively; the northern portions of the Wakefield and Holtwood 7.5-minute quadrangles, Lancaster and York Counties, respectively; the Pennsylvania portion of the Delta and Conowingo Dam 7.5-minute quadrangles, York and Lancaster Counties; respectively; and, portions of the Phoenixville, Pottstown, Elverson, and Morgantown 7.5-minute quadrangles, mostly in Chester County, along with parts of Montgomery, Berks, and Lancaster Counties.

Digital maps of surficial geology were produced under the STATEMAP program covering the following areas: the Jackson Summit and Mansfield 7.5-minute quadrangles, Tioga County; and, the Sugar Lake 7.5-minute quadrangle, Crawford and Venango Counties.

The PGS continued its program of making older publications available on the Internet in a digital format that can be read or downloaded at no charge. Such publications made available in 2009 included: two water resource reports by Hollowell and Koester (1975) and Carswell and Lloyd (1979); a map compiled by Berg, Edmunds, Geyer, and others (1980); and, a general geologic report by Leverett (1934).

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

variety of PGS publications, is available from the PGS. Much of this information, PGS contact information, and several educational series publications regarding both nonfuel and fuel minerals are available on the Internet at <http://www.dcnr.state.pa.us/topogeo/index.aspx>. Complete information on obtaining all Pennsylvania Geological Survey publications is with the PGS online listing of publications <http://www.dcnr.state.pa.us/topogeo/pub/lop.pdf>.

References Cited

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- Carswell, L.D., and Lloyd, O.B., Jr., 1979, Geology and groundwater resources of Monroe County, Pennsylvania: Middletown, PA, Pennsylvania Geological Survey Water Resource Report 47, 71 p. (Accessed February 16, 2012, at http://www.dcnr.state.pa.us/topogeo/pub/water/pdfs/w047_text.pdf.)
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- Leverett, Frank, 1934, Glacial deposits outside the Wisconsin terminal moraine in Pennsylvania: Middletown, PA, Pennsylvania Geological Survey Bulletin G7, 131 p. (Accessed February 16, 2012, at http://www.dcnr.state.pa.us/topogeo/pub/generalgeology/G7/g07_text.pdf.)

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

(Thousand metric tons and thousand dollars)

Mineral	2007		2008		2009	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	304	40,500 ^e	254	34,000 ^e	176	23,700 ^e
Portland	5,660	568,000 ^e	5,150	510,000 ^e	3,740	356,000 ^e
Clays, common	683	4,890	640	4,840	451	3,040
Gemstones, natural	NA	1	NA	1	NA	1
Lime	1,100	112,000	1,130	126,000	985	126,000
Peat	2	79	2	62	3	90
Sand and gravel:						
Construction	18,300	143,000	16,100 ^r	132,000 ^r	13,900	114,000
Industrial	685	15,800	677	16,300	618	15,600
Stone:						
Crushed	111,000	960,000	101,000 ^r	1,140,000	83,000	975,000
Dimension	59	16,200	42	11,100	39	9,670
Tripoli	W	W	W	W	W	W
Total	XX	1,860,000	XX	1,970,000	XX	1,620,000

^eEstimated. ^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; excluded from "Total." 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.

TABLE 2
PENNSYLVANIA: CRUSHED STONE SOLD OR USED, BY TYPE¹

Type	2008			2009		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone ²	121 ^r	57,700 ^r	\$574,000 ^r	111	46,200	\$479,000
Dolomite	21	12,000	113,000	20	10,200	98,800
Granite	8	4,160	40,100	6	2,780	28,700
Traprock	9	6,350	215,000	9	5,190	185,000
Sandstone and quartzite	62	11,600	109,000	64	11,300	113,000
Slate	27 ^r	1,530 ^r	16,300 ^r	18	888	10,000
Miscellaneous stone	30 ^r	7,720	69,300	32	6,460	59,900
Total	XX	101,000 ^r	1,140,000	XX	83,000	975,000

^rRevised. 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 2009, BY USE¹

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Macadam	W	W
Riprap and jetty stone	804	9,070
Filter stone	313	2,850
Other coarse aggregate	792	7,130
Coarse aggregate, graded:		
Concrete aggregate, coarse	2,270	22,800
Bituminous aggregate, coarse	2,610	26,600
Bituminous surface-treatment aggregate	987	11,400
Railroad ballast	812	7,170
Other graded coarse aggregate	4,100	34,300
Fine aggregate (-¾ inch):		
Stone sand, concrete	79	665
Stone sand, bituminous mix or seal	1,610	15,900
Screening, undesignated	599	5,530
Other fine aggregate	2,530	24,900
Coarse and fine aggregates:		
Graded road base or subbase	3,650	30,200
Unpaved road surfacing	868	8,920
Terrazzo and exposed aggregate	W	W
Crusher run or fill or waste	765	6,610
Roofing granules	W	W
Other coarse and fine aggregates	5,500	40,900
Other construction materials	1,020	9,100
Agricultural:		
Limestone	664	8,460
Poultry grit and mineral food	W	W
Other agricultural uses	11	848
Chemical and metallurgical:		
Cement manufacture	1,870	24,900
Lime manufacture	W	W
Flux stone	363	2,290
Chemical stone	W	W
Sulfur oxide removal	349	4,930
Special:		
Mine dusting or acid water treatment	W	W
Asphalt fillers or extenders	152	3,180
Whiting or whiting substitute	W	W
Other fillers or extenders	66	1,460
Other miscellaneous uses and specified uses not listed	52	516
Unspecified:²		
Reported	14,200	146,000
Estimated	33,700	348,000
Total	83,000	975,000

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

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

²Reported and estimated production without a breakdown by end use.

TABLE 4
PENNSYLVANIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2009, 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	W	W	W	W	W	W
Coarse aggregate, graded ³	W	W	W	W	W	W
Fine aggregate (-¾ inch) ⁴	W	W	W	W	W	W
Coarse and fine aggregates ⁵	W	W	W	W	W	W
Other construction materials	31	307	--	--	787	6,860
Agricultural ⁶	W	W	W	W	W	W
Chemical and metallurgical ⁷	--	--	W	W	W	W
Special ⁸	--	--	W	W	W	W
Other miscellaneous uses and specified uses not listed	--	--	24	216	--	--
Unspecified: ⁹						
Reported	957	9,440	1,960	20,300	4,510	44,500
Estimated	5,490	53,700	5,350	58,800	9,450	97,100
Total	7,140	68,300	11,000	112,000	21,200	221,000
	District 4					
	Quantity	Value				
Construction:						
Coarse aggregate (+1½ inch) ²	W	W				
Coarse aggregate, graded ³	7,450	68,100				
Fine aggregate (-¾ inch) ⁴	3,100	30,100				
Coarse and fine aggregates ⁵	8,220	203,000				
Other construction materials	203	1,930				
Agricultural ⁶	W	W				
Chemical and metallurgical ⁷	2,620	34,400				
Special ⁸	W	W				
Other miscellaneous uses and specified uses not listed	28	301				
Unspecified: ⁹						
Reported	6,770	72,000				
Estimated	13,400	138,000				
Total	43,700	574,000				

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, roofing granules, terrazzo and exposed aggregate, unpaved road surfacing, and other coarse and fine aggregates.

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

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

⁸Includes asphalt fillers or extenders, mine dusting or acid water treatment, whiting or whiting substitute, 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 2009,
BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	1,170	\$12,200	\$10.42
Concrete products (blocks, bricks, pipe, decorative, etc.) ²	53	448	8.45
Asphaltic concrete aggregates and other bituminous mixtures	488	4,640	9.50
Road base and coverings	868	5,900	6.80
Fill	1,340	6,080	4.53
Snow and ice control	173	1,200	6.96
Other miscellaneous uses ³	323	3,610	11.18
Unspecified: ⁴			
Reported	1,470	13,000	8.84
Estimated	8,020	67,500	8.41
Total or average	13,900	114,000	8.24

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

²Includes plaster and gunite sands.

³Includes railroad ballast.

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

TABLE 6
PENNSYLVANIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2009,
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	571	4,990	307	3,250	--	--
Asphaltic concrete aggregates and road base materials	702	5,350	402	3,140	W	W
Fill	46	255	139	343	W	W
Other miscellaneous uses ³	180	1,250	4	64	15	162
Unspecified: ⁴						
Reported	89	746	345	3,050	873	7,710
Estimated	1,790	15,900	1,730	13,700	4,250	35,700
Total	3,370	28,500	2,930	23,500	5,140	43,600
			District 4		Unspecified districts	
			Quantity	Value	Quantity	Value
Concrete aggregates and concrete products ²			342	4,380	1	5
Asphaltic concrete aggregates and road base materials			237	1,880	W	W
Fill			1,140	5,360	W	W
Other miscellaneous uses ³			300	3,460	7	11
Unspecified: ⁴						
Reported			159	1,460	--	--
Estimated			248	2,120	--	--
Total			2,430	18,700	23	156

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 gunite sands.

³Includes railroad ballast and snow and ice control.

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