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 2000, the estimated value[1] of nonfuel mineral production for Idaho was $399 million, based upon preliminary U.S. Geological Survey (USGS) data. This was a 1.7% decrease from that of 1999[2] and followed a 7.5% decrease from 1998 to 1999. The State remained 33d in rank among the 50 States in total nonfuel mineral production value, of which Idaho accounted for 1% of the U.S. total.

Phosphate rock, silver, construction sand and gravel, molybdenum, and lead were, by value, Idaho's leading nonfuel minerals. In 2000, molybdenum concentrates and construction sand and gravel values (listed in descending order of change) increased by about $5 million each and those of portland cement and zinc, about $2 million each. Smaller increases also occurred in copper and industrial garnet. But decreased values of more than $15 million in gold, about $2 million in phosphate rock, and smaller yet significant decreases in industrial sand and gravel, lead, and crushed stone offset these gains, resulting in a small net decrease in value for the year. All other changes were slight and had little effect on the overall total value. In 1999, increases of about $11 million in phosphate rock and around $3 million each in portland cement and industrial sand and gravel were more than offset by decreases in molybdenum (down more than $17 million), vanadium ore, and gold (these three decreases totaling more than $30 million), plus smaller yet significant decreases in construction sand and gravel, silver, lead, lime, and industrial garnet (table 1).

Based upon USGS estimates of the quantities produced in the United States during 2000, Idaho remained the only State to produce antimony ore, second in phosphate rock, third in silver and lead (descending order of value), fourth in molybdenum and pumice, sixth in zinc and feldspar, seventh in perlite, and eighth in gemstones. The State was second of 2 industrial garnet-producing States and decreased to ninth from eighth of 11 gold-producing States. Additionally, the State was a significant producer of construction and industrial sand and gravel and dimension stone.

The Idaho Geological Survey[3] (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. Low metal prices took their toll on Idaho's mining industry in 2000, even as high demand for industrial minerals and construction materials contributed to increased exploration activity for several commodities. According to statistics compiled by the Idaho Department of Labor, employment in metal mining declined during 2000 from 1,300 in January to 1,200 persons in December 2000. Total employment in mining was listed as 2,452 jobs at the end of the year. Especially noteworthy in 2000 was the closure of the State's only remaining large gold mine, Meridian Gold Co.'s Beartrack Mine in Lemhi County, and the bankruptcy of the Sunshine Mining Co., owners of the legendary Sunshine Mine in Shoshone County. The Sunshine Mine has produced more than 10,900 metric tons (t) since its discovery in 1884, making it one of the world's largest silver mines. Three underground mines (the Sunshine, the Lucky Friday, and the Galena) continued to operate in the Coeur d'Alene District, but none made any profits. Total silver production from the three mines in the Silver Valley in 2000 was 401 t.

A chapter in Idaho and Coeur d'Alene District mining history was nearing the final page when Sunshine filed for Chapter 11 bankruptcy and reorganization on August 23, 2000. The company mined the West Chance vein at the Sunshine Mine through the year, but financial constraints had already forced it to eliminate exploration, and reserves at the mine were dwindling. Production in 2000 was 121 t of silver, a drop from the 162 t produced in 1999. The firm's 260 employees were concerned about possible layoffs.

Hecla Mining Co.'s Lucky Friday Mine, which produces from both the Lucky Friday and Gold Hunter veins, had its second highest production year ever, with more than 156 t of silver mined. But with low lead and low silver prices, the mine and company lost money.

Conditions at Silver Valley Resources Corp.'s Galena Mine were somewhat better, especially after shaft repairs at the first of the year. Mining costs were lowered, and production was ramped up to a little more than 124 t, as part of the accelerated development program implemented by Coeur d'Alene Mines Corp. after it took over full ownership of the mine in 1999 by purchasing ASARCO Incorporated's share of the company. Most importantly, a highly successful exploration and development drilling program increased reserves and led to exciting new drill targets for next year particularly in the West Argentine portion of the property. One diamond drill hole

[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]Virginia S. Gillerman, Research Economic Geologist, authored the text of the Idaho mineral industry information submitted by the Idaho Geological Survey.

intersected a 3-meter section of the 294 vein that graded more than 789 grams per metric ton silver and 1.4% copper. The same hole encountered a second mineralized intercept in the Polaris Fault zone, well outside of previously known mineralization. Coeur d'Alene Mines Corp. spent more than $6 million on the development activity and improvements at the Galena.

Declining gold prices and depleted reserves forced the closure of Meridian Gold Co.'s Beartrack Mine in Lemhi County. Meridian completed mining and crushing in March 2000 at its heap-leach open pit gold mine, though leaching and reclamation work will continue. In 2000, the mine produced 2,247 kilograms (kg) of gold versus the record production of 4,151 kg in 1999. Since opening in 1995, the mine has poured more than 18 t of gold. Approximately 100 people lost their jobs in the closure. The North Pit was backfilled and capped, and the Mason-Dixon pit was also reclaimed during the year. The mine area served as a critical fire break to help contain raging wildfires during the summer.

Low prices forced layoffs and production cuts at Thompson Creek Mining Co.'s large open pit molybdenum mine in Custer County. Slightly more than 100 persons were still employed at yearend. Some delineation drilling was completed behind the high wall during the year, and in September, the Secretary of the Interior signed mineral patents covering 1,000 hectares at the mine and mill. The company also received a long-awaited decision on its Supplemental Environmental Impact Statement, allowing it to operate the pyrite reduction plant to provide clean sand for construction of the tailings embankment. Sales from its special lubricant-grade molybdenum plant have helped keep the mine going.

New mine development activities were focused primarily in the industrial mineral sector. The phosphate industry of southeastern Idaho remained as the largest mineral industry in the State with the four open pit mines extracting more than 5.4 million metric tons (Mt) of ore. The ore is processed at two fertilizer plants and two elemental phosphorus plants. All four major companies were working on permits and development activities for new mines or expansions of existing operations. J.R. Simplot Co. increased production to approximately 3 Mt of phosphate ore from its Smoky Canyon Mine and worked on a Supplemental Environmental Impact Statement to expand northwards to the B and C panels. The company was also high bidder for new leases in the Manning Creek and Dairy Syncline areas. Monsanto Co. (formerly Solutia Inc.) shipped approximately 1 million dry metric tons from the Enoch Valley Mine and started prestripping from its South Rasmussen deposit. Monsanto also added a new shipping facility to its elemental phosphorus plant near Soda Springs. Kerr-McGee Corp. shut down a vanadium plant and a new small fertilizer plant because of low market prices at Soda Springs.

FMC Corp.'s phosphate operations officially changed its name to Astaris LLC in April 2000. Astaris is a joint venture between FMC and Solutia. Astaris operated the Dry Valley Mine and received permits to expand to the C and D pit areas after revising the Environmental Impact Statement to better prevent selenium releases from waste rock. Astaris also announced in March that it would spend an additional $68 million on air quality controls at its elemental phosphorus plant in Pocatello, but at yearend, the company laid off 21 workers and shut down 2 of the 4 electric furnaces at its plant. The shutdowns, which were due partly to increased power costs, are probably permanent. Agrium Inc. and contractor, the Washington Group, shipped approximately 1.4 Mt of phosphate ore from the central Rasmussen Mine. Agrium was also doing delineation drilling on the North Rasmussen tract and formally submitted a mine plan that was uniquely designed to have no external waste dumps. Agrium and Astaris were joint-venture partners in a major new construction project during the year—a $100 million plus purified phosphoric acid plant under construction at Conda. The plant uses a solvent extraction technology to further purify some of the phosphoric acid produced at Agrium's acid fertilizer plant.

New development activity was also underway for Oakley Valley Stone Inc., the durable micaceous quartzite dimension stone quarried south of Oakley in south-central Idaho. A local resident started Diamondfield Quartzite to reactivate an old quarry at Warm Springs under an agreement with Interstate Rock Products, Inc. of Washington. American Stone & Building Inc., a Utah-based company, worked the Fish Creek quarry. Existing producers were Oakley Valley Stone Inc. and Northern Stone Supply Inc.

Many industrial mineral operations had a good year. Business was booming for Emerald Creek Garnet Co. in Benewah County, one of the Nation's leading suppliers of industrial garnets. The company was also working on permits for a new lease in the St. Maries River flood plain. Hess Pumice Products, Inc. had steady sales of its ultrapure, ultrafine polishing powder, which is exported to the Pacific Rim. Hess also operated the Idaho Minerals Inc.'s perlite expander plant, which it purchased in 1999 to make horticultural and insulation products. Another pumice producer was Mountain West Products LLC, formerly Mountain West Colorado Aggregate, which was acquired by a new owner. The Rexburg-based company mines gold, red and black pumice, and scoria for landscaping. Metal exploration was especially limited by low metal prices and regulatory uncertainty about the proposed new roadless policy on National Forest lands and the new U.S. Bureau of Land Management (BLM) 3809 rules and regulations that address mining access, mining management, and bond issues related to mining on Idaho's BLM land. Finalization of these rules was anticipated by the autumn of 2001.

Formation Capital Corp. had the most significant metal exploration project in the State in 2000. The company continued work on its Idaho Cobalt Project, formerly the Sunshine Project, southwest of the town of Salmon in the Blackbird Mining District of Lemhi County. The Idaho Cobalt Belt is one of only two high-grade reserves of this strategic metal in the United States. The company has 137 unpatented claims on which it has been exploring since 1993. Most of the work in 2000 involved offsite feasibility studies and permitting activities, though the company did drill eight metallurgical test holes on its Ram deposit. Drilling finished just before the remote area was torched by the massive Clear Creek fire that swept the region and forced many to evacuate. Feasibility studies by Mine Development Associates, based on the more than 100 diamond drill holes, have indicated favorable economics for a small underground mine. Formation is looking at a hydrometallurgical refinery for use on the project. The proven and probable reserve is listed at 1.55 Mt of 0.695% cobalt, 0.54% copper, and a gold credit, with substantial exploration potential at depth, along strike, and districtwide.

Idaho Consolidated Metals Corp. (ICMC) owned four gold properties in the Orogrande and Elk City Mining Districts, namely the Buffalo Gulch, Deadwood, Dixie, and Petsite/Friday and properties. In September, ICMC announced that for $70,000 it had acquired Kinross Gold Corp.'s 70% interest in Petsite, which has a total resource of 16.5 t of gold. Kinross and Cyprus Amax Minerals Co. had done substantial drilling on the Petsite property along the Orogrande Shear Zone in Idaho County.

At Warren in Idaho County, the owner of CSC Mining Co. sold his interest in the high-grade Rescue gold mine and mill to Barramundi Gold USA, a subsidiary of Barramundi Gold Ltd., a Canadian firm. The small underground mine has ore shoots that average about 22 grams per metric ton gold in a quartz vein cutting granodiorite.

At Mackay in Butte County, Sultana Resources Corp., a local group, acquired claims at the historic Empire Mine and announced plans to start a copper leaching operation. The copper skarn had most recently been explored by Cambior Inc., the company that had drilled out a significant copper-zinc resource. Sultana hoped to draft plans for a solvent extraction plant and mine.

There was renewed interest in exploration for industrial minerals, in addition to the Oakley stone quarry development. U.S. Antimony Corp., a Montana-based company, switched from gold to industrial minerals. Its subsidiary, Bear River Zeolite, was exploring and developing a large potassium-rich clinoptilolite deposit near Preston. The zeolite is hosted in old lake beds.

Alchemy Ventures Ltd., a Canadian firm, was exploring the Helmar-Bovill clay deposits of Latah County in northern Idaho. Both kaolinite and halloysite are found over an extensive area that has had past production for the fire brick and refractory markets. Alchemy did extensive marketing studies and testing, including drilling 13 core holes. A larger program was planned for 2001.

Several closed precious-metal mines were in the reclamation phase. These included the Beartrack Mine, U.S. Antimony Corp.'s Yellowjacket Mine in Lemhi County, Pegasus Gold Corp.'s Black Pine Mine in Cassia County, Kinross Gold Corp.'s mothballed DeLamar and Stone Cabin Mines in Owyhee County, and Hecla Mining Co.'s Grouse Creek Mine in Custer County. At Grouse Creek, the company signed a voluntary agreement with the U.S. Forest Service and the U.S. Environmental Protection Agency in October to dewater and to detoxify the tailings pond and to construct a water-treatment plant. The impoundment has had low-level cyanide leaks.

At the Stibnite Mine, the question was, who should pay for the $5 million cleanup of the historic Bradley Mill tailings? Mobil Oil Corp. had bankrolled the award-winning cleanup because of its purchase of Canadian Superior Energy Inc., the company that started an open pit gold mine there in the 1980s. But Mobil's attorneys forced the Federal Government to acknowledge the vital role the U.S. Government had had in mining and processing tungsten ore at Stibnite during World War II. Mobil will be partially reimbursed by the Government for cleanup costs.

Environmental cleanup continued at several areas in the Coeur d'Alene District of northern Idaho, though work at the Bunker Hill Superfund site was nearing completion. Legal and political uncertainty remained over possible expansion of the Superfund site and resolution of the Natural Resources Damage lawsuit of the Federal Government and tribes against the mining companies.

Unimin Corp. operates a silica sand pit and plant near Emmett in southwestern Idaho. The Emmett employees were nationally recognized by the Wildlife Habitat Council for developing a special management plan for the endangered Aase's onion plant and for building bird nesting platforms.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral		1998		1999		2000 p/	
		Quantity	Value	Quantity	Value	Quantity	Value
Antimony	metric tons	242	W	449	W	137	W
Gemstones		NA	321	NA	368	NA	386
Pumice and pumicite	metric tons	73,400	686	98,600	917	98,200	913
Sand and gravel:							
Construction		16,600	52,400	15,500	48,200	16,500	53,000
Industrial		710	8,470	711	11,200	652	10,200
Silver 3/	metric tons	447	73,200	416	70,100	415	70,000
Stone:							
Crushed		4,180	18,400	4,220	19,000	4,000	18,400
Dimension	metric tons	15,900	4,710	39,300	5,510	39,300	5,510
Combined values of cement (portland), copper, feldspar, garnet (industrial), gold, lead, lime, molybdenum concentrates, perlite [crude, (1999-2000)], phosphate rock, vanadium ore, zinc, and values indicated by symbol W		XX	281,000	XX	250,000	XX	241,000
Total		XX	439,000	XX	406,000	XX	399,000

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.

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

Kind	1998 Number of quarries	1998 Quantity (thousand metric tons)	1998 Value (thousands)	1998 Unit value	1999 Number of quarries	1999 Quantity (thousand metric tons)	1999 Value (thousands)	1999 Unit value
Limestone	7	1,040	$4,030	$3.88	8	1,020	$4,130	$4.06
Granite	4	256	911	3.56	6	156	563	3.61
Quartzite	8	466	2,050	4.41	6	574	4,090	7.12
Shell	1	23	77	3.35	1	12	87	7.25
Traprock	25	1,900	8,960	4.72	22	1,830	7,620	4.17
Miscellaneous stone	11	497	2,320	4.66	14	635	2,480	3.90
Total or average	XX	4,180	18,400	4.39	XX	4,220	19,000	4.49

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 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	121	$609	$5.03
Filter stone	W	W	6.25
Other coarse aggregate	88	347	3.94
Total or average	209	956	4.57
Coarse aggregate, graded:			
Concrete aggregate, coarse	(3/)	(3/)	5.05
Bituminous aggregate, coarse	61	274	4.49
Bituminous surface-treatment aggregate	39	189	4.85
Fine aggregate (-3/8 inch), screening, undesignated	23	75	3.26
Coarse and fine aggregates:			
Graded road base or subbase	371	1,540	4.14
Unpaved road surfacing	126	555	4.40
Crusher run or fill or waste	54	290	5.37
Other coarse and fine aggregates	235	1,160	4.95
Total or average	786	3,550	4.51
Agricultural:			
Agricultural limestone	18	60	3.33
Poultry grit and mineral food	12	40	3.33
Other agricultural uses	32	106	3.31
Total or average	62	206	3.32
Chemical and metallurgical:			
Cement manufacture	(3/)	(3/)	2.75
Lime manufacture	492	2,550	5.18
Flux stone	(3/)	(3/)	9.21
Sulfur oxide removal	2	7	3.50
Special, mine dusting or acid water treatment	1	5	5.00
Unspecified: 4/			
Reported	1,270	5,010	3.94
Estimated	520	2,000	3.77
Total or average	1,790	6,960	3.89
Grand total or average	4,220	19,000	4.49

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 granite, limestone, miscellaneous stone, quartzite, shell, and traprock.
3/ Withheld to avoid disclosing company proprietary data; included in "Grand total."
4/ Reported and estimated production without a breakdown by end use.

TABLE 4
IDAHO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,
BY MAJOR USE CATEGORY 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	1,520	$6,340	$4.18
Plaster and gunite sands	8	30	3.75
Concrete products (blocks, bricks, pipe, decorative, etc.)	42	273	6.50
Asphaltic concrete aggregates and other bituminous mixtures	903	3,720	4.12
Road base and coverings	3,770	12,300	3.27
Fill	449	1,280	2.84
Snow and ice control	69	447	6.48
Other miscellaneous uses 3/	12	138	11.50
Unspecified: 4/			
Reported	3,910	9,660	2.47
Estimated	4,800	14,000	2.92
Total or average	15,500	48,200	3.12

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."
1/ To avoid disclosing company proprietary data, no district tables were produced for 1999.
2/ Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
3/ Includes filtration and railroad ballast.
4/ Reported and estimated production without a breakdown by end use.