THE MINERAL INDUSTRY OF WYOMING

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

In 2000 the estimated value[1] of nonfuel mineral production for Wyoming was $922 million, based upon preliminary U.S. Geological Survey (USGS) data. This was a 7.8% decrease from that of 1999,[2] and followed a 6.5% decrease from 1998 to 1999. The State ranked 16th (14th in 1999) among the 50 States in total nonfuel mineral production value, of which Wyoming accounted for more than 2% of the U.S. total.

Wyoming's leading nonfuel mineral, by value, was soda ash, followed by bentonite, Grade-A helium, and portland cement. The four combined accounted for about 94% of the State's total raw nonfuel mineral production value. In 2000, a significant decrease in the value of soda ash was, in part, balanced by an increase in portland cement. All other nonfuel minerals had small to no changes in production and value and had little effect on the overall net result in value. In 1999, a more than $50 million decrease in the value of soda ash plus smaller yet significant decreases in the values of portland cement, crushed stone, and lime (descending order of change) represented most of the State's decrease in value (table 1).

Based upon USGS estimates of the quantities of minerals produced in the 50 States during 2000, Wyoming remained first in soda ash and bentonite and second in Grade-A helium. Soda ash (sodium carbonate) is an inorganic chemical used extensively in the manufacture of glass, paper, soap and detergents, and textiles, and as sodium bicarbonate in food products. The United States is the world's largest producer of soda ash. Wyoming, one of only three producing States, is home to the world's largest known natural deposit of trona. Trona is the principal ore from which soda ash is produced. California produces a significantly smaller quantity of natural soda ash. In the past several years Wyoming has had considerable exploration activity for metals but has not had significant metal production since iron ore mining ceased in April 1984.

The Wyoming State Geological Survey (WSGS) provided the following narrative information.[3] Industrial minerals produced in 2000 included the following: aggregate (construction and decorative), bentonite, common clay, dolomite, feldspar, gypsum, helium, leonardite, limestone, marble, scoria, siliceous shale, sodium sulfate, stone (decorative and dimension), sulfur (recovered), and trona. Other mineral commodities manufactured included lime from limestone quarried in Montana and expanded perlite from perlite mined in Colorado. Cement is manufactured from limestone, gypsum, siliceous shale, and other additives at one plant in Laramie.

Bentonite production remained at near record levels. Wyo-Ben Inc. reopened the Lucerne mill in Hot Springs County. This mill had been closed since the early 1990s. There are now fifteen bentonite mills operating in Wyoming.

New highway construction projects resulted in an increase in construction aggregate production in 2000. Some large quarries were opened to quarry construction aggregate for stockpiles near active and future highway projects.

Wyoming's largest aggregate-producing quarry was located at Granite Canon east of Cheyenne. This quarry produced aggregate for railroad ballast and other uses from quartzofeldspathic gneiss. Martin Marietta Materials Inc. bought this operation from Meridian Materials in late 2000.

The production of cut and polished pieces of Wyoming Raven (black granite) and Mirage (gneiss) continued at Raven Quarries Llc. quarry in northern Albany County. Raven constructed a small processing facility at the quarry site. A custom fabricating plant opened in Cheyenne, and operated full time all year. Another custom fabricating plant is operating in Casper. At year's end, six companies were in various stages of planning, acquiring leases, or permitting dimensional stone quarries and fabricating plants in Wyoming.

Decorative stone, including fieldstone, moss rock, flagstone, and landscape rock was quarried or harvested (removed from the surface) at several localities in Wyoming. Some of these stones were harvested or quarried by private landowners from their own properties. Decorative aggregate was produced in several localities in Wyoming in 2000. Guernsey Stone Inc., a division of Peter Kiewit, Inc., produced several colors of decorative aggregate primarily for landscape rock. Imerys Marble Inc., formerly Georgia Marble Co., produced white marble aggregate and fines for a variety of uses, including landscape rock, roofing granules, and pigment. Some of the product was sold to large building supply retailers. Like fieldstone, most of Wyoming's production was shipped to Colorado.

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[1]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 2000 USGS mineral production data published in this chapter are preliminary estimates as of July 2001 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. A telephone listing of the specialists may be retrieved over the Internet at URL http://minerals.usgs.gov/minerals/contacts/comdir.html, by using MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset (request Document #1000 for a telephone listing of all mineral commodity specialists), or by calling USGS information at (703) 648-4000 for the specialist's name and number. All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL http://minerals.usgs.gov/minerals; facsimile copies may be obtained from MINES FaxBack.

[2]Values, percentage calculations, and rankings for 1999 may vary from the Minerals Yearbook, Area Reports: Domestic 1999, Volume II, owing to the revision of preliminary 1999 to final 1999 data. Data for 2000 are preliminary and are expected to change; related rankings may also change.

[3]Ray E. Harris, Staff Geologist-Industrial Minerals and Uranium, and W. Daniel Hausel, Senior Economic Geologist-Metals and Precious Stones, both of the Wyoming State Geological Survey, coauthored the text of mineral industry information submitted by the agency.

Gypsum deposits on the Wind River Indian Reservation continue to be evaluated by the Shoshone and Arapaho Tribes and the U.S. Bureau of Indian Affairs. Wyoming's production of wallboard by two companies in the Bighorn Basin continued at full plant capacity in 2000. Mountain Cement Co. quarried a small amount of gypsum south of Laramie for use as a retardant in cement.

About 34 million cubic meters of Grade-A helium was produced by one plant in Wyoming in 2000. Helium was produced as a byproduct of natural gas refining.

Basin Electric Power Cooperative obtained limestone for emissions control at its Laramie River Station powerplant near Wheatland from Colorado Lien's Hartville Quarry. In previous years, the source had been the Bass Quarry, 24 kilometers (km) farther from the powerplant than the Hartville Quarry. Mountain Cement Co. opened a new quarry south of the previous source of chemical-grade limestone. It continued to reclaim previous quarry sites.

Siliceous shale was quarried south of Laramie by Mountain Cement for use as an additive in certain grades of cement. Silica is a strengthener in cement.

The production of trona ore continued in 2000 at about the same rate as in 1999, at about 16 million metric tons per year. Four companies (FMC Wyoming Corp., General Chemical Soda Ash Partners Inc., OCI Chemical Corp., and Solvay Minerals Inc.) produce more than 90% of the soda ash manufactured from trona in the United States at five plants near five underground mines in Wyoming. There was also some recovery of trona from mine water at one locality.

Exploration activity for claimable minerals was sluggish throughout the year. Most U.S.-based companies are searching outside the United States for mineral resources, while a few companies are initiating new projects in the United States. High prices for platinum-group metals (PGM) stimulated the search for these rare metals because Wyoming is considered to have some of the best prospects for PGM resources in North America. The WSGS provided companies with up-to-date information of PGM targets in the State on its web site at http://www.wsgsweb.uwyo.edu/metals/metals.htm. Some of the better potential targets lie within the Wyoming platinum-palladium-nickel province. This province forms a belt of supracrustal rocks of Precambrian age in southeastern Wyoming, and approximately parallels the Cheyenne Belt (also referred to as the Mullen Creek-Nash Fork shear zone).

The rush for PGM continued throughout 2000, with dozens of new mining claims filed with the U.S. Bureau of Land Management. Several companies initiated projects in Wyoming to search for these precious metals, with as many as 2,000 mining claims being staked in the Lake Owen, Mullen Creek, Centennial Ridge, Puzzler Hill, and other areas within and near the Medicine Bow National Forest.

Exploration activity has included stream sediment sampling, soil and rock sampling, and some airborne geophysical surveys. Some of the companies with interest in the region include Cowboy Exploration, Donnybrook Resources, Encampment Resources, General Minerals, Trend Mining Co., and Ursa Major Minerals Inc., as well as some consultants and prospectors.

Exploration and prospecting activity for diamond was at a low level during 2000. Even so, research by the WSGS indicates the Wyoming craton has been intruded by major swarms of kimberlite, lamproite, and lamprophyre. More than 300 kimberlitic indicator mineral anomalies were identified by the WSGS in the Laramie, Seminoe, and Medicine Bow Mountains of southeastern Wyoming. Maps of the anomalies were placed on the WSGS's web site.

Very little activity was reported for gold in the State, primarily due to low gold prices. Prospectors and hobbyists reported finding gold and gold nuggets at several locations in the State, and much of the activity centered on the South Pass greenstone belt. Company activity for gold was minor.

The WSGS obtained a grant from the USGS to initiate mapping on a regional scale of the Rattlesnake Hills 1:100,000 quadrangle. This quadrangle covers a major portion of the Granite Mountains in central Wyoming. The Granite Mountains lie in the core of the Wyoming craton, and are known for gold, gemstones, and uranium mineralization. Mapping will begin in the fall of 2001.

The WSGS continued to investigate the iolite-gneiss deposit discovered by the WSGS in 1995 (Hausel and Sutherland, 2000). Based on the discovery and available information, a small company recently filed claims on the mineral occurrence.

Reference Cited

Hausel, W.D., and Sutherland, W.M., 2000, Gemstones and other unique minerals and rocks of Wyoming—A field guide for collectors: Wyoming State Geological Survey Bulletin 71, 268 p.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral		1998		1999		2000 p/	
		Quantity	Value	Quantity	Value	Quantity	Value
Clays:							
Bentonite		3,150	145,000	3,370	146,000	3,380	146,000
Common		W	W	W	W	34	W
Gemstones		NA	14	NA	12	NA	12
Sand and gravel, construction		4,770	18,100	4,410	17,200	4,400	18,000
Stone, crushed		5,580	31,600	6,970	27,600	7,000	28,400
Zeolites	metric tons	(3/)	NA	--	--	--	--
Combined values of cement (portland), gypsum (crude), helium (Grade-A), lime, soda ash, and values indicated by symbol W		XX	879,000	XX	814,000	XX	730,000
Total		XX	1,070,000	XX	1,000,000	XX	922,000

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined values" data. XX Not applicable. -- Zero.

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/ Withheld to avoid disclosing company proprietary data.

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

Kind	1998				1999			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	9 r/	889 r/	$3,770 r/	$4.24 r/	7	1,530	$5,790	$3.78
Dolomite	1	W	W	W	1	W	W	W
Granite	2	W	W	W	2	W	W	W
Marble	1	W	W	W	1	W	W	W
Quartzite	1	W	W	W	1	W	W	W
Volcanic cinder and scoria	1	W	W	W	1	W	W	W
Miscellaneous stone	2 r/	86 r/	473 r/	6.00 r/	2	280	1,550	5.52
Total or average	XX	5,580	31,600	5.66	XX	6,970	27,600	3.96

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

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

TABLE 3
WYOMING: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 1999, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch), riprap and jetty stone	48	$316	$6.58
Coarse aggregate, graded:			
Concrete aggregate, coarse	297	1,280	4.30
Bituminous aggregate, coarse	W	W	W
Bituminous surface-treatment aggregate	W	W	W
Railroad ballast	W	W	W
Other graded coarse aggregate	3,220	13,500	4.20
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	W
Stone sand, bituminous mix or seal	W	W	W
Screening, undesignated	W	W	W
Other fine aggregate	395	1,310	3.32
Coarse and fine aggregates:			
Graded road base or subbase	1,540	5,050	3.27
Terrazzo and exposed aggregate	W	W	W
Other coarse and fine aggregates	215	1,110	5.17
Other construction materials	(3/)	(3/)	(3/)
Chemical and metallurgical, cement manufacture	(3/)	(3/)	(3/)
Unspecified: 4/			
Reported	(3/)	(3/)	(3/)
Estimated	210	750	3.59
Total or average	6,970	27,600	3.96

W Withheld to avoid disclosing company proprietary data; included with "Other."
1/ Data are rounded to no more than three significant digits; may not add to totals shown.
2/ Includes dolomite, granite, limestone, marble, miscellaneous stone, quartzite, and volcanic cinder and scoria.
3/ Withheld to avoid disclosing company proprietary data; included in "Total."
4/ Reported and estimated production without a breakdown by end use.

TABLE 4
WYOMING: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1999,
BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1 1/2 inch) 2/	W	W	(3/)	(3/)	--	--
Coarse aggregate, graded 4/	--	--	3,520	14,800	--	--
Fine aggregate (-3/8 inch) 5/	--	--	395	1,310	--	--
Coarse and fine aggregate 6/	W	W	(3/)	(3/)	--	--
Other construction materials	--	--	(3/)	(3/)	--	--
Chemical and metallurgical 7/	--	--	(3/)	(3/)	--	--
Unspecified: 8/						
Reported	--	--	(3/)	(3/)	W	W
Estimated	--	--	210	750	--	--
Total	W	W	6,500	25,300	W	W

W Withheld to avoid disclosing company proprietary data. -- Zero.
1/ Data are rounded to no more than three significant digits; may not add to totals shown.
2/ Includes riprap and jetty stone.
3/ Withheld to avoid disclosing company proprietary data; included in "Total."
4/ Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregate.
5/ Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregate.
6/ Includes graded road base or subbase, terrazzo and exposed aggregate, and other coarse and fine aggregates.
7/ Includes cement manufacture.
8/ Reported and estimated production without a breakdown by end use.

TABLE 5
WYOMING: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	584	$2,760	$4.73
Concrete products (blocks, bricks, pipe, decorative, etc.) 2/	19	75	3.95
Asphaltic concrete aggregates and other bituminous mixtures	289	1,970	6.82
Road base and coverings	1,080	4,090	3.79
Fill	125	329	2.63
Snow and ice control	9	41	4.56
Other miscellaneous uses	9	86	9.56
Unspecified: 3/			
Reported	839	2,580	3.08
Estimated	1,500	5,300	3.53
Total or average	4,410	17,200	3.90

1/ Data are rounded to no more than three significant digits; may not add to totals shown.
2/ Includes plaster and gunite sands.
3/ Reported and estimated production without a breakdown by end use.

TABLE 6
WYOMING: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,
BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

	District 1		District 2		Unspecified districts	
Use	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	266	1,410	318	1,360	--	--
Concrete products (blocks, bricks, pipe, decorative, etc.) 2/	W	W	W	W	--	--
Asphaltic concrete aggregates and other bituminous mixtures	778	4,270	593	1,780	--	--
Fill	W	W	W	W	--	--
Other miscellaneous uses 3/	98	376	64	155	--	--
Unspecified: 4/						
Reported	403	1,860	--	--	436	721
Estimated	400	1,200	1,100	4,100	--	--
Total	1,940	9,130	2,040	7,390	436	721

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.
1/ Data are rounded to no more than three significant digits; may not add to totals shown.
2/ Includes plaster and gunite sands.
3/ Includes snow and ice control.
4/ Reported and estimated production without a breakdown by end use.