

# 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 1999, the preliminary estimated value<sup>1</sup> of nonfuel mineral production for Idaho was \$420 million, according to the U.S. Geological Survey (USGS). This was about a 4% decrease from that of 1998<sup>2</sup> and followed a 6.4% decrease from 1997 to 1998. The State remained at 32d among the 50 States in total nonfuel mineral production value, of which Idaho accounted for more than 1% of the U.S. total.

Phosphate rock, silver, construction sand and gravel, molybdenum, and gold were, by value, Idaho's leading nonfuel minerals. Continuing a trend, gold and molybdenum production and value decreased. In 1999, a more than \$10 million increase in phosphate rock plus smaller increases in crushed stone and dimension stone were more than balanced by decreases in other nonfuel minerals. The values of gold, molybdenum, construction sand and gravel, and silver (descending size of decrease) declined, resulting in the State's overall drop in value for the year. All other mineral commodities had relatively small increases, except for some small decreases in the values of copper, industrial garnet, and lead. In 1998, increases of almost \$20 million, \$10 million, and \$9 million, respectively, in silver, construction sand and gravel, and lead somewhat mitigated decreases in gold, molybdenum, and lime (totaling almost \$65 million), which were mostly responsible for the State's drop in value (table 1).

Based upon USGS estimates of the quantities produced in the United States during 1999, Idaho remained the only State to produce antimony ore and vanadium (from ferrophosphorous slag); second of three industrial garnet-producing States; third in silver, molybdenum, and lead (descending order of value); fourth in pumice and pumicite; sixth in feldspar; eighth of 12 gold-producing States; and ninth in gemstones. The State rose to second from third in the production of phosphate rock and to sixth from seventh in zinc. Additionally, the State was a

<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 1999 USGS mineral production data published in this chapter are preliminary estimates as of May 2000, 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 for 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.

<sup>2</sup>Values, percentage calculations, and rankings for 1998 may vary from the Minerals Yearbook, Area Reports: Domestic 1998, Volume II, owing to the revision of preliminary 1998 to final 1998 data. Data for 1999 are preliminary and are expected to change; related rankings may also be subject to change.

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 metal mining continued to be constrained by the international downturn in metal prices and increased regulatory uncertainties related to environmental issues. Exploration was especially hard hit, but the phosphate mines and plants, Idaho's largest mineral industry, were also adjusting to new environmental expenditures and permitting requirements. Construction materials, such as sand and gravel and decorative stone, were in high demand. Mining and associated chemical and fertilizer processing employed approximately 3,380 persons in Idaho during the year.

Meridian Gold Co.'s Beartrack Mine in Lemhi County achieved a record production level in 1999, pouring 4,128 kilograms (kg) of gold and 5,392 kg of silver from 4.6 million metric tons (Mt) of ore during its final full year of production. Due to reduced gold prices and the consequent reduction of reserves, Beartrack will close in the first quarter of 2000. Reclamation of the North Pit was nearly complete, and mining centered on the South and Mason-Dixon Pits. The heap-leach operation employed 125 persons. The mine hosted an appreciatory open house on July 10 for hundreds of local citizens.

CSC Mining Co. continued development work at the Rescue Mine near Warren in Valley County. CSC started another ramp, built a new tailings pond, and made surface improvements while waiting for gold prices to improve. Idaho's other major gold mines have closed and were in reclamation. Kinross Gold Corp.'s DeLamar Mine in Owyhee County stopped mining and milling at the end of 1998 and was placed on care-and-maintenance status. Ore reserves at the DeLamar Mine have been exhausted, but much of the resource was conserved at the nearby Stone Cabin Mine. Reclamation of the Jacobs Gulch waste dump and parts of the Tip Top Pit at the nearby Stone Cabin Mine were underway. U.S. Antimony Corp. was also closing and reclaiming its small Yellowjacket gold-copper mine in Lemhi County. U.S. Antimony backfilled the pit with tailings.

North Idaho's famous Coeur d'Alene District, or Silver Valley, had three deep underground mines operating. Production in 1999 was down slightly from 1998, with some 404 metric tons (t) of silver produced versus 417 t in 1998. Substantial amounts of lead, zinc, and copper were also mined. Also, this area produces the only antimony ore in the United States. Lower silver and base metal prices cut into revenues at the three operating mines: Sunshine Mining Co.'s Sunshine

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

Mine, Hecla Mining Co.'s Lucky Friday Mine, and Silver Valley Resources Corp.'s Galena Mine. In September, Coeur d'Alene Mines acquired ASARCO Incorporated's 50% interest in Silver Valley Resources, giving Coeur d'Alene Mines 100% ownership of Silver Valley Resources, which includes the Galena Mine and the inactive Coeur Mine. Exploration drilling at Galena brought to light a new high-grade vein, the 117 vein, which was being developed on three levels. The new 72 vein was also unveiled. Sunshine announced new discoveries in the West Chance area of the Sunshine Mine at Kellogg early in the year. The company also started work on a major exploration ramp eastward from the Sunshine Mine to the Con Silver shaft, but a lack of funds shut down the project in November, some 396 meters (m) east of the Sunshine workings. Hecla Mining increased production to 137 t of silver at the Lucky Friday Mine in Mullan. More than 85% of the production was coming from the underhand and overhand stopes in the Gold Hunter deposit that has been in operation only since mid-1997.

Thompson Creek Mining Co. continued to operate its large molybdenum mine in Custer County, although molybdenum prices were low. About 7,700 t of molybdenum in concentrate and special high-performance lubricant grade was extracted from the open pit mine. Interim decisions from the U.S. Forest Service on a Supplemental Environmental Impact Statement allowed operation of the pyrite reduction plant to minimize sulfides in tailings used in the tailings dam.

Phosphate rock, from the Phosphoria Formation in Caribou County in southeastern Idaho, is the State's most valuable mineral commodity, and Idaho is the Nation's only producer of elemental phosphorus. Production from the four large open pit mines increased to over 6.2 Mt of crude ore in 1999. Simplot Co.'s Smoky Canyon Mine was the largest producer with 2.3 Mt of crude ore, which it then processed and pumped through a slurry pipeline to its phosphoric acid plant in Pocatello. Simplot drilled over 80 exploration holes. Agrium Inc. operated the Rasmussen Ridge Mine and upgraded its fertilizer plant at Conda. Solutia Inc. extracted 1.2 Mt from the Enoch Valley Mine, and completed a highway underpass and 500-m overland conveyor for safer ore unloading at its elemental phosphorus plant in Soda Springs. FMC Corp. mined the B pit at its Dry Valley Mine and worked on reducing dust emissions and making other environmental improvements at its large elemental plant in Pocatello, as required in an agreement with the U.S. Environmental Protection Agency. All of the companies were developing better plans and mitigation for selenium, a natural constituent of the waste shales, in new mines and in existing pits and waste dump reclamation. In corporate news, FMC and Solutia Inc. announced a marketing joint venture, Astaris LLC, and, in October, FMC and Agrium Inc. announced plans to build a \$90 million new purified phosphoric acid plant at Conda. The plant will be built and operated by Agrium.

In other industrial mineral highlights, demand for aggregate and decorative stone was strong. Ash Grove Cement Co. had another record year of clinker production at its cement plant at Inkom. L and W Stone expanded its Three Rivers stone quarry near Clayton. Teague Minerals Co. reported good sales of Idaho zeolite from the CH pit in Owyhee County. Hess Pumice Products Inc. purchased the Malad perlite operation from Idaho Minerals Co. for \$3.5 million, and opened a new pit. Hess also produces ultrafine, ultrapure pumice powder used for polishing television screens.

Exploration, particularly outside of active mining operations, was minimal, due to low metal prices and Federal restrictions focusing on endangered species and water-quality issues. Formation Capital Corp. drilled 11 core holes, totaling 1,600 m, into its Sunshine project in the Blackbird Mining District of Lemhi County. The district is one of two high-grade cobalt deposits in the United States. The drilling extended the ore horizons along strike and down dip. Results of this year's drilling and a prefeasibility study by Mine Development Associates were encouraging, and Formation started environmental baseline monitoring during the fall. Reserves to date are over 1.4 Mt of copper-cobalt-gold ore suitable for underground mining and milling to produce both copper and cobalt concentrates. Formation's property also includes numerous untested targets in the district.

Dormant precious metal projects with drilled out resources included the Petsite and Buffalo Gulch projects near Elk City in Idaho County, the Thunder Mountain project east of Yellow Pine, the Atlanta project in Elmore County, and the Kilgore property in eastern Idaho. And finally, Intergold Corp. faced lawsuits and Internet accusations over the gold assays on their Blackhawk property north of Shoshone in Lincoln County. The company had reported gold mineralization in unaltered rhyolite, but normal fire assays could not recover the gold, and many geologists remained skeptical of the project. After many promotional press releases, stock sales, and the start of chain-of-custody drilling by Dames and Moore Group, the company sued its consultants and labs. In January 2000, Intergold announced that new tests concluded that economic gold mineralization was not present at the property and that the company was ceasing its efforts there.

Government actions and legislation related to mining were restricted to environmental issues, and virtually all of the major mining concerns were affected. The Bunker Hill Superfund cleanup was nearing completion, although some Federal agencies and tribes were considering extension of the Superfund designation to the entire Coeur d'Alene River basin. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly known as Superfund) actions also reached the southeastern Idaho phosphate producers, as the South Maybe Canyon site was put on the Superfund list due to selenium leaching from the old waste dumps. The Selenium Task Force continued sampling programs and research on ways to minimize the selenium releases. Exploration, whether by major companies or recreational dredge miners, was adversely affected by additional endangered species designations and habitat restrictions, as well as by the Federal Government's initiation of a potential road-free area withdrawal on Federal lands in the West.

At the State level, the mining industry and the Idaho Department of Lands agreed on a new program to divert part of the mine license tax to a new fund that would be used to reclaim inactive and abandoned mine sites. Interagency efforts to identify problems and to inventory inactive and abandoned mine sites continued, with the IGS conducting many of the field examinations.

Environmental reclamation projects around Idaho included the Bunker Hill Superfund site, Triumph Mine in central Idaho, Blackbird Mine in Lemhi County, several closed gold mines, and most notably the Stibnite Mine in Valley County. After mining during World War II, the Bradley Mill tailings have had

long standing and difficult environmental problems. The tailings occupy about 32 hectares of Meadow Creek drainage at Stibnite. In recognition of its outstanding work and commitment, Mobil Oil Corp. and its contractors, Woodward-

Clyde and Nelson Construction, were awarded Idaho Land Board Reclamation awards for their successful efforts to stabilize the Bradley Mill tailings and to restore the Meadow Creek channel and fish habitat.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

| Mineral  |             | 1997     |           | 1998     |            | 1999 p/  |         |
|--|-------------|----------|-----------|----------|------------|----------|---------|
|  |             | Quantity | Value     | Quantity | Value      | Quantity | Value   |
| Antimony   | metric tons | 356      | W         | 242      | W          | W        | W       |
| Gemstones  |             | NA       | 687       | NA       | 321        | NA       | 357     |
| Gold 3/  | kilograms   | 7,490    | 80,100    | W        | W          | W        | W       |
| Pumice and pumicite  | metric tons | 83,100   | 758       | 73,400   | 686        | 75,100   | 717     |
| Sand and gravel:   |             |          |           |          |            |          |         |
| Construction   |             | 14,800   | 42,700    | 16,600   | 52,400     | 13,500   | 43,400  |
| Industrial   |             | 630      | 7,950     | 710      | 8,470      | 658      | 9,130   |
| Silver 3/  | metric tons | 341      | 53,600    | 447      | 73,200     | 401      | 69,000  |
| Stone:   |             |          |           |          |            |          |         |
| Crushed  |             | 3,910 4/ | 18,700 4/ | 4,180    | 18,400     | 4,800    | 21,600  |
| Dimension  |             | W        | W         | 15,900   | 4,710      | 28,900   | 7,480   |
| Combined values of cement [masonry (1997), portland], copper, feldspar, garnet (industrial), lead, lime, molybdenum, perlite (crude), phosphate rock, stone [crushed quartzite (1997), dimension quartzite and miscellaneous (1997)], vanadium ore, zinc, and values indicated by symbol W |             |          |           |          |            |          |         |
| Total  |             | XX       | 264,000   | XX       | 281,000 r/ | XX       | 268,000 |
|  |             | XX       | 469,000   | XX       | 439,000 r/ | XX       | 420,000 |

p/ Preliminary. r/ Revised. 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/ Excludes certain stones; value included with "Combined values" data.

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

| Kind                | 1997               |                                 |                   |            | 1998               |                                 |                   |            |
|---------------------|--------------------|---------------------------------|-------------------|------------|--------------------|---------------------------------|-------------------|------------|
|                     | Number of quarries | Quantity (thousand metric tons) | Value (thousands) | Unit value | Number of quarries | Quantity (thousand metric tons) | Value (thousands) | Unit value |
| Limestone           | 7                  | 1,150                           | \$5,860           | \$5.09     | 7                  | 1,040                           | \$4,030           | \$3.88     |
| Granite             | 3                  | 140                             | 243               | 1.74       | 4                  | 256                             | 911               | 3.56       |
| Quartzite           | 4                  | W                               | W                 | W          | 8                  | 466                             | 2,050             | 4.41       |
| Shell               | --                 | --                              | --                | --         | 1                  | 23                              | 77                | 3.35       |
| Traprock            | 22                 | 1,460                           | 6,420             | 4.39       | 25                 | 1,900                           | 8,960             | 4.72       |
| Miscellaneous stone | 4                  | 1,160                           | 6,190             | 5.35       | 11                 | 497                             | 2,320             | 4.66       |
| Total or average    | XX                 | 3,910                           | 18,700            | 4.78       | XX                 | 4,180                           | 18,400            | 4.39       |

W Withheld to avoid disclosing company proprietary data. XX Not applicable. -- Zero.

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 1998, BY USE 1/ 2/

| Use   | Quantity<br>(thousand<br>metric tons) | Value<br>(thousands) | Unit<br>value |
|---|---------------------------------------|----------------------|---------------|
| <b>Coarse aggregate (+1 1/2 inch):</b>        |                                       |                      |               |
| Riprap and jetty stone                        | 68                                    | \$357                | \$5.25        |
| Filter stone                                  | 50                                    | 263                  | 5.26          |
| Other coarse aggregate                        | 88                                    | 349                  | 3.97          |
| Total or average                              | 206                                   | 969                  | 4.70          |
| <b>Coarse aggregate, graded:</b>              |                                       |                      |               |
| Concrete aggregate, coarse                    | W                                     | W                    | 3.85          |
| Bituminous aggregate, coarse                  | 124                                   | 657                  | 5.30          |
| Bituminous surface-treatment aggregate        | 30                                    | 126                  | 4.20          |
| Railroad ballast                              | W                                     | W                    | 8.50          |
| Other graded coarse aggregate                 | W                                     | W                    | 4.68          |
| Total or average                              | 257                                   | 1,210                | 4.69          |
| <b>Fine aggregate (-3/8 inch):</b>            |                                       |                      |               |
| Stone sand, bituminous mix or seal            | W                                     | W                    | 4.40          |
| Screening, undesignated                       | W                                     | W                    | 3.33          |
| Other fine aggregate                          | W                                     | W                    | 4.40          |
| Total or average                              | 50                                    | 191                  | 3.82          |
| <b>Coarse and fine aggregates:</b>            |                                       |                      |               |
| Graded road base or subbase                   | 430                                   | 1,900                | 4.41          |
| Unpaved road surfacing                        | 163                                   | 604                  | 3.71          |
| Crusher run or fill or waste                  | 47                                    | 239                  | 5.09          |
| Other coarse and fine aggregates              | 239                                   | 1,050                | 4.40          |
| Total or average                              | 879                                   | 3,790                | 4.31          |
| <b>Agricultural:</b>                          |                                       |                      |               |
| Poultry grit and mineral food                 | 11                                    | 37                   | 3.36          |
| Other agricultural uses                       | 33                                    | 108                  | 3.27          |
| Total or average                              | 44                                    | 145                  | 3.30          |
| <b>Chemical and metallurgical:</b>            |                                       |                      |               |
| Cement manufacture                            | W                                     | W                    | 3.30          |
| Lime manufacture                              | W                                     | W                    | 4.21          |
| Flux stone                                    | W                                     | W                    | W             |
| Sulfur oxide removal                          | 2                                     | 5                    | 2.50          |
| Total or average                              | 896                                   | 3,450                | 3.84          |
| Special: Mine dusting or acid water treatment | 2                                     | 8                    | 4.00          |
| <b>Unspecified: 3/</b>                        |                                       |                      |               |
| Actual  | 1,430                                 | 6,740                | 4.73          |
| Estimated                                     | 421                                   | 1,860                | 4.42          |
| Total or average                              | 1,850                                 | 8,600                | 4.66          |
| Grand total or average                        | 4,180                                 | 18,400               | 4.39          |

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/ Includes granite, limestone, miscellaneous stone, sandstone and quartzite, traprock, and volcanic cinder and scoria.

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

TABLE 4  
IDAHO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,  
BY MAJOR USE CATEGORY 1/ 2/

| Use   | Quantity<br>(thousand<br>metric tons) | Value<br>(thousands) | Unit<br>value |
|---|---------------------------------------|----------------------|---------------|
| Concrete aggregate  | 1,390                                 | \$5,960              | \$4.30        |
| Plaster and gunite sands                                    | 14                                    | 70                   | 5.00          |
| Concrete products (blocks, bricks, pipe, decorative, etc.)  | 27                                    | 225                  | 8.33          |
| Asphaltic concrete aggregates and other bituminous mixtures | 1,140                                 | 4,190                | 3.68          |
| Road base and coverings 3/                                  | 5,680                                 | 18,800               | 3.31          |
| Fill  | 601                                   | 1,320                | 2.20          |
| Snow and ice control  | 89                                    | 393                  | 4.42          |
| Railroad ballast  | 8                                     | 30                   | 3.75          |
| Other miscellaneous uses 4/                                 | 185                                   | 631                  | 3.41          |
| Unspecified: 5/   |                                       |                      |               |
| Actual  | 3,170                                 | 7,880                | 2.49          |
| Estimated   | 4,310                                 | 12,900               | 2.99          |
| Total or average  | 16,600                                | 52,400               | 3.16          |

1/ To avoid disclosing company proprietary data, no district tables were produced for 1998.

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

3/ Includes road and other stabilization (cement).

4/ Includes filtration.

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