

# THE MINERAL INDUSTRY OF VERMONT

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

In 1998, the preliminary estimated value<sup>1</sup> of nonfuel mineral production for Vermont was \$96 million, according to the U.S. Geological Survey (USGS). This was almost a 15% increase from that of 1997,<sup>2</sup> following an even larger 26.5% increase from 1996 to 1997.

Crushed stone, Vermont's leading nonfuel mineral commodity, led the State's other nonfuel minerals with a \$6 million increase in value in 1998 (table 1). Dimension stone and construction sand and gravel followed with increases of more than \$4 million and more than \$2 million, respectively. Talc and gemstones (listings are by descending order of value) remained unchanged. In 1997, crushed stone also led the State's rise in value with an increase of \$21.7 million, followed by successively smaller increases in talc and construction sand and gravel. In 1997, only dimension stone showed a drop in value, although a greater quantity was produced in 1997 than in 1996; gemstones remained unchanged from 1996.

Compared with USGS estimates of the quantities produced in the United States during 1998, Vermont remained second<sup>2</sup> among the States that produced dimension stone and third among those producing talc.

The Vermont Geological Survey (VGS) provided the following narrative information.<sup>3</sup> Rock of Ages Corp., which actively quarries 13 dimension stone sites throughout the United States and Canada, resumed operations on March 4 at its Barre and Bethel locations. The company's two quarries in Barre were active throughout the normal working season in 1998. This included the E.L. Smith Quarry which produces Medium to Light Barre Gray granite and the Adam Quarry which produces Dark Barre Gray granite. Planned production levels were met for the year and the quarries closed for the winter on December 18. The Bethel quarry also operated

during the same time period in 1998 and planned production levels were met at this location as well. Bethel White granite was chosen for the exterior of the "Little America Grand Hotel" in Salt Lake City. The hotel will host officials and dignitaries from throughout the world for the 2002 Winter Olympics. Approximately 1,400 cubic meters of blocks were used for this one project, making it the largest use ever for Bethel White for an individual building in the quarry's modern day history.

Barre Granite Quarries LLC filed an Act 250 (Vermont's Land Use and Development Law) application for a proposed granite quarry in Sheffield. The application received preliminary comments from the Vermont Agency of Natural Resources in December, but an Act 250 permit had not yet been issued at yearend.

OMYA, Inc. received Act 250 permits in October and November 1997 for expansion of the Middlebury Quarry. The plans included relocation and construction of an access road as well as expansion of the quarry to the south.

According to US Quarried Slate Products, Vermont colored slates are in demand for use as high-quality roofing products. However, the low tariff for most foreign competitors has allowed importation of a lower-price (as well as lower quality) flooring tile, thus reducing the demand for Vermont flooring products.

## Government Actions and Programs

The VGS, in cooperation with the USGS Eastern Mineral Resources Program, completed an update of Vermont's mineral resource-data. The VGS contracted with F.M. Beck Inc. of Yarmouth, ME, to review the 700 Vermont listings in the USGS Mineral Resources Data System (or, MRDS) for accuracy and to make corrections and additions where necessary. The new data base contains 729 records of metallic and nonmetallic mineral deposits. One hundred and ninety-two new records were added to the data base and 138 records were amended. About 75 of the additions were small quarries registered under Act 30. (Act 30 established a slate quarry registration program whereby quarries which are properly registered are deemed to be active (not abandoned) and yet exempt from certain requirements of the Act 250 law: in particular for enumerated "ancillary activities," i.e., "drilling, crushing, grinding, sizing, washing, drying, sawing and cutting stone, blasting, trimming, punching, splitting and gauging, and use of buildings and the use and construction of equipment exclusively to carry out the above activities".) The updated assessment will be used in a planning process that focuses on how the VGS can best serve the citizens of the State in regards to mineral-resource issues.

The VGS, also known as the Division of Geology and Mineral Resources in Vermont's Department of Environmental Conservation, conducts surveys and research of the geology, mineral resources, and topography of the State.

<sup>1</sup>The 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. Construction sand and gravel and crushed stone 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.

<sup>2</sup>Values, 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.

<sup>3</sup>Marjorie Gale, a Geologist with the Vermont Geological Survey, authored the State's minerals industry information.

Of late, emphasis has been on preparation of a bedrock map of Vermont and interim digital map products. A surficial mapping program began in 1996. The State Geologist manages interdisciplinary studies with strong geologic components, especially those focused on surface waters and groundwater resources. Review of projects as they relate to Criteria 9D and 9E of the aforementioned Act 250 is a VGS activity that recognizes the importance of lands with high potential for extraction of mineral and earth resources. The VGS also reviews and makes recommendations regarding mine and quarry reclamation plans in response to current environmental concerns. Published reports are prepared and made available to the public, consultants, industry, and government. The VGS collates and disseminates this practical knowledge in packages ready for the consumer, providing geologic aid and advice to the public as required by State statute.

The VGS also provides advice concerning the development and working of rock and mineral deposits suitable for building, road making, and economic purposes. The VGS maintains an archive of old and new information as per State statute. In the event of any significant discovery of hydrocarbons in the State, the VGS provides geologic services for Vermont's Natural Gas and Oil Resources Board.

### Mine Reclamation and Environmental Activities

Significant mine reclamation activity took place in 1998 in the talc industry. A mine and mill reclamation project, begun in 1994, was successfully accomplished at the old talc Mill in Johnson, Lamoille County. Old Mill Park, established on the site of the mill, the old tailings, and the tailings pond, was a

cooperative project between Luzenac America, Inc. and the Town of Johnson. The park, dedicated on July 4, has three ball fields, two soccer fields, and a playground.

Luzenac America in Ludlow moved ahead with plans to reclaim and backfill the Blackbear Mine site. The site reclamation plan was previously outlined in the long-range plan for Luzenac's Argonaut Mine. Although initially the plan was to backfill the Blackbear Mine in 2010, the company accelerated the schedule and plans to transfer overburden material from the Argonaut Mine to the site beginning in the spring of 1999.

In December, Champlain Marble Co., the owners of the Fisk Quarry on Isle LaMotte at the northern end of Lake Champlain, proposed to sell their land to conservation groups for \$200,000, a price well below market value. The inactive quarry was the source of world famous "Radio City Black" marble. During recent years, the quarry has provided habitat for birds, animals, and plant life. The rocks in Fisk Quarry, part of the Chazy Reef system, have abundant, well-exposed, easily accessible fossils that scientists and schoolchildren have studied for decades. In 1995, the company had purchased the quarry and proposed to reopen mining operations. This did not take place, in part due to the efforts of citizens who have been working to preserve the Fisk Quarry for over 10 years. Upon completion of the sales transaction the quarry will be owned by a newly formed nonprofit organization called the Isle La Motte Reefs Preservation Trust, with a conservation easement held by the Lake Champlain Land Trust to assure the quarry's preservation in perpetuity for scientific research and education. A board of directors was being formed, as well as a science advisory committee, which will help to develop a policy of responsible stewardship.

TABLE 1  
NONFUEL RAW MINERAL PRODUCTION IN VERMONT 1/ 2/  
(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1996		1997 r/		1998 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones	NA	1	NA	1	NA	1
Sand and gravel: Construction Stone:	3.870	15.200	3.890	15.800	4.300	18.000
Crushed	4.560	22.800	7.840	44.500	8.400	50.400
Dimension metric tons	99.600	27.900	105.000	23.200	108.000	27.600
Total 3/	XX	66.000	XX	83.500	XX	96.000

p/ Preliminary. r/ Revised. 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 three significant digits; may not add to totals shown.

3/ Partial total, excludes values that must be concealed to avoid disclosing company proprietary data.

TABLE 2  
VERMONT: 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	6	2.260	\$8.440	\$3.74	7	3.400	\$11.900	\$3.49
Dolomite	2	W	W	9.10 r/	7	W	W	9.19
Marble	3	1.030	4.610	4.46	3	1.490	6.670	4.49
Granite	2	W	W	5.82 r/	2	W	W	6.17
Quartzite	3	1.120	8.600	7.71	3	2.780	24.500	8.81
Slate	1	W	W	10.21 r/	1	W	W	10.33
Total	XX	4,560	22,800	5.01	XX	7,840	44,500	5.67

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

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

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

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch): Riprap and jetty stone	W	W	W
Coarse aggregate, graded:			
Concrete aggregate, coarse	132	\$1,120	\$8.45
Bituminous aggregate, coarse	326	2,250	6.89
Railroad ballast	67	548	8.18
Other graded coarse aggregate	85	846	9.95
Fine aggregate (-3/8 inch):			
Stone sand, concrete	27	206	7.63
Stone sand, bituminous mix or seal	281	1,880	6.67
Screening, undesignated	54	480	8.89
Other fine aggregate	79	566	7.16
Coarse and fine aggregates:			
Graded road base or subbase	87	509	5.85
Unpaved road surfacing	113	633	5.60
Crusher run or fill or waste	75	147	1.96
Drain fields	3	9	3.00
Other coarse and fine aggregates 3/	240	1,960	8.18
Agricultural: Other agricultural uses	W	W	W
Chemical and metallurgical: Lime manufacture	585	2,370	4.05
Unspecified: 4/			
Actual	3,560	22,200	6.26
Estimated	2,110	8,550	4.05
Total	7,840	44,500	5.67

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

1/ Includes dolomite, granite, limestone, marble, quartzite, and slate.

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

3/ Includes terrazzo and exposed aggregate.

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

TABLE 4  
VERMONT: 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 and concrete products	408	\$2.750	\$6.74
Plaster and gunitite sands	6	50	8.33
Asphaltic concrete aggregates and other bituminous mixtures	211	978	4.64
Road base and coverings 3/	1,200	4,860	4.06
Fill	188	445	2.37
Snow and ice control	333	1,180	3.53
Filtration	33	185	5.61
Other miscellaneous uses	236	1,370	5.79
Unspecified: 4/			
Actual	184	661	3.59
Estimated	1,090	3,370	3.09
Total or average	3,890	15,800	4.07

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 road and other stabilization (cement).

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