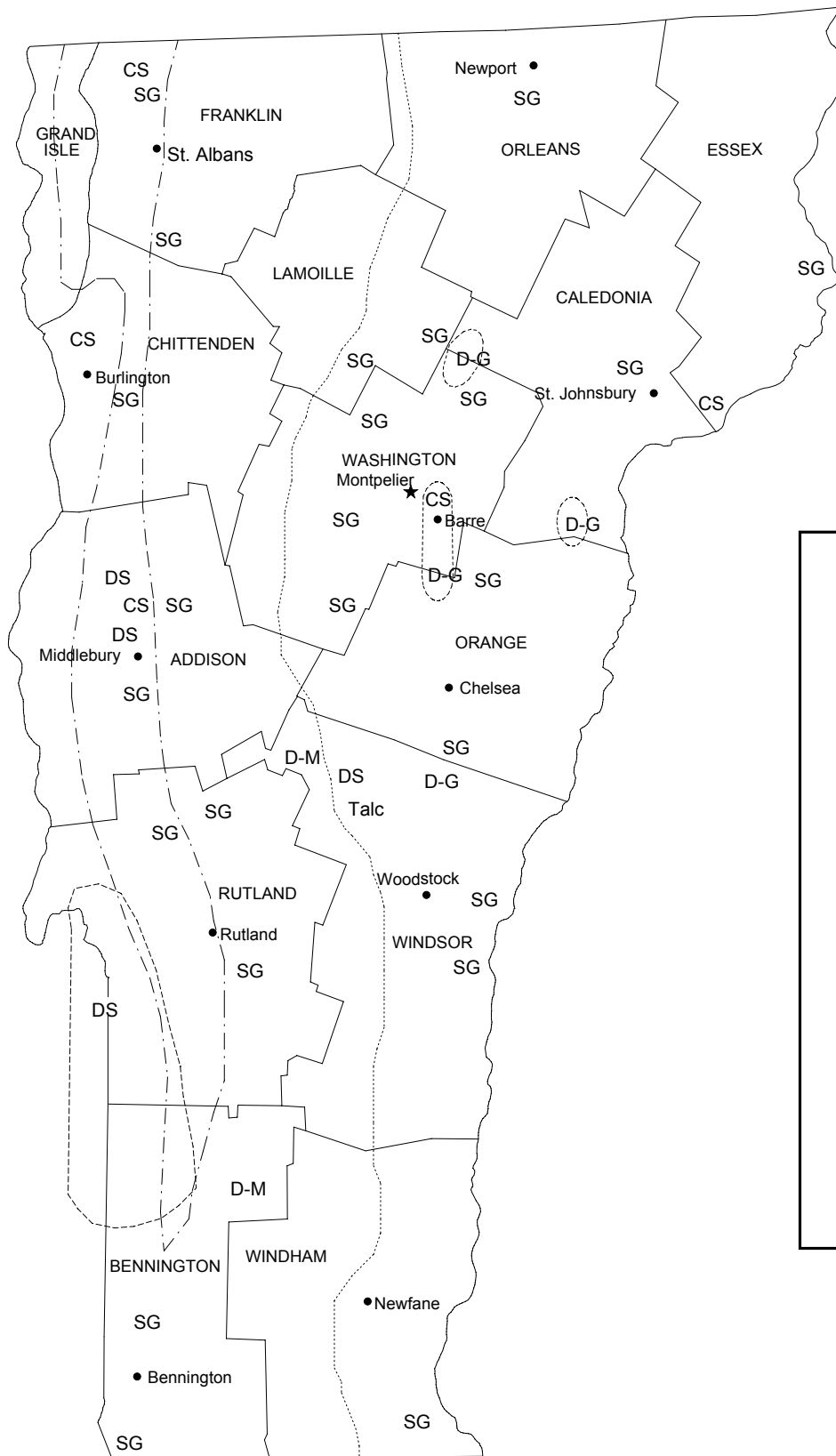


VERMONT



LEGEND

- County boundary
- ★ Capital
- City

MINERAL SYMBOLS (Major producing areas)

- CS Crushed stone
- D-G Dimension granite
- D-M Dimension marble
- DS Dimension stone
- SG Construction sand and gravel
- Talc Talc
- Concentration of mineral operations
- VT limestone-marble belt
- ⋯ Ultramafic trend, includes asbestos, talc, and verde antique operations

0 50 Kilometers

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 2001, the estimated value¹ of nonfuel mineral production for Vermont was \$68.9 million, based upon preliminary U.S. Geological Survey (USGS) data. This was a 3% increase compared with that of 2000² and followed a marginal decrease from 1999 to 2000. Because data for talc have been withheld to protect company proprietary data, the actual total values for 1999-2001 are higher than those reported in table 1.

In 2001, dimension stone was again Vermont's leading nonfuel mineral commodity, accounting for almost 38% of the State's reportable nonfuel mineral value. But construction sand and gravel, up approximately \$2.5 million, was the commodity most responsible for the State's increase for the year. In 2000, although dimension stone production and value were up, decreases in the same for crushed stone resulted in the slight net decrease in total nonfuel mineral value (table 1). Although data for talc has been withheld, its value followed the same trend as the State's total value from 1999 through 2001.

Compared with USGS estimates of the quantities produced in the United States during 2000, Vermont remained second among the States that produced dimension stone and third among those producing talc.

The Vermont Geological Survey (VGS) provided the following narrative information,³ which includes information from the VGS and responses from Rock of Ages Corp. to the annual VGS request for information on the State's quarry and mine operations.

In the granite industry, the Quarries Division at Rock of Ages Corp. reported a "relatively uneventful" 2001 for its quarries located in Vermont. The demand for Barre Gray granite declined during 2001 to the lowest level of demand in the modern history of the Barre, VT, quarries. On the other hand,

¹The 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 2001 USGS mineral production data published in this chapter are preliminary estimates as of August 2002 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. Specialist contact information may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals/contacts/comdir.html>; alternatively, specialists' names and telephone numbers may be obtained by calling USGS information at (703) 648-4000 or by calling the USGS Earth Science Information Center at 1-888-ASK-USGS (275-8747). All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

²Values, percentage calculations, and rankings for 2000 may differ from the Minerals Yearbook, Area Reports: Domestic 2000, Volume II, owing to the revision of preliminary 2000 to final 2000 data. Data for 2001 are preliminary and are expected to change; related rankings may also change.

³Marjorie Gale, Environmental Scientist III-Geologist with the Vermont Geological Survey, authored the text of mineral industry information submitted by that agency.

demand for Bethel White granite from the company's quarry in Bethel continued to be relatively strong in the Asian and European markets. Employment levels in the Barre quarries reached an alltime low, and workers were shifted, where possible, to the quarry in Bethel.

During 2001, Rock of Ages continued the introduction and the use of water-jet technology in the Barre Gray quarries for the channeling process. The water jet was used in conjunction with other types of channeling equipment such as the diamond wire saw and slot drill. The technology was still under evaluation.

Imports of finished monuments from overseas diminished the demand for Barre Gray granite. Rock of Ages therefore made every attempt to increase export activity from its many quarries located in other States and also from the quarry in Bethel.

As a result of increased exports and other endeavors in the export markets, Rock of Ages Corp.'s Quarries Division was awarded the Exporter of the Year award for 2001 from the Vermont International Business Council, which is part of the Vermont Chamber of Commerce. The award was presented in May 2002 by the Senior Trade Advisor of the U.S. Chamber of Commerce.

In other industry news, an environmental board ruled in February 2001 that a Rochester, VT, verde antique quarry needed to obtain an Act 250 permit. Act 250 is Vermont's land-use and development law. Vermont Verde Antique International subsequently filed an appeal with the State Supreme Court challenging the environmental board decision.

The Chairman of the Board of the Vermont Granite Museum of Barre reported both the beginning and completion of Phase I construction. The museum will be housed in the newly renovated Jones Brothers granite manufacturing company building. Renovation of the exterior of the granite shed on the Barre-Montpelier Road was the first stage in the development of the museum. The building was officially designated on the National Register for Historic Places, and all rehabilitation was done according to the U.S. Department of the Interior's Standards for Historic Preservation. The focus of the ambitious project, currently at its halfway point of completion, is on bringing a world-class museum and a Stone Arts School to central Vermont.

Government Programs

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. The VGS has of late concentrated its efforts mostly upon completion of the bedrock map of Vermont, new surficial mapping of the State by quadrangle and watershed, and a natural hazard map program. Current mapping projects address societal issues in Vermont:

landslide hazard, riverine erosion, and naturally occurring radionuclides in bedrock and ground water. Digital surficial and bedrock data are also used to customize HAZUS, an earthquake hazard computer program, to make it realistically simulate local Vermont conditions.

The State Geologist manages interdisciplinary studies with strong geologic components, especially those focused on surface waters, ground water resources, and geologic hazards. 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, 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, roadmaking, 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. Additional information about the VGS is available on the Internet at URL <http://www.anr.state.vt.us/geology/vgshmpg.htm>.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1999		2000		2001 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones	NA	1	NA	1	NA	1
Sand and gravel, construction Stone:	4,430	18,800	4,140	18,800	4,600	21,300
Crushed	5,400	22,800	5,210	21,500	5,100	21,600
Dimension metric tons	98,600	25,600	103,000	26,600	103,000	26,000
Talc, crude do.	W	(3/)	W	(3/)	W	(3/)
Total	XX	67,200	XX	66,900	XX	68,900

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary 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/ Value excluded to avoid disclosing company proprietary data.

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

Kind	1999				2000			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	8	2,440	\$10,400	\$4.27	7	2,210	\$8,780	\$3.98
Dolomite	3	W	W	W	3	W	W	W
Granite	3 r/	263	1,190	4.51	3	268	1,930	7.18
Marble	3	1,680	7,390	4.41	2	W	W	W
Quartzite	1 r/	W	W	W	1	W	W	W
Slate	1	W	W	W	1	W	W	W
Total or average	XX	5,400	22,800	4.23	XX	5,210	21,500	4.12

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
VERMONT: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2000, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	W	W	\$9.40
Other coarse aggregate	77	\$372	4.83
Coarse aggregate, graded:			
Concrete aggregate, coarse	114	506	4.44
Bituminous aggregate, coarse	W	W	3.92
Railroad ballast	W	W	3.96
Other graded coarse aggregate	270	1,380	5.09
Fine aggregate (-3/8 inch):			
Stone sand, bituminous mix or seal	W	W	8.00
Other fine aggregate	246	986	4.01
Coarse and fine aggregates:			
Graded road base or subbase	609	2,160	3.55
Unpaved road surfacing	185	788	4.26
Crusher run or fill or waste	W	W	3.38
Other coarse and fine aggregates	23	135	5.87
Unspecified: 3/			
Reported	346	1,430	4.14
Estimated	3,300	14,000	4.10
Total or average	5,210	21,500	4.12

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, quartzite, and slate.

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

TABLE 4
VERMONT: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2000,
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	484	\$3,130	\$6.47
Plaster and gunite sands	5	51	10.20
Asphaltic concrete aggregates and other bituminous mixtures	233	1,760	7.57
Road base and coverings	1,040	5,540	5.33
Fill	237	646	2.73
Snow and ice control	203	634	3.12
Other miscellaneous uses	53	330	6.23
Filtration	12	90	7.50
Unspecified: 2/			
Reported	244	857	3.51
Estimated	1,600	5,800	3.56
Total or average	4,140	18,800	4.55

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

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