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2007 Minerals Yearbook

ALASKA [ADVANCE RELEASE]

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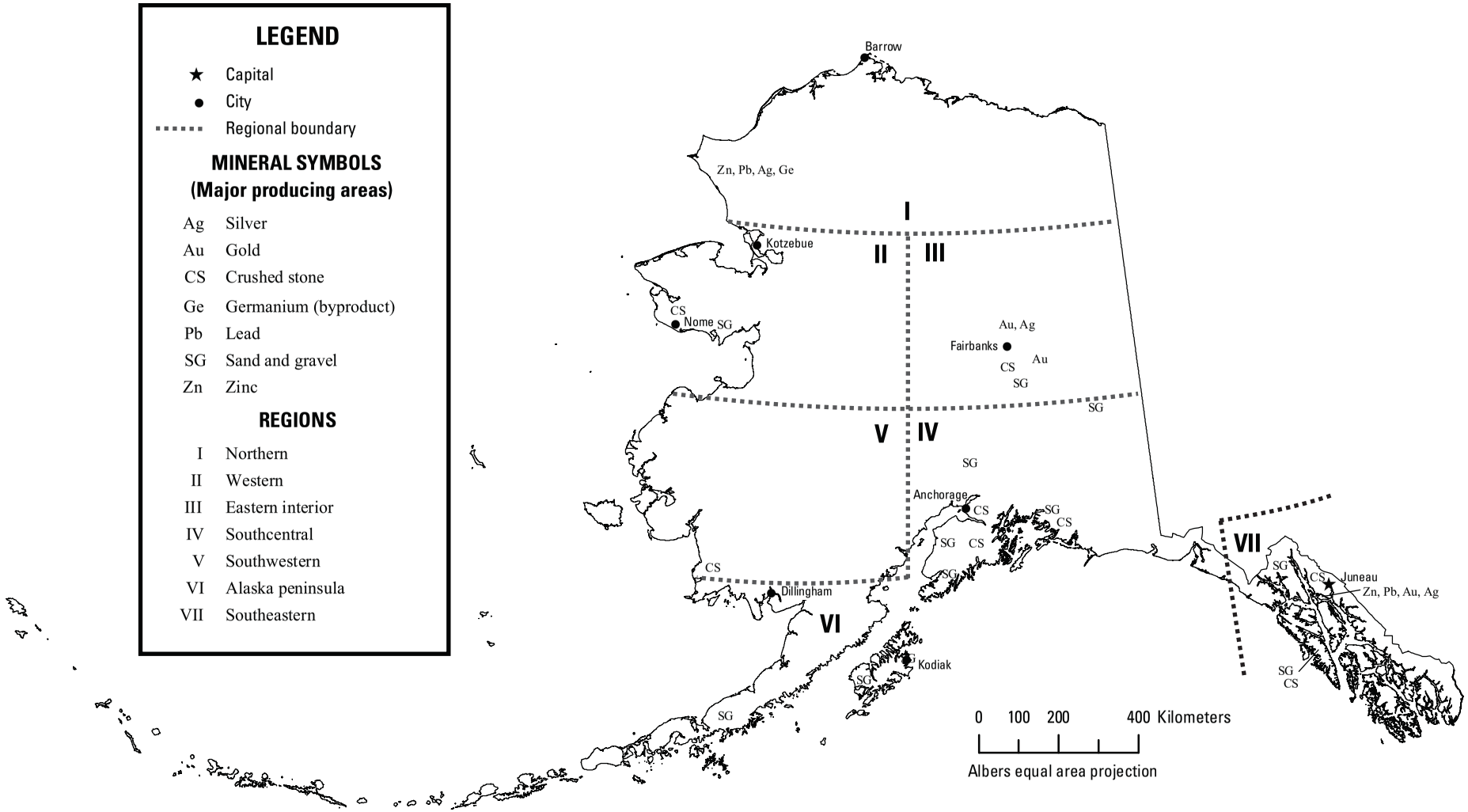
ALASKA



Source: Alaska Division of Geological and Geophysical Surveys//U.S. Geological Survey (2007).

The Mineral Industry of Alaska

In 2007, Alaska's nonfuel raw mineral production[1] was valued at $3.52 billion, based upon annual U.S. Geological Survey (USGS) data. This was $499 million, or a 16.5% increase, from the State's total nonfuel mineral value for 2006. The State remained 6th among the 50 States in total nonfuel mineral production value and accounted for about 5% of the U.S. total value. Per capita, the State led the Nation in the value of its mineral industry's nonfuel mineral production; with a population of 683,000, the value of production was about $5,150 per capita.

During 2007, metallic minerals accounted for more than 97% of the total value of Alaska's nonfuel mineral production. Nearly all the metals value was the result of zinc, gold, lead, and silver production (in descending order of value). Zinc and lead production was mainly from Teck Cominco Alaska Inc.'s Red Dog Mine near Kotzebue in northwestern Alaska and the Greens Creek Mine (a joint venture of Kennecott Minerals Co. and Hecla Mining Co.) in southeastern Alaska southwest of Juneau; most of the State's gold was produced from Kinross Gold Corp.'s Fort Knox Mine near Fairbanks in interior Alaska, the Pogo Mine in interior Alaska near Delta, and the Greens Creek Mine. Nearly all other gold production was from placer gold resources. Minor copper production was credited to the State for the first time in a number of years.

Zinc production increased slightly (4%) from that of 2006, and its unit value decreased by 3%. Significant increases in the production of gold were the result of commissioning the Pogo Mine. Although lead production increased about 9% in 2007 from that of 2006, its value rose significantly owing to a strong increase in demand as world supplies remained tight. Silver production increased by 28%. In the industrial minerals sector, construction sand and gravel production increased by almost 11% and its total value increased by $2.1 million. A 26% decrease in crushed stone production resulted in a $4.4 million decrease in its value (table 1).

In 2007, Alaska continued to rank first in the production of zinc and silver, while producing more than 18 times and more than 3 times, respectively, the quantities of those metal mineral commodities than the next highest producing States. The State also remained second in the production of lead, third of 10 gold-producing States, and the producer of significant quantities of construction sand and gravel.

Production of peat was not reported to the USGS, partly because of reporting difficulties associated with the seasonal, intermittent nature of peat mining in the State. The Alaska Department of Natural Resources (ADNR), Division of Geological and Geophysical Surveys (DGGS), estimated peat production to be about 52,200 cubic meters, valued at about $1.09 million; this was an increase from 50,900 cubic meters produced in 2006, valued at about $1.06 million (Szumigala and Hughes, 2007, p. 40).

The DGGS in cooperation with the Alaska Department of Commerce, Community and Economic Development, Office of Economic Development and Minerals, provided the following narrative information[2]; the data, as provided, are based on DGGS surveys and estimates and may differ from USGS production figures as reported to and estimated by the USGS.

Exploration, Development, and Drilling Activities

Total mineral exploration expenditures during 2007 (including expenditures for coal and peat) were more than $329.1 million, 84% more than the $178.9 million spent in 2006. Nonfuel mineral exploration expenditures during 2007 were approximately $321.5 million, 82% more than the $176.5 million spent on nonfuel mineral exploration in 2006. Most of the exploration expenditures (32%) or $103 million were directed toward porphyry copper-gold deposits and intrusion-related gold deposits (27%) or $88 million, with approximately 19% ($62 million) spent on various gold-quartz vein deposits, (18%) or $59 million on polymetallic massive sulphide deposits, (1%) or $3 million on platinum-group metal ultramafic deposits, and (4%) or $14 million on other deposits, including coal. There were 33 projects that had exploration expenditures of at least $1 million, and an additional 52 projects cost $100,000 or more.

Exploration projects were conducted across the entire State, although nearly 55% or $180 million of expenditures was directed toward projects in southwestern Alaska. The leading exploration project in Alaska in 2007 was Northern Dynasty Minerals Ltd.'s Pebble project on the north side of Lake Iliamna in southwestern Alaska. The project consists of 1,331 State mining claims over copper-gold-molybdenum porphyry mineralization containing principally chalcopyrite, molybdenite, and pyrite. Two advanced exploration projects, Donlin and Pebble Creek, accounted for most of the exploration expenditures and drill footage in 2007. Northern Dynasty concentrated on drilling the Pebble East deposit and completed nearly 48,000 meters (m) of core drilling in 36 holes. NovaGold Resources Inc. reported results from 152,000 m of drilling at the Donlin Creek gold deposit, and Barrick Gold Corporation completed in excess of 70,100 m of drilling at Donlin in 2007.

Nonfuel mineral development expenditures were approximately $313.4 million in 2007, a nearly 35% decrease from the record $479.7 million spent in 2006. This decrease was a result of the completion of the Pogo project and the near completion of the Kensington project. Development continued at the Rock Creek project near Nome. Construction was completed

[1]The 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 2007 USGS mineral production data published in this chapter are those available as of March 2009. 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.

[2]Lisa A. Harbo, Development Specialist II, Alaska Department of Commerce, Community and Economic Development, Office of Economic Development and Minerals, authored the text of the State mineral industry information as derived from Szumigala and Hughes (2008).

at the Mystery Creek project at Nixon Fork, and operations were commissioned in the first quarter. Significant nonfuel mineral development expenditures were noted at Fort Knox Mine, Greens Creek Mine, Red Dog Mine, and the Kensington project. Total full-time equivalent employment was dedicated to nonfuel mineral development and was estimated to be about 502 in 2007 compared with nonfuel mineral development employment of 722 in 2006.

In the eastern interior region, total nonfuel mineral construction expenditures amounted to $49.8 million in 2007 compared with $241.9 million in 2006. This reduction of $192.1 million, or 79%, was primarily owing to the completion of construction and capitalization at the Pogo project. Capital expenditures at Pogo in 2007 were $17.7 million and included an upgrade of living quarters to accommodate added underground development contractor personnel and capitalization of operating losses. A third filter press was commissioned and modifications were made to the filtered tailings handling system to improve backfilling. At Fort Knox Mine, development expenditures were $30 million in 2007. Development work included stripping in phase 6, construction of the Walter Creek heap-leach facility, and construction of a SAG mill reject conveyor. An additional nine projects reported nonfuel mineral development activities in the eastern interior part of the State in 2007, with expenditures totaling $2.5 million. The most significant portion of this was spent by Freegold Ventures Ltd. at the Golden Summit project north of Fairbanks in test mining of the property. Other notable nonfuel development projects included placer and sand and gravel. The southeast region received the most development expenditures in 2007, totaling $123.1 million. Development construction continued at Kensington project, and ongoing development continued at Greens Creek Mine. Development expenditures at Kensington included construction of the mill and supporting surface facilities and underground development. Most of the development expenditure at Greens Creek was for development of ore. Limited development activity took place in the southwestern region in 2007. Three placer gold projects reported development expenditures of $870,000 spent in this region. No development expenditures were reported for the Alaska Peninsula region in 2007. In the northern region, total development expenditures were $41.4 million, all of which occurred at the Red Dog Mine. These projects included $18.6 million for tailings dams upgrading, $13.0 million on other sustaining capital projects, $8.4 million for additional flotation capacity, and $1.3 million on in-fill drilling at the Aqqaluk deposit. The Aqqaluk in-fill drilling totaled 6,300 m of core hole drilling.

Commodity Review

Industrial Minerals

Sand and Gravel, and Stone, Crushed.—Production of crushed stone decreased to 2 million metric tons (Mt) in 2007 from 2.2 Mt in 2006, an 8.3 % decrease. Sand and gravel production increased 1.07 Mt in 2007, an increase of 1.5 % compared with the 8.4 Mt produced in 2006. The data reflect some shortfall in reporting.

Metals

Gold.— Fairbanks Gold Mining operated the Fort Knox Mine in 2007. The company produced 10,527 kilograms (kg) (338,400 troy ounces) of gold during the year, compared with 10,369 kg (333,400 troy ounces) produced in 2006. Ore production was an average of 35,000 metric tons per day (t/d) from an average of 31,000 t/d in 2006. Total mined material for 2007 was 42 Mt, which included 22 Mt of stripped waste material. Employment at the Fort Knox Mine for 2007 averaged 399 persons. The Pogo Mine was in production phase during 2007, and approximately 650,000 t of ore was mined. Treatment of about 649,000 t of the mined material resulted in the recovery of 8,081 kg (260,000 troy ounces) of gold. This was somewhat below the planned production goal of 10,537 kg (340,000 troy ounces) owing to the construction and commissioning of the filter projects in the first quarter and poor equipment availability that affected online time and throughput rates. Hard-rock (lode) gold production in the State totaled about 20,935 kg (673,000 troy ounces). The increase in hard rock production was primarily owing to higher output at Pogo Mine and some production from Nixon Fork Mine. Placer gold production was 1,675 kg (54,000 troy ounces) a slight decrease from 1,878 kg (60,400 troy ounces) in 2006.

Lead, Silver, and Zinc.—The Red Dog Mine accounted for nearly 70% of the annual production value of Alaska's mineral industry in 2007. The total ore milled at the Red Dog Mine was 3.4 Mt. The ore grade for 2007 was 6.1% lead, 106 grams per metric ton silver, and 20.2% zinc. The project produced 575,000 t of zinc, 136,000 t of lead, and an estimated 361,000 kg (11.6 million troy ounces) of silver in 2007. The mine is 100% owned and operated by Teck Cominco Alaska Inc. under a development agreement with NANA Regional Corporation, Inc. (an Alaskan Native corporation) and is located in the DeLong Mountains of Alaska's Brooks Range, a remote site that lies approximately 144 kilometers (km) north of Kotzebue and 88 km from the Chukchi Sea. The Greens Creek Mine produced gold-, lead-, silver-, and zinc-bearing ore. In 2007, 664,000 t of ore was milled. Metal production from the milled ore totaled approximately 245,000 kg (7.9 million troy ounces) of silver, 2,115 kg (68,000 troy ounces) of gold, 50,800 t of zinc, and 17,000 t of lead.

Government Programs, Activities, Awards

The Alaska DGGS continued to be an active participant in the STATEMAP program. STATEMAP is a component of the congressionally mandated National Cooperative Geological 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. Geologists from the Minerals Resources Section of the Alaska Division of Geological and Geophysical Surveys (DGGS) mapped and sampled 490 square kilometers (km^2) of the northeastern part of the Fairbanks mining district. A series of 1:50,000-scale geologic maps were expected to be available in late 2008. DGGS conducted fieldwork along the proposed gas pipeline corridor between Delta Junction and Dot Lake along the Alaska Highway during the summers of 2006 and 2007. Surficial and bedrock mapping were completed at a scale of 1:63,360. The State of Alaska, through DGGS, funded and acquired airborne magnetic and electromagnetic geophysical surveys for 466 km^2 of the 1,800-km^2 Styx River survey area in the northeastern Lime Hills and northwestern Tyonek quadrangles. The remainder of the data were to be acquired in early 2008 and released in the summer 2008. DGGS released airborne magnetic and electromagnetic geophysical survey data for 1,600 km^2 of the eastern Bonnifield District along the northern flank of the Alaska Range. DGGS also acquired airborne magnetic and electromagnetic geophysical data for a 647-km^2 area of the western Fortymile mining district. The survey, funded by the U.S. Bureau of Land Management (BLM), covers part of the Eagle and Tanacross quadrangles and focuses on Federal and Native lands. Usibelli Coal Mine Inc. was named exporter of the year by the governor for its work shipping coal to the Republic of Korea and Chile. In January, Alaska Industrial Development & Export Authority signed a 7-year agreement with Sherwood Copper Corp. to use the Skagway ore terminal for copper-gold ore concentrates from Sherwood's Minto Mine in the Yukon Territory, Canada. The Skagway ore terminal began receiving truckloads of high-grade copper-gold concentrates in July.

The State established clear ownership of two historic RS 2477 trails in northern Alaska under a settlement reached with the Federal Government and Doyon Ltd. The 105-km Coldfoot-Chandalar Lake trail and the 137-km Caro-to-Coldfoot trail are among many access routes that Alaska claims under RS 2477, a Federal law by which the Federal Government granted rights-of-way across Federal lands not otherwise reserved for public use.

The Ninth U.S. Circuit Court of Appeals ruled that the Kensington project wastewater discharge permit issued by the U.S. Army Corps of Engineers violated the Federal Clean Water Act. The court found that the Corps of Engineers did not have the jurisdiction to grant the permit and that authority rested with the U.S. Environmental Protection Agency. The appeals court sent the case to a lower court to vacate two permits which covered the placement of tailings and construction of a marine terminal that would service the mine. The case would likely be petitioned to the U.S. Supreme Court.

The Juneau John Rishel Mineral Information Center on Mayflower Island in Douglas, AK, closed to the public in July. The U.S. Coast Guard moved into the building. The Juneau Center housed a specialized mining and geology library with a collection of more than 20,000 mineral-related items, including books, journals, maps, and State and Federal Government documents. Mining artifacts were transferred to the Juneau-Douglas City Museum and will be identified by a commemorative plaque recognizing the John Rishel collection. The world-class mineral collection was transferred to the University of Alaska Anchorage, one of the only facilities in the State with room to display the complete collection. Records and books were transferred to the Alaska Resources Library and Information Services in Anchorage and the DGGS in Fairbanks. Effort was made to keep the information specific to southwestern Alaska available in Juneau libraries. The information will remain accessible to the public.

The Jack Wade Dredge at mile post 86 of the Taylor Highway in eastern Alaska was dismantled by a contractor for the BLM because of safety concerns. The dredge, a popular tourist photo shop, and one of the few indications of the rich placer mining history of the Fortymile area, had deteriorated during the years since it was abandoned in 1941. Several large pieces of the dredge, such as the boiler, gearing and winching machinery, trammel, hand-levels, and buckets, were saved and would be put on display with some interpretive signs near the Chicken post office to highlight the historical significance of the dredge and placer gold mining in the region. The BLM announced results from the Bay Area Resource Management Plan-Environmental Impact Statement update review. The BLM planned to lift mining restrictions on roughly 4,000 km^2 of land in the Bristol Bay region. Mining restrictions have been in place for more than 30 years because of the land selection process imposed by the 1971 Alaska Native Claims Settlement Act. The University of Alaska's Mining and Petroleum Training Service (MAPTS) opened a new training facility at Kenai Peninsula College in Soldotna. MAPTS was established 28 years ago and has the largest enrollment of any such program in North America. MAPTS has trained more than 50,000 people in mining technology, process technology, industrial process instrumentation, and mechanical technology.

Reference Cited

Szumigala, D.J., and Hughes, R.A., 2008, Alaska's mineral industry 2007: Fairbanks, Alaska, Alaska Division of Geological & Geophysical Surveys Special Report 62, 105 p. (Also available at http://www.dggs.alaska.gov/pubs/pubs?reqtype=citation&ID=17841.)

TABLE 1

NONFUEL RAW MINERAL PRODUCTION IN ALASKA[1, 2]

(Thousand metric tons and thousand dollars)

Mineral	2005		2006		2007	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones	NA	12	NA	13	NA	13
Sand and gravel, construction	15,100	80,600	9,140 r	53,900 r	10,000	56,000
Stone, crushed	2,430	16,000	2,180 r	22,400 r	1,620	18,000
Combined values of cadmium (byproduct from zinc concentrates), gold, lead, silver, zinc	XX	1,410,000	XX	2,940,000 r	XX	3,444,840
Total	XX	1,500,000	XX	3,020,000 r	XX	3,518,934

rRevised. 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 no more than three significant digits; may not add to totals shown.

TABLE 2

ALASKA: CRUSHED STONE SOLD OR USED, BY TYPE[1]

Type	2006			2007		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	1	6	$102	1	6	$43
Granite	4	136	1,400	6	244	2,670
Traprock	1	53	525	1	129	1,440
Miscellaneous stone	13 r	1,980 r	20,400 r	16	1,240	13,900
Total	XX	2,180 r	22,400 r	XX	1,620	18,000

rRevised. XX Not applicable.

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

TABLE 3

ALASKA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2007, BY USE[1]

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Riprap and jetty stone	61	1,010
Other coarse aggregate	10	98
Coarse aggregate, graded:		
Concrete aggregate, coarse	W	W
Railroad ballast	W	W
Other graded coarse aggregate	1	10
Fine aggregate (-⅜ inch), other	26	340
Coarse and fine aggregates:		
Graded road base or subbase	W	W
Unpaved road surfacing	W	W
Terrazzo and exposed aggregate	W	W
Crusher run or fill or waste	W	W
Other coarse and fine aggregates	72	480
Unspecified, estimated[2]	1,300	14,000
Total	1,620	18,000

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

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

[2]Estimated production without a breakdown by end use.

TABLE 4
ALASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2007,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products[2]	1,150	$8,290	$7.22
Asphaltic concrete aggregates and other bituminous mixtures	249	2,510	10.06
Road base and coverings[3]	1,410	9,510	6.76
Fill	792	3,320	4.20
Other miscellaneous uses[4]	48	471	9.78
Unspecified:[5]			
Reported	844	2,400	2.84
Estimated	5,550	29,500	5.32
Total or average	10,000	56,000	5.58

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

[2]Includes plaster and gunite sands.

[3]Includes road and other stabilization (cement).

[4]Includes filtration and snow and ice control.

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