

The Mineral Industry of Vermont

This chapter has been prepared under a Memorandum of Understanding between the Bureau of Mines, U.S. Department of the Interior, and the Office of the State Geologist, Agency of Environmental Conservation, for collecting information on all nonfuel minerals.

By Doss H. White, Jr.¹ and Charles A. Ratté²

Nonfuel mineral production in 1978 and 1979 added \$47.8 million and \$54.1 million, respectively, to the economy of Vermont. The State led the Nation in the production of talc, and ranked second in asbestos, dimension granite, dimension marble, and dimension slate. Mineral production was reported from all 14 counties. Dimension stone, crushed stone, and sand and gravel accounted for over 80% of mineral value during the biennium.

Trends and Developments.—Approximately 7% of the State's industrial workers were engaged in mineral extraction or in an industry relying heavily on mineral raw materials. However, in specific localities, employment in mineral production or proc-

essing was significant. In Barre, Washington County, 80% of the manufacturing firms produced stone (primarily granite monuments), clay, or glass products, and in Rutland County almost 20% of all firms mined, processed, or finished slate or marble. Granite working and finishing accounted for approximately 50% of manufacturing in Washington County.

Legislation and Government Programs.—A bill introduced by the Vermont Legislature, H.327, would require an Act 250 (Vermont's Development Control Law) permit for mineral prospecting and exploration beyond the reconnaissance level. The bill was the culmination of a West German firm's efforts to explore for, and possibly

Table 1.—Nonfuel mineral production in Vermont¹

Mineral	1977		1978		1979	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Sand and gravel --- thousand short tons. . .	3,405	\$5,837	3,726	\$6,425	3,660	\$6,240
Stone:						
Crushed ----- do -----	2,123	12,635	1,971	13,178	2,077	13,927
Dimension ----- do -----	121	14,561	137	17,681	180	23,006
Talc ----- do -----	310	2,006	315	2,238	346	2,755
Combined value of other nonmetals -----	XX	6,415	XX	8,311	XX	8,208
Total -----	XX	41,454	XX	47,833	XX	54,136

XX Not applicable.

¹ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

Table 2.—Value of nonfuel mineral production in Vermont, by county

County	(Thousands)		Minerals produced in 1978 in order of value
	1977	1978	
Addison -----	W	\$3,956	Stone, sand and gravel.
Bennington -----	\$593	958	Sand and gravel, stone.
Caledonia -----	W	W	Stone, sand and gravel.
Chittenden -----	W	W	Sand and gravel, stone.
Essex -----	W	W	Sand and gravel.
Franklin -----	W	W	Stone, sand and gravel.
Grand Isle -----	W	W	Stone.
Lamoille -----	W	W	Talc, sand and gravel, stone.
Orange -----	990	W	Stone, sand and gravel.
Orleans -----	W	W	Asbestos, sand and gravel, stone.
Rutland -----	W	11,755	Stone, sand and gravel.
Washington -----	W	W	Do.
Windham -----	W	162	Sand and gravel, stone.
Windsor -----	W	W	Talc, sand and gravel, stone.
Undistributed ¹ -----	39,869	31,003	
Total ² -----	41,454	47,833	

W Withheld to avoid disclosing company proprietary data; included with "Undistributed."

¹Includes gem stones and values indicated by symbol W.

²Data may not add to totals shown because of independent rounding.

Table 3.—Indicators of Vermont business activity

	1977	1978	1979 ^P	1978-79 percent change
Employment and labor force, annual average:				
Total civilian labor force ----- thousands -----	226.0	237.0	240.0	+1.3
Unemployment ----- do -----	16.0	14.0	12.0	+14.3
Employment (nonagricultural):				
Mining ----- do -----	.7	.7	.8	+14.3
Manufacturing ----- do -----	43.4	47.7	50.8	+6.5
Contract construction ----- do -----	8.2	10.0	10.3	+0.3
Transportation and public utilities ----- do -----	8.4	8.7	9.0	+3.4
Wholesale and retail trade ----- do -----	36.3	39.3	40.6	+3.3
Finance, insurance, real estate ----- do -----	7.0	7.5	7.7	+2.7
Services ----- do -----	40.1	41.6	42.5	+2.2
Government ----- do -----	34.3	35.1	35.5	+1.1
Total nonagricultural employment ----- do -----	178.4	190.6	197.2	+3.5
Personal income:				
Total ----- millions -----	\$2,809.0	\$3,214.0	\$3,589.0	+11.7
Per capita ----- do -----	\$5,827.0	\$6,601.0	\$7,280.0	+10.3
Construction activity:				
Number of private and public residential units authorized -----	2,947.0	¹ 3,566.0	3,176.0	-10.9
Value of nonresidential construction ----- millions -----	\$11.9	\$15.4	\$14.7	-4.6
Value of State road contract awards ----- do -----	\$30.0	\$27.0	\$18.7	-30.7
Shipments of portland and masonry cement to and within the State ----- thousand short tons -----	137.0	154.0	143.0	-7.1
Nonfuel mineral production value:				
Total crude mineral value ----- millions -----	\$41.5	\$47.8	\$54.1	+13.2
Value per capita, resident population ----- do -----	\$86.0	\$98.0	\$110.0	+12.2
Value per square mile ----- do -----	\$4,314.0	\$4,978.0	\$5,634.0	+13.2

^PPreliminary.

¹Series revised in 1978; data not comparable with those of prior years.

Sources: U.S. Department of Commerce, U.S. Department of Labor, Highway and Heavy Construction Magazine, and U.S. Bureau of Mines.

mine, uranium in the State. Some State officials believed that Act 250 controlled exploration and mining for all minerals. At yearend, the Act 250 Environmental Board governing body was developing rules to guide all mineral exploration in the State.

The State geologist's office was the principal agency involved in mineral-related affairs. The major function of this office during 1978-1979 was to serve as advisor-consultant to other departments and agencies of local, State, and regional govern-

ment. During the period, guidelines were developed for mine reclamation; the oil and gas potential of the Champlain basin was assessed; and a number of geological mapping and mineral resource assessment studies were conducted on State lands.

The Vermont Mapping Advisory Committee and the cooperative mapping program between the State and the U.S. Geological Survey were reestablished. The State geologist chairs the Mapping Advisory Commit-

tee.

Vermont continued cooperative programs with the Federal Bureau of Mines to research the use of mine tailings as mineral raw materials. Vermont slate, marble, and asbestos tailings were under investigation. Initial results were favorable for producing insulation from the slate and marble wastes, and a synthetic highway aggregate was produced from asbestos mine tailings.

REVIEW BY NONFUEL MINERAL COMMODITIES

NONMETALS

Asbestos.—Vermont Industrial Products, a subsidiary of Vermont Asbestos Group, Inc., mined asbestos from surface operations near Lowell. Output was used in asbestos cement products.

Cement.—All cement used by the construction industry during the biennium was imported. Vermont and the other New England States, excluding Maine, have no cement-producing plants. Shipments to the State in 1978 totaled 148,000 tons of portland and 6,000 tons of masonry; 1979 shipments were 138,000 tons of portland and 5,000 tons of masonry.

Mica.—Crude mica, imported from foreign sources by the U.S. Samica Corp., Rutland, was used in the manufacture of mica paper for electrical insulation.

Sand and Gravel.—Construction sand and gravel was the second leading commodity in terms of tonnage and value during the

biennium. In 1979, 43 companies produced sand and gravel from 45 deposits, a decrease of 6 companies and 6 deposits from the previous year. Leading counties in tonnage were Chittenden, in the northwestern part of the State, and Bennington, in the southwest. Principal end uses were roadbase, asphalt, and concrete aggregate. Other uses included fill and snow and ice control.

Officials in a number of local Vermont communities expressed concern about Federal Mine Safety and Health Administration (MSHA) regulations governing sand and gravel operations. The communities mine sand and gravel intermittently for road repair, and MSHA requires that part-time employees receive 26 hours of safety training at community expense. At the end of 1979, there were no MSHA-certified instructors in Vermont; the nearest training classes are in Pennsylvania.

Table 4.—Vermont: Construction sand and gravel sold or used, by major use category

Use	1977			1978			1979		
	Quantity (thousand short tons)	Value (thousands)	Value per ton	Quantity (thousand short tons)	Value (thousands)	Value per ton	Quantity (thousand short tons)	Value (thousands)	Value per ton
Concrete aggregate ..	837	\$1,728	\$2.06	1,096	\$2,366	\$2.15	1,006	\$2,108	\$2.10
Plaster and gunite sands	NA	NA	NA	--	--	--	W	W	3.15
Concrete products ...	263	552	2.10	W	W	2.12	W	W	2.67
Asphaltic concrete ...	595	1,183	1.99	469	907	1.93	610	1,321	2.17
Roadbase and coverings	1,162	1,776	1.53	1,301	1,875	1.44	1,136	1,614	1.42
Fill	355	370	1.04	475	569	1.20	563	674	1.20
Snow and ice control ..	NA	NA	NA	143	228	1.59	140	221	1.57
Railroad ballast	W	W	3.31	1	2	1.13	4	10	2.30
Other uses	194	229	1.18	241	489	2.03	201	292	1.45
Total ¹ or average	3,405	5,837	1.71	3,726	6,425	1.72	3,660	6,240	1.70

NA Not available. W Withheld to avoid disclosing company proprietary data; included in "Other uses."

¹Data may not add to totals shown because of independent rounding.

Table 5.—Vermont: Construction sand and gravel sold or used by producers

	1977			1978			1979		
	Quantity (thousand short tons)	Value (thou- sands)	Value per ton	Quantity (thousand short tons)	Value (thou- sands)	Value per ton	Quantity (thousand short tons)	Value (thou- sands)	Value per ton
Sand -----	1,117	\$1,853	\$1.66	1,545	\$2,692	\$1.74	1,715	\$3,054	\$1.78
Gravel -----	2,288	3,984	1.74	2,181	3,734	1.71	1,945	3,186	1.64
Total or average --	3,405	5,837	1.71	3,726	6,425	1.72	3,660	6,240	1.70

¹Data do not add to total shown because of independent rounding.

Stone.—During the biennium, Vermont's stone industry produced crushed limestone, granite, sandstone, marble, unspecified stone (primarily serpentine), dimension granite, marble, and slate. Although output of crushed stone increased approximately 100,000 tons in 1979, the number of quarries decreased by two-thirds. In 1978, 11 quarries crushed limestone and marble; however, no production was reported in 1979. There were 17 active producers of crushed limestone and granite in 1978, but only 11 were in operation the following year. Unspecified stone production decreased from nine quarries to two during the 2 years. Completion of highway projects was a major factor in the closing of a number of operations.

Approximately 70% of the stone produced during the biennium was crushed limestone. In 1979, output totaled 1.5 million tons, 200,000 tons over that produced during the previous year. Limestone, mined and crushed at eight operations in Addison, Crittenden, Frank, and Rutland Counties in the western part of the State, was sold for bituminous aggregate, roadbase, and whitening.

In 1979, there was no reported production of crushed marble or sandstone. However, in 1978, the Vermont State Highway Department crushed marble at two locations in Rutland County, and crushed sandstone at nine quarries in four counties in the eastern and southeastern part of Vermont. The material was used in highway construction for aggregate, roadbase, and fill.

In 1979, unspecified stone, primarily serpentine, was quarried at two locations in Lamoille and Orleans Counties in northern Vermont. Output was sold for aggregate, riprap, and jetty stone.

The crushed stone industry planned to activate three new or inactive quarries; two were opposed by local groups. OMYA, Inc., formerly Vermont Marble Co., planned to open a marble quarry near Brandon.

Stone would be shipped to the company's new marble crushing facility at Florence. The company also planned to reopen an abandoned marble quarry in Florence, which was vehemently opposed by local citizens. The company has owned the mineral rights to the quarry site and surrounding acreage since 1889, and quarried stone until the early 1900's. Citizen opposition stemmed from concern over the effects of blasting on local water wells and dwellings, and of heavy truck traffic on the main road.

Another controversy arose when Pike Industries, Inc., applied for permission to open a limestone quarry on Hale Mountain near Shaftsbury to supply aggregate for 14 miles of new highway. Local residents and environmental groups opposed the plan. The Shaftsbury Zoning Board of Adjusters denied the company a zoning variance, and the company filed a \$4.5 million lawsuit against the community. The suit was dropped when Shaftsbury gave the company permission to mine.

Sto Energy Conservation, Inc., a West German insulation manufacturing company, established its U.S. headquarters in Rutland. The firm will manufacture exterior building insulation from plastic foam and mesh, marble dust, and plaster. Finely ground marble from the OMYA, Inc., plant at Florence will be used in the manufacturing process.

During 1979, the State's dimension stone producers quarried 180,000 tons of stone in seven counties, an increase of approximately 43,000 tons over the previous year's output. Dimension granite accounted for approximately 62% of sales followed by 28% for slate and 10% for marble.

Dimension granite was quarried at seven locations in Orange, Orleans, Washington, and Windsor Counties in northeastern Vermont. The majority of the stone was marketed for rough monumental applica-

tions; the remainder as rough block and finished monuments. Sales in 1979 totaled \$12.7 million, an increase of \$1.2 million over those of 1978.

One granite producer, Rock of Ages Corp., was awarded the U.S. Department of Commerce "E" citation in recognition of "exporting excellence." The company exported about one-sixth of its total sales, primarily to Japan; this amounted to approximately 26,500 tons of granite in 1979.

Dimension slate was quarried at 16 locations in Bennington and Rutland Counties, in southwestern Vermont, in 1979. Output increased significantly over the 19,500 tons

quarried in 1978. Sales of flagging and flooring slate accounted for 88% of the total. The remainder was sold for roofing tile, structural purposes, and house veneer.

One dimension slate operator filed a \$1.7 million suit against the Department of Labor in Federal District Court. In 1978, a quarry wall collapsed, burying mining equipment and vehicles under tons of debris, which the operator contended was due to a Department of Labor, Mine Safety and Health Administration inspector's order to remove overburden from the quarry wall. The wall collapsed a few hours after explosives were used to move the overburden.

Table 6.—Vermont: Dimension stone¹ sold or used by producers, by use

Use	1977			1978			1979		
	Short tons	Cubic feet (thousands)	Value (thousands)	Short tons	Cubic feet (thousands)	Value (thousands)	Short tons	Cubic feet (thousands)	Value (thousands)
Rough stone:									
Rough blocks -----	2,574	29	\$173	3,063	34	\$236	W	W	W
Monumental -----	[†] 78,339	804	8,125	94,325	961	10,843	107,546	1,094	\$12,233
Dressed stone:									
House stone veneer ---	1,550	17	[†] 319	1,550	17	319	1,452	16	317
Monumental -----	W	W	W	W	W	W	4,226	49	1,526
Flagging -----	[†] 10,826	119	387	5,493	60	331	22,574	248	796
Roofing slate (standard)	1,674	18	438	2,142	24	631	4,510	50	1,396
Flooring slate -----	3,885	42	564	10,238	113	1,149	21,646	238	3,787
Other uses ² -----	21,759	245	4,556	19,720	222	4,171	18,278	203	2,950
Total ³ -----	[†] 120,557	1,276	[†] 14,561	136,531	1,431	17,681	180,232	1,898	23,006

[†]Revised. W Withheld to avoid disclosing company proprietary data; included with "Other uses."

¹Includes granite, marble, and slate.

²Includes stone used in irregular-shaped stone, rough flagging, sawed stone, roofing slate (architectural, 1979), structural and sanitary, other rough and dressed stone, and uses indicated by symbol W.

³Data may not add to totals shown because of independent rounding.

Table 7.—Vermont: Crushed stone¹ sold or used by producers, by use

(Thousand short tons and thousand dollars)

Use	1977		1978		1979	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate -----	W	W	67	217	93	304
Bituminous aggregate -----	539	1,482	279	902	430	1,215
Dense-graded roadbase stone -----	545	1,175	72	127	W	W
Other construction aggregate and roadstone -----	265	725	618	1,560	559	1,676
Riprap and jetty stone -----	28	66	25	72	13	45
Railroad ballast -----	W	W	99	361	W	W
Abrasives -----	(²)	1	--	--	--	--
Other fillers or extenders -----	W	W	W	W	32	W
Fill -----	8	16	W	W	--	--
Other uses ³ -----	737	9,169	810	9,938	950	10,687
Total ⁴ -----	2,123	[†] 12,635	1,971	13,178	2,077	13,927

[†]Revised. W Withheld to avoid disclosing company proprietary data; included with "Other uses."

¹Includes limestone, granite, marble (1978), sandstone (1977-78), and other stone.

²Less than 1/2 unit.

³Includes stone used in agricultural limestone, poultry grit, and mineral food (1977); macadam aggregate (1977-78); surface treatment aggregate; filter stone (1978-79); manufactured fine aggregate (stone sand, 1978-79); terrazzo and exposed aggregate; whitening; roofing granules (1977); paper manufacture (1977); unspecified uses; and uses indicated by symbol W.

⁴Data may not add to totals shown because of independent rounding.

Dimension marble was quarried at three operations in Grand Isle County in northwestern Vermont, and Rutland and Windsor Counties in the southern part of the State. Sales were principally for construction and monumental applications.

Vermont dimension stone industries were toured in September 1978 by the National Academy of Science Committee on Surface Mining and Reclamation panel. The panel evaluated the industry for possible extension of the Federal Surface Mining Control and Reclamation Act of 1977, Public Law 95-87, to surface mining of commodities other than coal.

Talc.—During the biennium, Vermont led the Nation in talc production; three companies produced over 660,000 tons valued at over \$5 million. Crude talc was ground and sold for use in toiletry preparations, plastics, rubber, paper, paint, insecticides, asphalt filler, and foundry facings. Vermont Soapstone Co., Perkinsville, mined soapstone, a massive form of talc, for use as lining in wood stoves, griddles, and other heat-related products.

Vermont Talc Co. applied for an exploration permit on a 3-acre tract in Windham. Despite opposition from the Windham Planning Commission, town selectmen, and property owners, the permit was approved and the company removed samples for testing. The company was responsible for site reclamation at the termination of the 3-month permit.

METALS

Exploration for uranium and zinc highlighted metal activity in the State during 1978 and 1979.

Perhaps reflective of an attitude of some citizens of Vermont toward mining in general was the experience of Uran-Gesellschaft, USA, Inc., a West German firm that sought to explore for uranium in southern Vermont. The company leased 2,300 acres; 1,400 were near Jamaica. Other areas leased included Mount Holly, Ludlow, and Townshend. The company planned to drill the Jamaica lease in 1979, but met with opposition from the local citizens and environmental groups. After a series of meetings, marches, and rallies by the opposition, the company withdrew a request to the State for a ruling on whether Act 250, Vermont's Development Control Law, applied to uranium exploration and mining, and moved its exploration effort out of the State.

Labradex, the American subsidiary of Labrador Mining and Exploration Co., Ltd., in Toronto, Canada, purchased options on approximately 1,000 acres in Franklin County for zinc exploration. A town meeting was held and attended by local citizens, the State geologist, and company officials to explain the company's planned exploration activity and its possible effect on the community.

¹State mineral specialist, Bureau of Mines, Pittsburgh, Pa.

²State geologist, Montpelier, Vt.

Table 8.—Principal producers

Commodity and company	Address	Type of activity	County
Asbestos:			
Vermont Asbestos Group, Inc. ¹	Box 70 Hyde Park, VT 05655	Pit	Orleans.
Sand and gravel:			
Burgess Bros., Inc.	Bennington, VT 05201	Pit	Bennington.
Calkins Construction, Inc.	Lyndonville, VT 05851	Pit	Orleans.
S. T. Griswold, Inc.	Williston, VT 05495	Pit	Chittenden.
Hinesburg Sand and Gravel Co.	Hinesburg, VT 05461	Pit	Do.
M & T Sand and Gravel Co.	Swanton, VT 05488	Pit	Franklin.
Stone:			
Granite (dimension):			
Rock of Ages Corp.	Barre, VT 05641	Quarries	Orange, Washington, Windsor.
Wells-Lamson Quarry Co., Inc. ²	----do	Quarry	Washington.
Limestone, dolomite, and marble (crushed, ground, and broken):			
Shelburne Limestone Corp.	30 Jewett St. Shelburne, VT 05482	----do	Chittenden and Franklin.
Vermarco	Proctor, VT 05765	----do	Rutland.
Frank W. Whitcomb Construction Corp.	Box 429 Bellows Falls, VT 05101	----do	Chittenden.

See footnotes at end of table.

Table 8.—Principal producers —Continued

Commodity and company	Address	Type of activity	County
Stone—Continued			
Limestone, dolomite, and marble (crushed, ground, and broken) — Continued			
White Pigment Corp -----	Proctor, VT 05765 -----	Quarries ---	Addison and Rutland.
Marble (dimension):			
Vermont Marble Co. ³ -----	-----do-----	-----do---	Rutland and Windsor.
Slate (dimension):			
John G. Hadeka -----	Poultney, VT 05764 -----	Quarry -----	Rutland.
Hilltop Slate Co -----	Middle Granville, NY 12849	-----do---	Do.
Taran Bros., Inc -----	North Poultney, VT 05764	-----do---	Do.
Tatko Bros. Slate Co -----	-----do-----	-----do---	Do.
Vermont Structural Slate Co., Inc -----	Fair Haven, VT 05743 -----	-----do---	Do.
Talc:			
Eastern Magnesia Talc Co -----	Johnson, VT 05656 -----	Underground mines.	Lamoille.
Vermont Talc, Inc -----	Chester, VT 05143 -----	-----do---	Windham.
Windsor Minerals, Inc -----	Windsor, VT 05089 -----	-----do---	Windsor.

¹Also miscellaneous stone.²Also crushed and broken granite.³Also crushed and broken limestone and dolomite.

