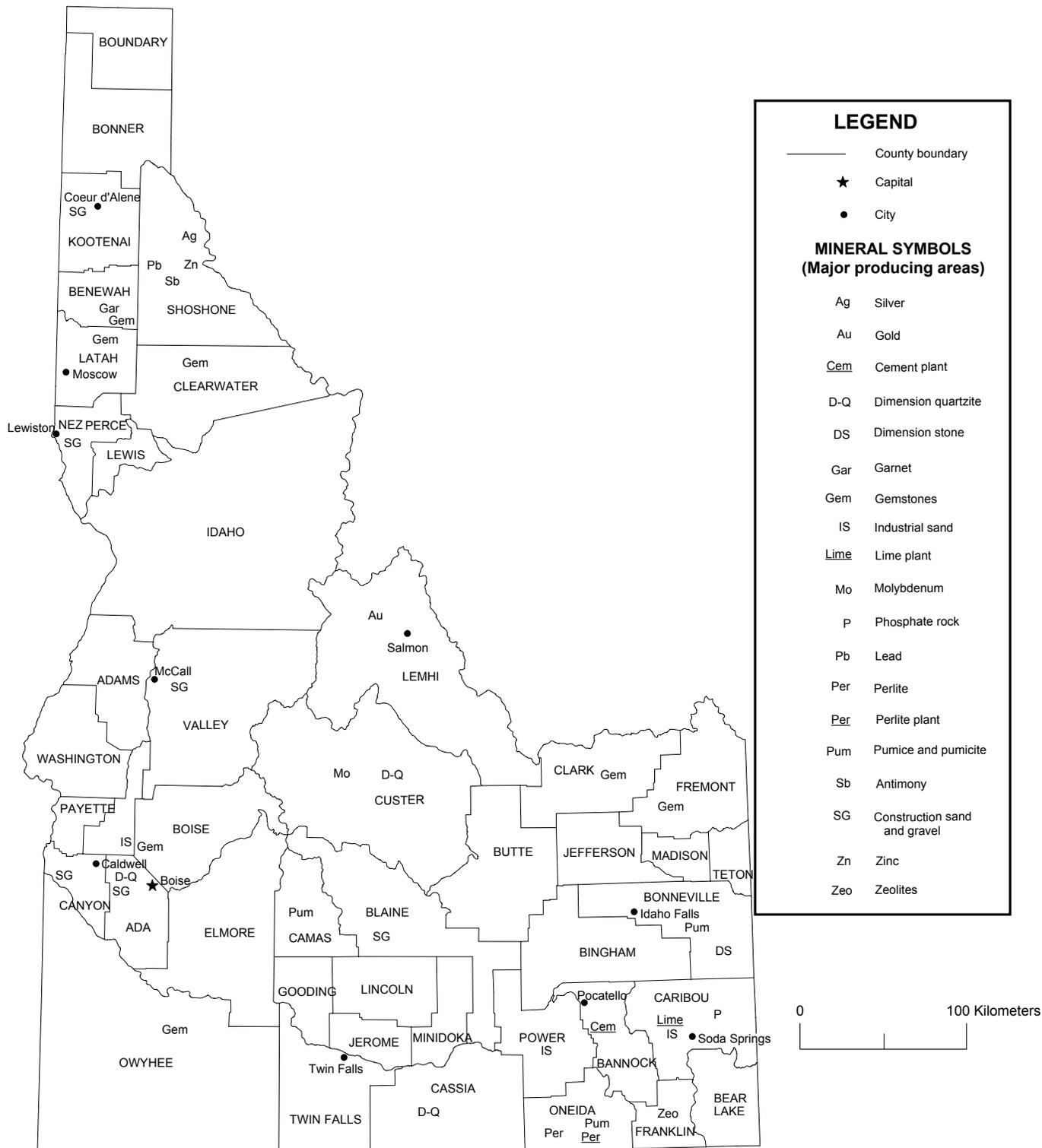


# IDAHO



Source: Idaho Geological Survey/U.S. Geological Survey (2001)

# THE MINERAL INDUSTRY OF IDAHO

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

In 2001, the estimated value<sup>1</sup> of nonfuel mineral production for Idaho was \$346 million, based upon preliminary U.S. Geological Survey (USGS) data. This was a more than 3% decrease from that of 2000<sup>2</sup> and followed a 15.2% decrease from 1999 to 2000. The State decreased to 35th from 33d in rank among the 50 States in total nonfuel mineral production value, of which Idaho accounted for about 1% of the U.S. total.

Phosphate rock, construction sand and gravel, silver, portland cement, crushed stone, molybdenum concentrates, and lead were, by value, Idaho's leading nonfuel minerals. In 2001, there were significant decreases in the values of most metals, especially those of silver, gold, molybdenum concentrates, and lead (in descending order of change); zinc production and value was up slightly. The most significant changes for industrial minerals were increases in crushed stone, phosphate rock, and lime (table 1). All other changes were slight relative to these and had little effect on the overall total value.

In 2000, many commodities had decreases in value led by drops of approximately \$25 million each in gold and phosphate rock; a withheld value in industrial sand and gravel (proprietary data); about \$6 million in molybdenum; and values in a range of \$3.7 million to about \$2 million for crushed stone, silver, portland cement, and lime (descending order of change). The only significant increases were those of a \$7.5 million rise in construction sand and gravel and a more than \$1 million increase in industrial garnet (table 1).

Based upon USGS estimates of the quantities produced in the United States during 2001, Idaho remained the only State to produce antimony ore, first of three industrial-garnet-producing States, third in silver and lead (descending order of value), fourth in molybdenum and pumice, sixth in zinc and feldspar, and ninth in gold. While the State rose to second from third in phosphate rock and to seventh from eighth in gemstones, it

dropped to sixth from fifth in zeolites. Additionally, the State was a significant producer of construction and industrial sand and gravel and dimension stone.

The Idaho Geological Survey<sup>3</sup> (IGS) provided the narrative information that follows. Production data in the following text are those reported by the IGS, based upon its own survey and estimates. The data differ from some production figures reported by the USGS. Idaho's mining industry suffered from the continuing low mineral commodity prices in 2001, as well as the economic recession and regulatory/environmental factors. Metal mining was especially hard hit. From 1998 to 2000, the percent of value contributed by industrial minerals rose from 50% to 59% due to metal mine closures and low metal prices. According to the Idaho Division of Financial Management, 2001 was "one of the toughest in recent memory for Idaho's mining and chemical sectors," and 2002 was projected to be as bad. Metal mining lost more than 1,000 jobs from 1997 to 2001. Mining employment dropped to 2,022 persons in 2001, a 16.6% drop from the previous year, and nonmetal mining became a larger employer than metal mining, which accounted for only 500 jobs by April 2002, according to the Idaho Department of Employment. Production of silver in the Silver Valley totaled approximately 255 metric tons (t), a significant decrease from the 401 t mined in 2000. Phosphate mining and processing remained the largest segment of Idaho's mineral industry, but it was not immune from lagging economic times. Most of the cutbacks there were recorded in the chemical industry, which lost more than 400 phosphate jobs at yearend.

Idaho's Coeur d'Alene District was one of the world's largest silver mining regions, with more than 31,000 t of silver produced from the Silver Valley. A chapter in Idaho and mining history ended on February 16, 2001, when the famous Sunshine Mine shut down. Its demise was hastened by closure of the East Helena, MT, smelter, low silver prices, and exhausted reserves. Since its discovery in 1884, the "Shine" produced more than 11,400 t of silver and considerable antimony and copper from a single underground mine. In little less than a month in 2001, the mine processed 17 t of silver before the remaining 130 workers lost their jobs. Sunshine Mining Co. had been reorganized in bankruptcy court in 2000.

Hecla Mining Co.'s Lucky Friday silver-lead mine announced layoffs and production cuts in midyear to conserve the reserves. Only 50 workers remained, and production in 2001 was about 100 t of silver. The Galena Mine, owned by Coeur d'Alene Mines Corp., was able to increase production to 140 t of silver, a 12% rise from 2000. The company introduced mechanized diesel mining in selected stopes, installed a new sand backfill

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<sup>1</sup>The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon 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 2001 USGS mineral production data published in this chapter are preliminary estimates as of August 2002 and are expected to change. For some mineral commodities, such as 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. Specialist contact information may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals/contacts/comdir.html>; alternatively, specialists' names and telephone numbers may be obtained by calling USGS information at (703) 648-4000 or by calling the USGS Earth Science Information Center at 1-888-ASK-USGS (275-8747). All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

<sup>2</sup>Values, percentage calculations, and rankings for 2000 may differ from the Minerals Yearbook, Area Reports: Domestic 2000, Volume II, owing to the revision of preliminary 2000 to final 2000 data. Data for 2001 are preliminary and are expected to change; related rankings may also change.

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<sup>3</sup>Virginia S. Gillerman, Research Economic Geologist, authored the text of the Idaho mineral industry information submitted by the Idaho Geological Survey.

system, and was rehabilitating the Galena shaft. New geologic studies and more than 12,000 meters (m) of exploration drilling have resulted in substantial new reserves and exploration discoveries, such as the high-grade 117 vein.

Thompson Creek Mining Co.'s large, open pit molybdenum mine in Custer County initiated a reduced work schedule with crews alternating between mining and running the mill. Approximately 72 employees remained, and production was about one-third of capacity as molybdenum prices remained low. Thompson Creek's higher value, lubricant-grade molybdenum production helped its bottom line.

Phosphate mining and processing was Idaho's largest mineral industry, although production declined to approximately 5 million metric tons (Mt) of ore, and market demand was down for fertilizer, a major use of the phosphoric acid produced from the ore. J.R. Simplot Co.'s Smoky Canyon Mine was the largest producer in 2001 with record production of more than 2.7 Mt, which went to their Don Acid Plant in Pocatello. The company was working on permits to expand northwards and was also drilling on its newly acquired Manning Canyon lease. Agrium Inc. mined approximately 1.4 Mt from the central portion of its Rasmussen Ridge Mine to supply ore for its fertilizer plant at Conda. Monsanto Co. was in the final stages of mining the South Pit at the Enoch Valley Mine and doing prestripping on its new South Rasmussen Ridge property. Monsanto's elemental phosphorus plant at Soda Springs remained at full production.

Astaris LLC's production from its Dry Valley Mine went to the large elemental phosphorus plant at Pocatello, but the company shut down two of its four electric furnaces early in the year, curtailing production and selling the power. In October, Astaris (a joint venture between FMC Corp. and Solutia, Inc.) shocked the city by announcing the yearend closure of the Pocatello plant, eliminating more than 400 jobs in 2001. Astaris and Agrium opened a new joint-venture plant in May at Conda. The new facility used the standard phosphoric acid product from Agrium's plant as feed and produced a wet-purified phosphoric acid (PPA), which can substitute for some of the uses of elemental phosphorus. The plant used evaporation, sulfidization, and solvent extraction circuits to purify and concentrate the phosphoric acid; it cost approximately \$80 million and employed only 25 people.

Idaho's other new operation was the Bear River Zeolite Mine in Franklin County in the southeastern corner of the State. Located a few kilometers east of Preston, the small mine is operated by a subsidiary of U.S. Antimony Corp. The quarry accesses a large deposit of potassium-rich clinoptilolite; the material is crushed, sized, and bagged on site. It is sold for water filtration, soil amendments, environmental cleanup, and other uses.

Other industrial mineral mines generally had a good year, and the market demand for construction-related materials was excellent. The hot markets for decorative rock led to expansions and new operations. L and W Stone developed a second pit and purchased new haul trucks and an excavator at their seasonal Three Rivers Quarry near Clayton in Custer County. The seasonal operation supplied a prized, variably colored argillaceous quartzite.

In Cassia County, south of Oakley, at least four companies quarried Oakley Stone, the thin-splitting micaceous quartzite used as a facing and paving stone. Northern Stone Supply Inc. was the largest producer, and Oakley Valley Stone Inc., Snake River Quartzite, and American Stone & Building Inc. also operated.

Other producers included Overman's Western Stone in north Idaho, Idaho Travertine's quarry and cutting plant near Idaho Falls, Table Rock Sandstone of Boise, and Rockworks in Challis. The latter company used a homemade slide to collect lichen-covered talus.

Emerald Creek Garnet Co., a subsidiary of Western Garnet International Ltd., operated five wash plants to recover garnets from Emerald and Carpenter Creeks in north Idaho. Business was good, and past reclamation efforts were excellent, but permitting delays on its application to mine in the St. Maries River flood plain proved frustrating to the company. Idaho star garnet gemstones were also produced in the region.

Ash Grove Cement Co. had an excellent year, producing about 240,000 t of clinker at its plant at Inkom in Bannock County. Hess Pumice Products Inc. of Malad had a good year, producing pumice for grinding television screens; their subsidiary, U.S. Grout, was marketing an ultrafine pumice grout, useful in mining applications.

Only a few exploration projects were underway during 2001. In the Coeur d'Alene District of north Idaho, New Jersey Mining Co., a subsidiary of Mine Systems Design, drilled at the New Jersey Mine in the Coeur d'Alene District. Two core holes tested an induced polarization resistivity target and intersected a gold-bearing silicified zone at depth. A group of local Silver Valley businessmen formed Sullivan Mining and announced plans to construct a new 45,000-t hydrometallurgical zinc plant and to reopen the Bunker Hill Mine in Shoshone County. Extensive studies and permitting would be needed.

At the Rescue Mine near Warren, Barramundi Gold USA added a gold wheel and Wilfley table to the mill circuit. A six-man crew also developed 122 m of drift and raises and made safety improvements at the small underground mine. At the Daddy Del placer project on the South Fork of the Salmon River, operators dug five exploration pits on the high bench gravels west of Yellow Pine.

Alchemy Ventures Ltd. and subsidiary, Alchemy Kaolin, continued to evaluate the Helmar-Bovill clay district of Latah County. In the winter of 2000-01, Alchemy drilled 41 core holes totaling 2,100 m and took a bulk sample to test the clay and potential byproducts, silica and feldspar. The State Department of Lands has requested additional economic and feasibility information before extending the 16 exploration leases.

Formation Capital Corp. officially submitted its plan for a small underground cobalt-copper mine at its Idaho Cobalt project in Lemhi County. The submission activated the National Environmental Policy Act (NEPA) permitting process under the guidance of the Salmon National Forest. Baseline environmental monitoring and the necessary, multiple technical studies and meetings were underway during the year. The company also drilled large-diameter core for metallurgical testing and obtained an option on Sunshine Mining's

hydrometallurgical facility at Kellogg. A resource update for the Idaho Cobalt project listed diluted proven and probable reserves at 1 Mt grading 0.625% cobalt, 0.49% copper, and 0.62 grams per metric ton gold.

Cleanup at the Bunker Hill Superfund site was in the final stages. The U.S. Environmental Protection Agency proposed expanding the “Superfund box” and cleanup to the entire Coeur d’Alene Basin, a move strongly opposed by local residents and State officials. Several smaller remediation projects have been successfully completed by local coalitions and agencies.

Reclamation efforts at most of Idaho’s closed gold mines were progressing well. Meridian’s Beartrack Mine was still recovering gold from the heap leach in Lemhi County. Black Pine Mining installed an innovative passive water-treatment system using iron filings and Hickenbottom drains to treat any future leachate from the valley fill pad in Cassia County. Hecla Mining, as well as Sunshine Mining, negotiated a settlement

for cleanup liability in the Silver Valley and at Hecla’s former Grouse Creek and Stibnite gold mines. Field inventories and remediation continued on “abandoned mine lands” projects on Federal and State land.

Selenium remained a serious concern in the Phosphate Reserve of southeastern Idaho, particularly after 150 sheep died after drinking from a spring near an old mine at Conda. Studies of the geochemistry of the phosphate horizons continued, and Idaho Department of Environmental Quality planned to lead an areawide risk assessment next year.

IGS, in cooperation with the USGS, published color geologic maps of the Boise Basin and Atlanta gold mining districts as a special map (M-7) and the Idaho City 100K sheet (GM-29), respectively. Through the STATEMAP program, IGS also released new geologic mapping in the Coeur d’Alene-Rathdrum, Moscow-Lewiston, Pocatello, and Sun Valley urban corridors and the digital St. Maries 100K sheet during 2001.

TABLE 1  
NONFUEL RAW MINERAL PRODUCTION IN IDAHO 1/ 2/

(Thousand metric tons and thousand dollars)

Mineral	1999		2000		2001 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Antimony metric tons	450 r/	W	W	W	300	W
Garnet, industrial do.	W	W	W	W	24,800	2,940
Gemstones	NA	368	NA	411	NA	W
Pumice and pumicite metric tons	98,600	917	W	W	W	W
Sand and gravel:						
Construction	15,500	48,200	17,500	55,700	17,200	55,500
Industrial	711	11,200	W	W	W	W
Silver 3/ metric tons	416	70,100	416	66,900	W	W
Stone:						
Crushed	4,090 r/	18,500 r/	3,500	14,800	4,800	20,800
Dimension metric tons	39,300	5,510	W	W	W	W
Zeolites do.	--	--	(4/)	NA	(4/)	NA
Combined values of cement (portland), copper, feldspar, gold, lead, lime, molybdenum concentrates, perlite (crude), phosphate rock, stone [dimension, granite, quartz, sandstone (2000-01)], vanadium ore (1999), zinc, and values indicated by symbol W	XX	266,000 r/	XX	219,000r/	XX	267,000
Total	XX	421,000 r/	XX	357,000r/	XX	346,000

r/ Revised. p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with “Combined values” data.

XX Not applicable.

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

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

3/ Recoverable content of ores, etc.

4/ Withheld to avoid disclosing company proprietary data.

TABLE 2  
IDAHO: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1999				2000			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	8	1,020	\$4,130	\$4.06	6	607	\$1,920	\$3.16
Granite	7 r/	343 r/	1,280 r/	3.74 r/	7	240	975	4.06
Quartzite	6	574	4,090	7.12	5	495	2,020	4.07
Shell	1	12	87	7.25	2	17	107	6.29
Traprock	22	1,830	7,620	4.17	24	1,990	8,960	4.51
Miscellaneous stone	12 r/	320 r/	1,290 r/	4.03 r/	16	156	773	4.96
Total or average	XX	4,090 r/	18,500 r/	4.52 r/	XX	3,500	14,800	4.21

r/ Revised. XX Not applicable.

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

TABLE 3  
IDAHO: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2000, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
<b>Construction:</b>			
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	34	\$176	\$5.18
Filter stone	11	74	6.73
Total or average	45	250	5.56
Coarse aggregate, graded:			
Concrete aggregate, coarse	W	W	5.30
Bituminous aggregate, coarse	237	1,180	4.99
Bituminous surface-treatment aggregate	61	477	7.82
Railroad ballast	W	W	9.22
Other graded coarse aggregate	116	636	5.48
Fine aggregate (-3/8 inch):			
Stone sand, concrete	68	750	11.03
Stone sand, bituminous mix or seal	(3/)	(3/)	(3/)
Screening, undesignated	59	228	3.86
Coarse and fine aggregates:			
Graded road base or subbase	425	1,750	4.11
Unpaved road surfacing	36	132	3.67
Terrazzo and exposed aggregate	64	298	4.66
Crusher run or fill or waste	122	435	3.57
Other coarse and fine aggregates	53	261	4.92
Total or average	700	2,870	4.11
<b>Agricultural:</b>			
Poultry grit and mineral food	16	56	3.50
Other agricultural uses	35	118	3.37
Total or average	51	174	3.41
<b>Chemical and metallurgical:</b>			
Cement manufacture	(4/)	(4/)	2.75
Flux stone	(4/)	(4/)	3.97
Special, mine dusting or acid water treatment	(4/)	(4/)	4.00
<b>Unspecified: 5/</b>			
Reported	923	3,730	4.04
Estimated	420	1,700	3.92
Total or average	1,350	5,400	4.01
Grand total or average	3,500	14,800	4.21

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

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

2/ Includes granite, limestone, miscellaneous stone, quartzite, shell, and traprock.

3/ Less than 1/2 unit.

4/ Withheld to avoid disclosing company proprietary data; included in "Grand total."

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

TABLE 4  
IDAHO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2000, BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	3,190	\$12,700	\$3.98
Plaster and gunite sands	43	111	2.58
Concrete products (blocks, bricks, pipe, decorative, etc.)	65	426	6.55
Asphaltic concrete aggregates and other bituminous mixtures	1,310	4,970	3.78
Road base and coverings 2/	5,820	18,300	3.14
Fill	787	2,060	2.62
Snow and ice control	131	696	5.31
Other miscellaneous uses 3/	294	1,140	3.88
Unspecified: 4/			
Reported	2,910	6,340	2.18
Estimated	3,000	9,000	3.02
Total or average	17,500	55,700	3.18

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

2/ Includes road and other stabilization (cement).

3/ Includes railroad ballast.

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