THE MINERAL INDUSTRY OF PENNSYLVANIA

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

Pennsylvania ranked 12th among the 50 States in total nonfuel mineral production value[1] in 1995, down from 11th in 1994, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $1.05 billion, a 6% increase from that of 1994. This followed an 8.7% increase from 1993 to 1994 (based on final data). The State accounted for almost 3% of the U.S. total nonfuel mineral production value.

Pennsylvania continued to be among the Nation's leading producers of crushed stone, portland cement, lime, and masonry cement (in descending order of value); these four commodities accounted for 90% of the State's total nonfuel mineral production value. Most of the increase in value in 1995 resulted from the $56 million, or 12%, rise in crushed stone value. In 1994, the increased values of crushed stone and portland cement accounted for about 90% of that year's increase. Compared with 1994, other nonfuel minerals that increased in value in 1995 were lime, dimension stone, and common clays. Decreases were reported for construction sand and gravel, portland cement, masonry cement, and tripoli.

Based on USGS estimates of the quantities produced in the 50 States in 1995, Pennsylvania dropped from first to second in crushed stone. The State remained third in portland cement, fourth in lime, and fourth of the four States that produce tripoli. While Pennsylvania climbed from eighth to sixth in dimension stone, it was seventh in peat production, and one of the top eight masonry cement-producing States. Significant quantities of construction and industrial sand and gravel and common clays were produced in the State. Pennsylvania is exclusively an industrial mineral- and coal-producing State; metals that were produced in the State, especially steel, were processed from materials received from other domestic or foreign sources. Pennsylvania continued to be the Nation's third leading raw steel-manufacturing State with an estimated output of almost 8.3 million metric tons[2] (9.2 million short tons) of raw steel, as reported by the American Iron and Steel Institute.

The Pennsylvania Geological Survey[3] reported that the aggregate industry was poised to respond to major infrastructure repairs as a result of the harsh winter and flooding associated with record snowfalls during the winter of 1995-96. Unfortunately, the Department of Transportation's funds for this period of time were depleted. Nonetheless, the expansion of existing operations and the initiation of a grassroots exploration in the State were indicated by about 30 aggregate operations based on 1995 applications made to the State for such activities. Sand and gravel operators led the way. Twelve sand and gravel producers applied for more than 350 hectares (860 acres) of new mining reserves, 75% of which

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN PENNSYLVANIA[1] [2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
Cement:							
Masonry	metric tons	248,000	$18,700	245,000	$19,300	236,000	$18,600
Portland	do.	5,370,000	283,000	5,630,000	315,000	5,610,000	314,000
Clays	thousand metric tons	765	3,780	811	4,040	919	4,300
Gemstones		NA	1	NA	1	NA	1
Lime	thousand metric tons	1,540	95,400	1,590	95,500	1,620	101,000
Peat	metric tons	9,000	249	10,000	296	[3]15,200	[3]291
Sand and gravel (construction)	thousand metric tons	[e]16,100	[e]83,900	15,900	89,700	15,100	86,800
Stone:							
Crushed	do.	[r 4]70,100	[r 4]409,000	76,700	462,000	83,500	518,000
Dimension	metric tons	35,700	9,890	[4]43,700	[4]7,280	69,900	12,700
Total[5]		XX	[r]903,000	XX	[r]992,000	XX	1,050,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Data series changed to production beginning in 1995, prior years shipment data may not be comparable.
[4]Excludes certain stones that must be concealed to avoid disclosing company proprietary data.
[5]Partial total, excludes values which must be concealed to avoid disclosing company proprietary data.

lay behind the glacial border in the extreme northwestern portion of the State. Ten crushed stone operators applied for more than 400 hectares (1,000 acres) of new reserves. Six of the 1995 crushed stone applications were for western Pennsylvania and fell into two categories. These included the continuing development of underground operations, particularly in relatively flat-lying Carboniferous Age limestones, and the plans of coal companies to produce aggregates as a coproduct during their coal strip mining process. An eastern Pennsylvania operator applied for a permit to remine an abandoned magnetite mine mostly for traprock.

Bellefonte Lime Co. purchased the assets, real property, and mineral rights for the production of lime and limestone of its nearby competitor Centre Lime and Stone Co. Acquisition of Centre doubled Bellefonte's lime production capacity and strengthened its position in the markets of the Mid-Atlantic and Northeastern States.

Exploration for high-purity carbonates continued, particularly in central Pennsylvania where folded beds of Ordovician carbonate rock are quite pure in minable thicknesses. Global Stone purchased Delta Carbonate, which produces carbonate whiting, a pure fine white form of calcium carbonate, located in the more geologically complex York Valley in the south-central portion of the State.

Development of another industrial mineral resource, "slabby-bedded," 75% calcium carbonate stone deposits that contain clay, is undergoing some growth and holds some potential promise. This material would not be considered as a source of aggregate but it performs exceptionally well as a scrubbing agent for sulfur capture in cogeneration, fluidized-bed combustion powerplants. Many of the 20 or so plants in the eastern portion of the State have begun using this material. A potentially larger scrubbing market is the coal-fired powerplants. Recent individual powerplant requests for proposals (RFP's) have included a call for bids to supply up to 272,000 tons (300,000 short tons) of sorbent per year.

According to the Department of Environmental Protection's (DEP) Bureau of Mining and Reclamation, the building stone industry continued to expand in terms of the number of operators seeking permits and the tonnage and value of product produced annually. With the permit application of another 22 bluestone quarries, there are well over 100 active 0.4 to 2 hectare (1 to 5 acre) quarries in extreme northeastern Pennsylvania, most of which are in Susquehanna County. In addition to the famous slate and "black granite" of eastern Pennsylvania, sandstone is also a major source of building and dimension stone in the State.

Preliminary figures from DEP's Bureau of Deep Mine Safety indicated that bituminous coal production for 1995 was slightly more than the previous year, totaling approximately 55 million metric tons, with strip-mine tonnage continuing to decline and deep-mine production continuing to increase. Deepmining accounted for about 74% of all bituminous production, with a majority of this coming from Greene County longwall mines developed in the Pittsburgh seam. Further information about coal, a fuel mineral, may be obtained by contacting the Pennsylvania Geological Survey.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or 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 1995 USGS mineral production data are estimates as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]All tons are metric tons unless otherwise specified.

[3]This report includes information provided by the Pennsylvania Geological Survey.

TABLE 2

PENNSYLVANIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit Value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	935	$6,180	$6.61
Filter stone	527	3,110	5.90
Other coarse aggregate[3]	493	2,960	6.01
Coarse aggregate, graded:			
Concrete aggregate, coarse	7,130	41,600	5.84
Bituminous aggregate, coarse	6,750	39,000	5.77
Bituminous surface-treatment aggregate	2,530	17,000	6.72
Railroad ballast	794	4,520	5.69
Other graded coarse aggregate	3,570	22,900	6.42
Fine aggregate (-3/8 inch):			
Stone sand, concrete	855	5,020	5.87
Stone sand, bituminous mix or seal	3,390	19,700	5.82
Screening, undesignated	1,360	7,800	5.75
Other fine aggregate	268	1,850	6.90
Coarse and fine aggregates:			
Graded road base or subbase	13,100	67,100	5.12
Unpaved road surfacing	2,040	10,800	5.26
Terrazzo and exposed aggregate	64	1,330	20.80
Crusher run or fill or waste	1,350	4,910	3.63
Other coarse and fine aggregates	4,430	26,600	6.00
Other construction materials[4]	1,750	17,300	9.88
Agricultural: Agricultural limestone[5]	819	9,350	11.40
Chemical and metallurgical:			
Cement manufacture	4,940	26,900	5.45
Lime manufacture	583	4,140	7.11
Flux stone	W	W	11.90
Sulfur oxide removal	361	3,980	11.00
Special:			
Mine dusting or acid water treatment	35	522	14.90
Asphalt fillers or extenders	481	5,390	11.20
Whiting or whiting substitute	W	W	37.80
Other fillers or extenders	9	129	14.30
Other specified uses not listed	378	3,160	8.36
Unspecified:[6]			
Actual	11,200	67,600	6.05
Estimated	6,550	40,900	6.23
Total	76,700	462,000	6.02

W Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."

[1]Includes dolomite, granite, limestone, limestone-dolomite, marble, miscellaneous stone, sandstone and quartzite, and traprock.

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

[3]Includes macadam.

[4]Includes drain fields and roofing granules.

[5]Includes other agricultural uses and poultry grit and mineral food.

[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

PENNSYLVANIA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	[r]111	[r]40,300	[r]$233,000	[r]$5.77	110	44,000	$256,000	$5.83
Dolomite	[r]20	[r]12,900	[r]76,900	[r]5.96	18	14,700	90,000	6.13
Sandstone and quartzite	[r]35	[r]6,060	[r]38,300	[r]6.32	37	7,030	45,500	6.46
Traprock	[r]10	[r]2,340	[r]13,400	[r]5.73	11	2,650	21,700	8.21
Granite	[r]7	[r]2,590	[r]17,000	[r]6.56	7	2,570	15,800	6.13
Marble	—	—	—	—	1	476	3,210	6.73
Miscellaneous stone	16	5,850	30,300	5.18	15	5,310	29,300	5.52
Total	XX	[r]70,100	[r]409,000	[r]5.83	XX	76,700	462,000	6.02

[r]Revised. XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes "limestone-dolomite" reported with no distinction between the two.

TABLE 4

PENNSYLVANIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[2]	W	W	W	W	549	3,660	1,060	6,660
Coarse aggregate, graded[3]	W	5,680	W	7,860	4,820	32,100	13,400	79,400
Fine aggregate (-3/8 inch)[4]	377	W	W	W	1,110	6,750	3,840	23,100
Coarse and fine aggregate[5]	782	W	2,440	W	4,800	28,500	13,400	77,800
Other construction materials[6]	1,220	4,610	2,290	16,300	8	51	1,230	7,270
Agricultural[7]	14	208	49	448	50	596	707	8,100
Chemical and metallurgical[8]	571	4,040	([9])	([9])	([9])	([9])	([9])	([9])
Special[10]	—	—	([9])	([9])	([9])	([9])	([9])	([9])
Other miscellaneous uses[11]	63	70	243	2,720	1,220	8,200	4,690	29,200
Unspecified:[12]								
Actual	—	—	719	4,710	4,220	25,900	6,230	36,900
Estimated	817	5,830	522	3,200	476	3,360	4,740	28,500
Total	3,840	20,400	6,260	35,300	17,200	109,000	49,300	297,000

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.
[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[5]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), other coarse and fine aggregates, and roofing granules.
[6]Includes drain fields.
[7]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
[8]Includes cement manufacture, flux stone, lime manufacture, and sulfur oxide removal.
[9]Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."
[10]Includes asphalt fillers or extenders, mine dusting or acid water treatment, other fillers or extenders, and whiting or whiting substitute.
[11]Includes other specified uses not listed.
[12]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

PENNSYLVANIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	5,210	$33,300	$6.40
Plaster and gunite sands	121	916	7.57
Concrete products (blocks, brick, pipe, decorative, etc.)	489	3,540	7.23
Asphaltic concrete aggregates and other bituminous mixtures	2,590	15,700	6.05
Road base and coverings[2]	2,230	11,200	5.00
Fill	424	1,920	4.53
Snow and ice control	327	2,000	6.11
Roofing granules	12	143	11.90
Filtration	126	958	7.60
Other[3]	464	2,320	5.00
Unspecified:[4]			
Actual	2,330	9,140	3.93
Estimated	1,590	8,590	5.42
Total or average	15,900	89,700	5.64

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement).
[3]Includes railroad ballast.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

PENNSYLVANIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	823	4,130	1,400	9,060	2,070	13,900	1,520	10,600
Asphaltic/bituminous mixtures	372	2,250	573	3,650	1,510	8,810	134	950
Road base and coverings[3]	1,360	6,370	330	1,620	503	2,920	39	240
Fill	180	459	44	171	61	259	139	1,030
Snow and ice control	132	796	100	665	65	323	29	215
Other miscellaneous uses[4]	183	941	111	754	169	695	138	1,030
Unspecified:[5]								
Actual	239	1,590	58	408	892	2,100	1,140	5,040
Estimated	869	3,770	348	1,950	102	501	267	2,370
Total	4,160	20,300	2,960	18,300	5,370	29,600	3,410	21,500

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (cement).
[4]Includes filtration and railroad ballast.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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