THE MINERAL INDUSTRY OF PENNSYLVANIA

This chapter has been prepared under a Memorandum of Understanding between the 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.

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In 1989, the value of nonfuel mineral production in Pennsylvania was about $1 billion. Value exceeded 1 billion for the third year in a row. In the decade of the 1980's, Pennsylvania produced nonfuel minerals valued at nearly $8 billion. Crushed stone, the State's leading mineral commodity, accounted for $3.1 billion of that total. During the decade, crushed stone production surpassed that of coal for the first time in State history.

TRENDS AND DEVELOPMENTS

During the 1980's, Pennsylvania's minerals industry shifted from one noted for production of coal and steel to one that became the Nation's top producer of crushed stone. The change occurred primarily because of increased environmental regulations and international competition, which kept the price of coal and steel stagnant and depressed. In contrast, demand by the construction industry for mineral aggregates began to surge in the mid-1980's and continued at high levels through the end of the decade. Mineral aggregates were sold generally within a 50-mile radius of the mine site; thus, prices and competition were most influenced by local and regional conditions. A 10-year, $11.7 billion highway construction and repair program initiated by the State in 1985, along with a major expansion at the airport in the Pittsburgh area, provided a stable market for stone and sand and gravel producers.

This trend was expected to continue in the 1990's, particularly if Federal clean air legislation, proposed in 1989, were enacted. High-sulfur content coal produced in Pennsylvania and steel companies, particularly those with coke facilities, were expected to be adversely affected by the more stringent pollution control requirements included in the proposed legislation.

EMPLOYMENT

In 1989, Pennsylvania employed 28,000 workers in mining and 92,000 workers in primary metals, about the same as the year before.[3]

Compared with figures of 10 years ago, jobs in mining dropped by 46.2% and those in primary metals by 54.9%.

TABLE 1

NONFUEL MINERAL PRODUCTION IN PENNSYLVANIA[1]

Mineral		1987 Quantity	1987 Value (thousands)	1988 Quantity	1988 Value (thousands)	1989 Quantity	1989 Value (thousands)
Cement:							
Masonry	thousand short tons	397	$30,464	391	$28,713	349	$26,473
Portland	do.	6,325	334,709	6,309	329,634	5,757	301,980
Clays[2]	metric tons	1,094,176	4,751	1,248,139	5,843	1,049,973	4,936
Gem stones		NA	5	NA	5	NA	5
Lime	thousand short tons	1,574	93,430	1,641	91,214	1,660	92,139
Peat	do.	18	513	21	736	20	746
Sand and gravel (construction)	do.	e14,800	e72,900	19,826	91,966	e19,500	e94,600
Stone:							
Crushed	do.	97,213	458,676	e104,600	e470,700	3 93,123	3 455,004
Dimension	short tons	60,118	10,177	e59,022	e9,584	44,267	10,032
Combined value of clays (kaolin), mica (scrap), sand and gravel (industrial), stone (crushed granite, 1989), and tripoli (1987-88)		XX	10,872	XX	14,098	XX	14,754
Total		XX	1,016,497	XX	1,042,493	XX	1,000,669

e Estimated. NA Not available. XX Not applicable.

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

[2] Excludes certain clays; kind and value included with "Combined value" figure.

[3] Excludes certain stones; kind and value included with "Combined value" figure.

In 1989, employment in the construction industry increased over that of 1988 by 4.3% to 241,000 workers. Construction industry employment in 1989 was about 18% higher than that in 1979.

LEGISLATION AND GOVERNMENT PROGRAMS

Environment-related legislation dominated the 1989 session of the Pennsylvania General Assembly. Bills signed into law included provisions to prevent spills and leaks from aboveground and underground petroleum product storage tanks, protect the Great Lakes from toxic substances, and study ways of sealing underground coal mines to prevent acid mine drainage. Other provisions signed banned laundry detergents with phosphates and created a new program for response to nuclear powerplant emergencies.

Legislation introduced in 1989 and carried over for action in 1990 included bills to fund a $2 million program for plugging abandoned and orphaned oil and gas wells, to create a $5 million Pennsylvania Remining Fund to encourage mine operators to remine and reclaim abandoned mine lands, and to help control ground-level ozone air pollution by setting standards on the evaporation rate of gasoline.

The Pennsylvania Bureau of Topographic and Geologic Survey was the primary State agency involved in mineral-related studies and research. In 1989, the Survey continued work on identifying sources of high-purity carbonates, as well as evaluating the potential use of mica, silica, and talc for mineral fillers. Initiated in 1989 was a feasibility study of the coalbed methane resources in the State. Data were obtained in Armstrong, Cambria, Somerset, and Greene Counties from premining degasification holes and from methane recovery test projects. A summary of these and other Survey projects was published.[4]

REVIEW BY NONFUEL MINERAL COMMODITIES

Industrial Minerals

The commodities of cement, lime, construction sand and gravel, and crushed stone again accounted for the vast majority of Pennsylvania's value of nonfuel mineral production. Production of these commodities declined with the exception of lime for which a small increase in output was reported. Despite the decline in 1989, production remained well above the pre-1986 levels and indicated demand from the construction industry, the primary consumer of industrial minerals, had remained strong in 1989.

Cement.—Production of portland cement declined by about 10% in 1989 compared with that of 1988. The State remained the Nation's third leading producer, accounting for 8% of the U.S. output. During the year, Coplay Cement Co. began a $20 million project to increase production capacity by 45% at its Nazareth plant in Northampton County.

Lime.—Pennsylvania ranked third nationally in lime production. Output of 1.6 million short tons was about the same as in 1988.

Corson Lime Co., Montgomery County, was denied permission to build a $3 million enclosed conveyor belt over a 1½-mile stretch of roadway.[5] Corson Lime had planned to convey crushed limestone from its quarry to the lime plant. Whitemarsh Township Planning Commission officials denied Corson's application for a zoning and building permit, calling the plan inconsistent with the fabric of the community.

Another lime producer, Bellefonte Lime Co., Centre County, sought permission to open a limestone quarry on a 50-acre site in Benner Township. In 1989, Bellefonte produced lime from limestone mined at a quarry in Pleasant Gap. Permission for the new quarry was sought because only an estimated 3 years of limestone reserves remain at the Pleasant Gap site. At yearend, the proposal remained pending before the local planning commission.

Sand and Gravel.—Construction sand and gravel production is surveyed by the Bureau of Mines for even-numbered years only; data for odd-numbered years are based on annual company estimates. This chapter contains estimates for 1987 and 1989 and actual data for 1988.

Estimated production of construction sand and gravel of about 19.5 million short tons was about the same as that reported in 1988.

Stone.—Stone production is surveyed by the Bureau of Mines for odd-numbered years only; data for even-numbered years are based on annual company estimates. This chapter contains actual data for 1987 and 1989 and estimates for 1988.

Pennsylvania stone statistics are compiled by geographical districts as depicted in the State map. Table 4 presents end-use statistics for Pennsylvania's four districts.

TABLE 2

PENNSYLVANIA: LIME SOLD OR USED BY PRODUCERS, BY USE

Use	1988		1989	
	Quantity (short tons)	Value (thousands)	Quantity (short tons)	Value (thousands)
Agriculture	17,876	$1,010	16,530	$1,109
Acid water neutrilization	80,534	4,595	56,704	2,706
Paper and pulp	31,025	1,483	26,371	1,230
Steel:				
Basic oxygen	490,873	24,555	450,862	22,737
Electric	213,556	10,152	220,397	10,813
Sewage treatment	74,348	4,284	109,852	4,109
Water purification	33,338	r1,853	54,657	2,562
Other[1]	699,588	r43,282	724,863	46,873
Total	1,641,138	91,214	1,660,236	92,139

r Revised.

[1] Includes glass, industrial solid waste, ladle desulfurization, open-hearth steel, ore concentration, other chemical and industrial, other metallurgy, petroleum refining, refractory, road stabilization, sugar refining, sulfur removal, tanning, and wire drawing.

Crushed.—In 1989, production of crushed stone accounted for approximately one-half of Pennsylvania's value of nonfuel mineral production. In 1980, stone had accounted for only about one-third of the State's value. Crushed stone output for the decade totaled 700 million short tons valued at about $3.1 billion.

Crushed stone production in Pennsylvania surged from the 50- to 60-million-ton level during the 1980–86 period to an average of about 98 million tons per year from 1987 through 1989. That surge in output reflected increasing highway construction and continuing economic development in Pennsylvania and its bordering States. It also illustrated the need for mineral aggregates as a basic requirement during periods of economic growth. Crushed stone produced in Pennsylvania, particularly from the southeastern part of the State, was used extensively in adjacent States. In 1989, about 8 tons of stone was produced for each person in Pennsylvania compared with the national average ratio of 5 tons per person. For the six States bordering Pennsylvania, the ratio was about 4 tons per person.

In 1989, 104 companies operated 206 quarries producing 93 million tons of crushed stone. The top 10 producing companies operated 71 quarries and accounted for 48% of the total output. Limestone was the major rock type mined; other types included dolomite, sandstone, and traprock.

Production from district 4 in southeastern Pennsylvania accounted for about 72% of the State total. The expanding economy in this district, which included Philadelphia and Harrisburg, created strong demand for construction aggregate. Of the 19 counties in district 4, a total of 14 reported production in excess of 1 million tons with 6 producing more than 6 million tons.

In a major transaction during the year, Broyhill & Associates Inc. sold limestone quarries in Adams and Lebanon Counties to Wimpey Minerals PA Inc., a subsidiary of George Wimpey PLC of the United Kingdom.

Other Industrial Minerals.—The mineral commodities discussed following accounted for about $60 million of Pennsylvania's nonfuel mineral production value as given in table 1.

TABLE 3

PENNSYLVANIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1989, BY USE

(Thousand short tons and thousand dollars)

Use	Quantity	Value
Coarse aggregate (+1 1/2 inch):		
Macadam	305	$1,158
Riprap and jetty stone	803	4,487
Filter stone	662	3,086
Other coarse aggregate	W	W
Coarse aggregate, graded:		
Concrete aggregate, coarse	5,323	24,763
Bituminous aggregate, coarse	6,299	26,505
Bituminous surface-treatment aggregate	2,702	13,692
Railroad ballast	971	4,458
Other graded coarse agggregate	W	W
Fine aggregate (−3/8 inch):		
Stone sand, concrete	1,272	6,112
Stone sand, bituminous mix or seal	3,758	15,207
Screening, undesignated	1,670	7,196
Other fine aggregate	W	W
Coarse and fine aggregates:		
Graded road base or subbase	12,683	52,156
Unpaved road surfacing	1,336	6,015
Crusher run or fill or waste	1,443	5,670
Other coarse and fine aggregates		
Other construction materials[2]	1,583	7,311
Agricultural:		
Agricultural limestone	1,005	8,694
Poultry grit and mineral food	121	1,654
Other agricultural uses	W	W
Chemical and metallurgical:		
Cement manufacture	8,594	40,228
Lime manufacture	1,443	6,963
Dead-burned dolomite manufacture	W	W
Flux stone	91	516
Glass manufacture	W	W
Sulfur oxide removal	57	625
Special:		
Mine dusting or acid water treatment	96	1,365
Asphalt fillers or extenders	279	2,716
Whiting or whiting substitute	W	W
Other fillers or extenders	272	4,369
Roofing granules	W	W
Other miscellaneous uses:[3]		
Waste material	W	W
Other uses not listed	1,561	12,744
Unspecified:[4]		
Actual	30,938	159,716
Estimated	7,857	37,597
Total	93,124	[5]455,003

[1] Includes dolomite, limestone, sandstone, traprock, and miscellaneous stone; granite withheld to avoid disclosing company proprietary data.
[2] Includes stone used in coarse aggregates-graded and large and fine aggregates.
[3] Includes stone used in dead-burned dolomite, whiting or whiting substitute, roofing granules, drain fields, glass manufacture, and waste material.
[4] Includes production reported without a breakdown by end use and estimates for nonrespondents.
[5] Data do not add to total shown because of independent rounding.

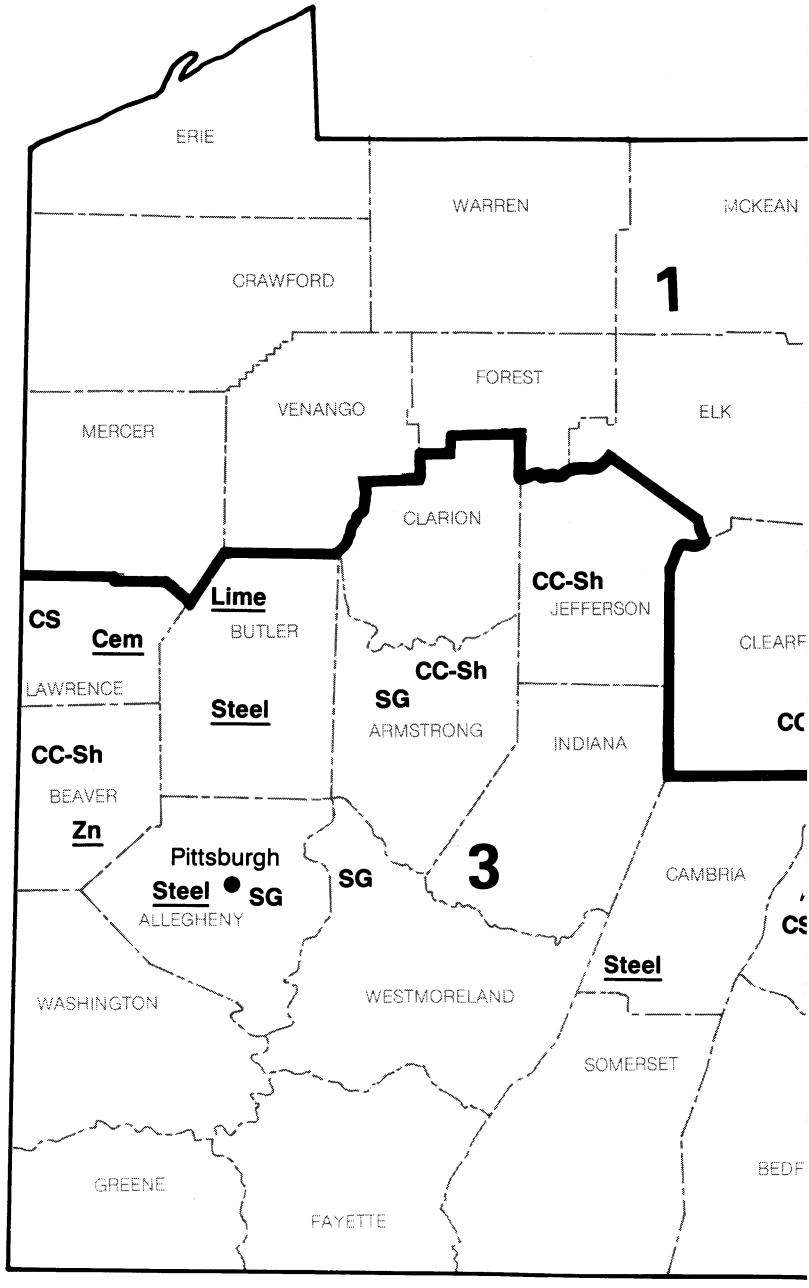
PENNS

State boundary
County boundary
Capital
City
Crushed stone/sand & gravel districts

MINERAL SYMBOLS

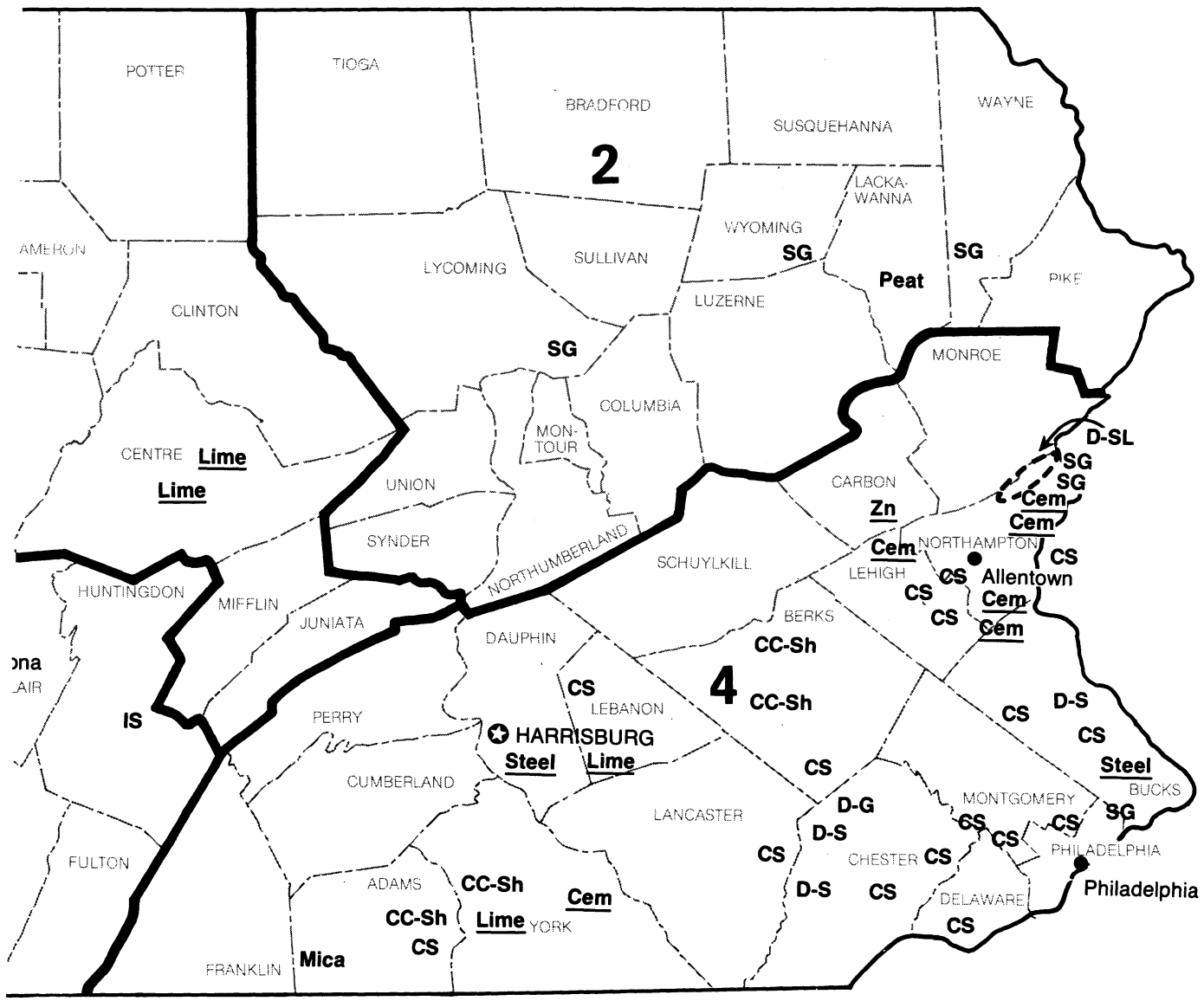
CC-Sh	Common Clay & Shale
Cem	Cement plant
CS	Crushed Stone
D-G	Dimension Granite
D-S	Dimension Sandstone
D-SL	Dimension Slate
IS	Industrial Sand
Lime	Lime plant
Mica	Mica
Peat	Peat
SG	Sand and Gravel
Steel	Iron and Steel plant
Zn	Zinc plant

Concentration of mineral operations



Principal Mineral-Producing Localities

VANIA


POTTER
TIOGA
BRADFORD
2
SUSQUEHANNA
WAYNE
LACKA-
WANNA
WYOMING
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Peat
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PIKE
AMERON
LYCOMING
SULLIVAN
LUZERNE
CLINTON
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MONROE
COLUMBIA
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Lime
UNION
CARBON
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SYNDER
NORTHUMBERLAND
SCHUYLKILL
Cem
NORTHAMPTON
CS
LEHIGH
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Allentown
CS
Cem
CS
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HUNTINGDON
MIFFLIN
JUNIATA
BERKS
DAUPHIN
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PHILADELPHIA
FULTON
D-S
CS
Philadelphia
ADAMS
CC-Sh
Cem
DELAWARE
CC-Sh
Lime
YORK
CS
CS
FRANKLIN
Mica

TABLE 4

PENNSYLVANIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1989, BY USE AND DISTRICT

(Thousand short tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Coarse aggregates:								
Coarse aggregate (+1 1/2 inch)[1]	302	$1,150	89	$391	536	$3,489	1,092	$4,951
Coarse aggregate, graded[2]	918	2,674	645	2,782	3,215	17,828	10,607	46,544
Fine aggregate (−3/8 inch)[3]	640	1,644	364	1,486	1,295	6,025	4,439	19,531
Coarse and fine aggregates[4]	936	2,867	1,091	4,274	2,467	11,905	11,079	45,346
Other construction aggregates	—	—	44	217	375	1,534	1,164	5,559
Agricultural[5]	W	W	W	W	57	676	1,062	9,575
Chemical and metallurgical[6]	W	W	W	W	2,399	14,914	6,857	31,419
Special[7]	W	W	W	W	123	1,430	918	10,353
Other miscellaneous	1,465	7,658	113	1,249	—	—	34	217
Unspecified:								
Actual[8]	318	1,382	1,755	8,291	3,660	17,115	25,204	132,928
Estimated[9]	168	1,067	552	2,483	2,375	12,024	4,761	22,023
Total[10]	4,748	18,442	4,653	21,174	16,502	86,941	67,219	328,447

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous."

[1] Includes macadam, riprap and jetty stone, filter stone, and other coarse aggregates.

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

[3] Includes stone sand (concrete), stone sand (bituminous mix or seal), and fine aggregate (screening-undesignated).

[4] Includes crushed stone for graded road base or subbase, unpaved road surfacing, crusher run or fill or waste, and drain fields.

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

[6] Includes crushed stone for cement manufacture, lime manufacture, dead-burned dolomite, flux stone, glass manufacture, and sulfur oxide removal.

[7] Includes crushed stone for asphalt fillers or extenders, whiting or whiting substitutes, other fillers or extenders, waste material, mining dusting and acid water treatment, and roofing granules.

[8] Includes production reported without a breakdown by end use.

[9] Includes estimates for nonrespondents.

[10] Data may not add to totals shown because of independent rounding.

Pennsylvania ranked third nationally in output of masonry cement. In 1989, production was reported from 10 operations. One plant at Nazareth was inactive. More than 1 million metric tons of common and fine clays was produced in Pennsylvania from 34 pits. It should be noted that the Bureau of Mines began reporting clay statistics in metric tons in 1989. Output of kaolin, which more than tripled in 1988 from that in 1987, declined by a similar margin in 1989. Scrap mica used as a filler, primarily by the automotive industry, was mined by one company in Fairfield, Adams County. Most of the peat mined in Pennsylvania came from a three-county area in the northeastern part of the State.

Industrial sand was produced by one company in Huntingdon County. No production was reported from a small sand mining operation in Allegheny County that had been active in 1988. Pennsylvania ranked first in the United States in production of slate, a dimension stone used as roofing material, blackboards, and in pool tables. Other types of dimension stone quarried in the State included bluestone, diabase, quartzite, and sandstone. A small quantity of tripoli, or rottenstone, was processed in Northumberland County and sold as filler and for use in polishing compounds.

Mineral commodities processed in Pennsylvania included those that were imported, shipped from domestic sources outside the State, or manufactured into higher value end products. Commodities surveyed by the Bureau of Mines were synthetic graphite, iodine, iron oxide materials, expanded perlite, sulfur (recovered), sulfuric acid, and exfoliated vermiculite. The combined valued of these commodities was about $85 million.

Metals

No metals were mined in Pennsylvania. Metals discussed in this section were processed from materials received from both foreign and domestic sources. Production and value data for these metals are not included in table 1.

Iron and Steel.—Steel production declined to about 11.9 million short tons, according to data published in the Pennsylvania Business Survey by The Pennsylvania State University.

Pig iron shipments were no longer reported to the Bureau of Mines beginning in 1988 because several of the Nation's major producers declined to respond to the Bureau survey. However, 6 years of data on steel production and pig iron shipments showed Pennsylvania produced steel at about a 2:1 ratio to pig iron. Based on that ratio, pig iron shipments in 1989 were estimated at 6 million tons, a decrease of 0.9 million tons compared with the 1988 total.

Pennsylvania's and the Nation's leading steel producer, USX Corp., began two major projects during the year. In September, USX broke ground at its Edgar Thomson Works for a $250 million modernization program. The firm planned to install a continuous caster capable of producing 2.6 million short tons of steel annually. Installation of the caster was part of a contract agreement with the United Steelworkers Union settled in 1987 after a 6-month strike. USX also began a 3-year, $89 million project

to upgrade environmental controls at its coke works in Clairton. About 4.5 million short tons of coke was produced at Clairton and sold to steelmaking operations in Michigan, Ohio, Pennsylvania, and West Virginia.[6]

Zinc.—Zinc Corp. of America (ZCA) operated a primary zinc refinery at Monaca, PA. ZCA was also involved in production of secondary zinc at a plant in Palmerton operated by Horsehead Resource Development Co. (HRD). HRD recovered cadmium, lead, and zinc from steelmaking waste dust generated in electric arc furnaces.

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[2] Economic geologist, Pennsylvania Bureau of Topographic and Geologic Survey, Department of Environmental Resources, Harrisburg, PA.

[3] Pennsylvania Business Survey. College of Business Admin., The Pennsylvania State Univ., University Park, PA, Feb. 1990, p. 4.

[4] Pennsylvania Geology. Bureau of Topographic and Geologic Survey. V. 20, No. 4, July 1989, 32 pp.

[5] Montgomery County Observer (Center Square, PA). Whitemarsh Denies Corson Proposal. Aug. 2, 1989, p. 2.

[6] Pittsburgh (PA) Post-Gazette. More Cash For Coke-Oven Controls. Dec. 15, 1989, pp. 21-22.

TABLE 5

PRINCIPAL PRODUCERS

Commodity and company	Address	Type of activity	County
Cement:			
Allentown Portland Cement Co.	Box 199 Blandon, PA 19510	Plant and quarry	Berks.
Coplay Cement Co.	Drawer 32 Nazareth, PA 18064	Plant and quarries	Lehigh and Northampton.
LaFarge Corp.	5160 Main St. Whitehall, PA 18052	Plant	Lehigh.
Hercules Cement Co.	Center St. Stockertown, PA 18083	Plant and quarry	Northampton.
Lone Star Industries Inc.	Wood and Prospect St. Box 270 Nazareth, PA 18064	Plant	Do.
Clays and shale:			
L. D. Baumgardner Coal Co. Inc.	Box 104, R.D. 3 Phillipsburg, PA 16866	Pit	Clearfield.
Glen-Gery Corp.	Box 1542 Reading, PA 19603	Pits and plant	Adams, Berks, York.
Medusa Corp.	Box 5668 Cleveland, OH 44101	Pit	Lawrence.
Lime:			
J. E. Baker Co.	320 North Baker Rd. York, PA 17404	Plant and quarry	York.
Bellefonte Lime Co. Inc.	Box 448, North Thomas St. Bellefonte, PA 16823	Plant and quarries	Do.
Wimpey Minerals PA Inc.[1]	Box 468 Hanover, PA 17331	do.	Adams and Lebanon.
Centre Lime & Stone Co. Inc.	Box 130 Pleasant Gap, PA 16823	Plant and quarry	Centre.
Mercer Lime & Stone Co.	525 William Penn Pl. Pittsburgh, PA 15219	Plant	Butler.
Peat:			
Hyponex Corp.	2013 South Anthony Blvd. Fort Wayne, IN 46803	Bog and plant	Monroe.
Lake Benton Peat Moss Co. Inc.	R.D. 1 Dalton, PA 18414	Bog	Lackawanna.

See footnote at end of table.

TABLE 5—Continued

PRINCIPAL PRODUCERS

Commodity and company	Address	Type of activity	County
Sand and gravel:			
Construction:			
Davison Sand & Gravel Co.	3d Ave. and 4th St. New Kensington, PA 15068	Dredge and pits	Armstrong and Westmoreland.
Dravo Corp.	4800 Grand Ave. Pittsburgh, PA 15222	Dredge, pit, plant	Allegheny and Beaver.
Glacial Sand & Gravel Co.	Box 1022 Kittanning, PA 16201	do.	Armstrong.
Stabler Co. Inc.[1]	Box 3188 Wescoville, PA 18106	Pits and plants	Bradford and Northampton.
Warner Co.	699 Bristol Pike Morrisville, PA 19067	Pit and plant	Bucks.
Wyoming Sand & Stone Co.	R.D. 1 Falls, PA 18615	do.	Wyoming.
Industrial:			
U.S. Silica Co.	Box 187 Berkeley Springs, WV 25411	Quarries and plant	Huntingdon.
Stone:			
Crushed:			
Beazer Materials & Service Inc.	436 7th Ave. Easton, PA 18042	do.	Centre, Chester, Clinton, Columbia, Delaware, Lycoming, Monroe, Montour, Tioga, York.
Eureka Stone Quarry Inc.	Lower State and Pickerton Sts. Chalfont, PA 18914	do.	Bucks, Lackawanna, Monroe, Pike.
Glasgow Inc.	Box 248 Glenside, PA 19038	do.	Chester and Montgomery.
New Enterprise Stone & Lime Co. Inc.	R.D. 3 New Enterprise, PA 16664	do.	Adams, Bedford, Blair, Centre, Cumberland, Franklin, Huntingdon, Lancaster, Somerset.
Stabler Co. Inc.	R.D. #3, Box 150 Center Valley, PA 18034	do.	Berks, Carbon, Lancaster, Lehigh, Monroe, Northampton, Susquehanna.
Dimension:			
A. Dally & Sons Inc.	Box 27, Railroad Ave. Pen Argyl, PA 18072	Quarries and mills	Northampton.
Delaware Quarries	Route 22 Lumberville, PA 18933	Quarry and plant	Bucks.
Pennsylvania Granite Corp.	Box 510 St. Peters, PA 19470	Quarries and mill	Chester.
Welsh Mountain Building Stone Inc.	227 Isabella St. Norristown, PA 19401	Quarry	Do.
Mark C. Wise Inc.	Box 208 Bowmansville, PA 17507	do.	Do.

[1] Also stone.