

THE MINERAL INDUSTRY OF MAINE

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

In 1998, the preliminary estimated value¹ of nonfuel mineral production for Maine was \$76.2 million, according to the U.S. Geological Survey (USGS). This was almost a 9% increase from that of 1997,² and followed a 2.3% increase in 1997 from that of 1996. Maine's increase in value in 1998 mostly resulted from increases in the values of construction sand and gravel, crushed stone (table 1), and portland cement that totaled almost \$7.5 million. (Listing of minerals is in descending order of change in value.) Peat showed a small, yet significant decrease and gemstones decreased marginally; all other minerals had small increases. In 1997, the mineral commodities mostly responsible for the State's increase were peat and construction sand and gravel.

Based on USGS estimates of the quantities of peat produced in the United States, Maine was 11th² in peat in 1998. Previously, the State had risen to 3d in 1997 after being 7th in 1996.

The Maine Geological Survey (MGS) provided the following narrative information.³ Freewest Resources Canada Inc., continued a grass roots gold exploration program along the Maine-New Brunswick, Canada, border on its "Golden Ridge Property." The gold occurrence was indicated initially by anomalous gold values in a regional till sampling project by the Province of New Brunswick in 1992 and refined through followup sampling. Detailed airborne and ground geophysical surveys by Freewest show strong magnetic and induced polarization anomalies over the Ordovician Poplar Mountain volcanic-plutonic complex near Fosterville, New Brunswick, and over the adjacent area in Amity, ME. Detailed soil sampling has shown anomalous values for arsenic, antimony, and gold over the geophysical anomalies. Rock grab samples returned assay values up to 8.1 grams per metric ton gold (Northern Miner, 1998). Bedrock geology on

the Maine side has not been mapped in detail due to poor outcrop, but includes mineralized felsic pyroclastic rocks and altered basalts. Some float blocks include massive sulfide clasts. Outcrop stripping and trenching were done on the New Brunswick claim late in 1998. Exploratory drilling is planned for 1999. The Maine property is owned by Champion International Corp., which has a lease agreement with Freewest (Freewest Resources Canada Inc., 1998).

At the close of 1997, NNM Resources, Inc., a wholly owned subsidiary of Black Hawk Mining Inc., submitted a permit application to open a gold and silver mine about 24 kilometers west of Ashland at the Bald Mountain deposit in the T12 R8 section (an unorganized township) of Aroostook County. The application is for surface mining of just the gossan cap, which was estimated at the time of application at 1.1 million metric tons of 4.5 grams per ton gold and 101 grams per ton silver. It overlies the 32-million-ton base metal sulfide deposit (zinc, copper, gold, and silver). The application was reviewed by the Maine Land Use Regulation Commission and the Maine Department of Environmental Protection, with comments and questions returned to the applicant in March. At the end of 1998, due to low gold prices, Black Hawk requested and was granted an extension of the application review period to January 2000. The application remains in the permit review process.

At Alder Pond, a 1.5-million to 3-million-ton copper-zinc-lead deposit in Somerset County, northwestern Maine, Prospectors Alliance Ltd. completed a stepout drilling program early in 1998. The property is owned by GCO Minerals Co. The recent drilling was done by Prospectors Alliance Corporation of Toronto in joint venture with International Larder Minerals, Inc. At the end of 1998, the exploration permit was allowed to expire.

Geologists from the USGS continued study of the Bald Mountain deposit of northern Maine to characterize its mineralization and geologic setting. Stratigraphic, structural, mineralogical, and geochemical aspects all indicate that the deposit is a well-preserved submarine volcanogenic massive sulfide deposit, with both exhalative and seafloor hydrothermal deposits (Slack and others, 1998; Busby and others, 1998). Regional tectonic and exploration models will need revision because of an unexpected finding. Bald Mountain volcanics are chemically similar to primitive ocean-arc volcanic rocks and not to back-arc basin rocks as had been inferred from nearby areas (Schulz and Ayuso, 1998).

Through a cooperative program with the USGS, MGS has initiated a project to compile a geographically referenced data base of known occurrences, prospects, and mines of economic minerals in the State. The data base, being compiled by a contractor, will draw from a variety of published and unpublished information and will be available to the public. Most localities will not be verified in the field.

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on 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 1998 USGS mineral production data published in this chapter are preliminary estimates as of February 1999 and are expected to change. For some mineral commodities (for example, 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 <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 <http://minerals.usgs.gov/minerals>; facsimile copies may be obtained from MINES FaxBack.

²Values, percentage calculations, and rankings for 1997 may vary from the *Minerals Yearbook, Area Reports: Domestic 1997, Volume II*, owing to the revision of preliminary 1997 to final 1997 data. Data for 1998 are preliminary and expected to change, while related rankings may also be subject to change.

³Henry N. Berry IV, Physical Geologist, authored the text on mineral industry information submitted by the Maine Geological Survey.

Amateur and professional mineral collectors continued to work in Maine. Numerous Maine pegmatites, including the Berry, Tamminen, and Georgetown quarries were prospected for tourmaline and other minerals. Rare phosphate species continue to be found in pegmatite at the Estes crushed-rock quarry in West Baldwin. Over 30 minerals have been identified from this quarry to date. The MGS published the third edition of the *Collector's Guide to Maine Mineral Localities*. The 1998 Maine Mineral Symposium in Augusta attracted over 300 participants.

References Cited

Busby, C.J., Schulz, K.J., Foose, M.P., and Slack, J.F., 1998, Deepwater explosive volcanic setting of a massive sulfide deposit in a primitive

oceanic arc terrane, northern Maine: Geological Society of America, Abstracts with Programs, v. 30, no. 7, p. A-18.
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 Northern Miner, 1998, Freewest targets gold at Golden Ridge: Northern Miner, v. 84, no. 33, October 12-18, p. 13.
 Schulz, K.J., and Ayuso, R.A., 1998, Geochemistry of Ordovician volcanic rocks, northern Maine, and implications for the tectonic setting of the Bald Mountain and Mt. Chase massive sulfide deposits: Geological Society of America, Abstracts with Programs, v. 30, no. 7, p. A-18.
 Slack, J.F., Foose, M.P., Belkin, H.E., Flohr, M.J.K., and Scully, M.V., 1998, Exhalative and seafloor replacement processes in the evolution of the Bald Mountain massive sulfide deposit, northern Maine: Geological Society of America, Abstracts with Programs, v. 30, no. 7, p. A-18.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1996		1997		1998 n/	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones	NA	223	NA	230	NA	227
Peat	18	960	W	W	W	W
Sand and gravel: Construction	6,440	27,500	6,280	28,400	7,100	33,100
Stone: Crushed	2,760	14,800	2,540	15,100	2,800	16,800
Combined values of cement, clays (common), stone (dimension granite), and values indicated by symbol W	XX	25,000	XX	26,500	XX	26,000
Total	XX	68,600	XX	70,200	XX	76,200

n/ 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 three significant digits; may not add to totals shown.

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

Kind	1996				1997			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	5 r/	1,230 r/	\$6,480 r/	\$5.28 r/	5	1,030	\$6,400	\$6.24
Granite	3	W	W	5.04	3	W	W	5.71
Quartzite	2 r/	W	W	5.46 r/	2	W	W	5.65
Slate	2	W	W	7.11	2	W	W	7.28
Traprock	2	W	W	5.77	2	W	W	5.50
Miscellaneous stone	1	W	W	3.98	5	W	W	4.06
Total	XX	2,760	14,800	5.38	XX	2,540	15,100	5.93

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

1/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 3
 MAINE: CRUSHED STONE SOLD OR USED BY PRODUCERS
 IN 1997, BY END USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch): Other coarse aggregate 3/	59	\$370	\$6.27
Coarse aggregate, graded: Other coarse aggregate 4/	268	1,480	5.53
Fine aggregate (-3/8 inch): Other fine aggregate 5/	166	1,110	6.66
Coarse and fine aggregate: Other construction materials 6/	282	1,840	6.52
Chemical and metallurgical:			
Cement manufacture	W	W	5.51
Lime manufacture	W	W	5.64
Unspecified: 7/			
Actual	695	4,100	5.89
Estimated	551	3,300	5.99
Total	2,540	15,100	5.93

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

1/ Data are rounded to three significant digits; may not add to totals shown.

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

3/ Includes filter stone and riprap and jetty stone.

4/ Includes bituminous aggregate (coarse) and railroad ballast.

5/ Includes stone sand (concrete) and screening (undesignated).

6/ Includes graded road base or subbase and other coarse and fine aggregates.

7/ Includes reported and estimated production without a breakdown by end use.

TABLE 4
 MAINE: CRUSHED STONE SOLD OR USED BY PRODUCERS
 IN 1997, BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

Use	District 1	
	Quantity	Value
Construction aggregates:		
Coarse aggregate (+1 1/2 inch) 2/	W	W
Coarse aggregate, graded 3/	W	W
Fine aggregate (-3/8 inch) 4/	W	W
Coarse and fine aggregate 5/	W	W
Other construction materials	774	4,800
Chemical and metallurgical 6/	(7/)	(7/)
Unspecified: 8/		
Actual	(7/)	(7/)
Estimated	(7/)	(7/)
Total	2,540	15,100

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

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes filter stone, riprap and jetty stone, and other coarse aggregate.

3/ Includes bituminous aggregate (coarse) and railroad ballast.

4/ Includes stone sand (concrete), screening (undesignated), and other fine aggregate.

5/ Includes graded road base or subbase, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.

6/ Includes cement manufacture and lime manufacture.

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

8/ Includes reported and estimated production without a breakdown by end use.

TABLE 5
 MAINE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1997,
 BY MAJOR USE CATEGORY 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand) 3/	661	\$3,290	\$4.97
Asphaltic concrete aggregates and other bituminous mixtures	886	6,930	7.83
Road base and coverings 4/	1,410	4,840	3.45
Fill	674	1,720	2.55
Snow and ice control	777	2,500	3.22
Filtration	5	41	8.20
Other miscellaneous uses 5/	202	847	4.19
Unspecified: 6/			
Actual	645	3,900	6.04
Estimated	1,030	4,360	4.25
Total or average	6,280	28,400	4.53

1/ To avoid disclosing company proprietary data, no district tables were produced for 1997.

2/ Data are rounded to three significant digits; may not add to totals shown.

3/ Includes concrete products.

4/ Includes road and other stabilization (cement and lime).

5/ Includes railroad ballast.

6/ Includes reported and estimated production without a breakdown by end use.