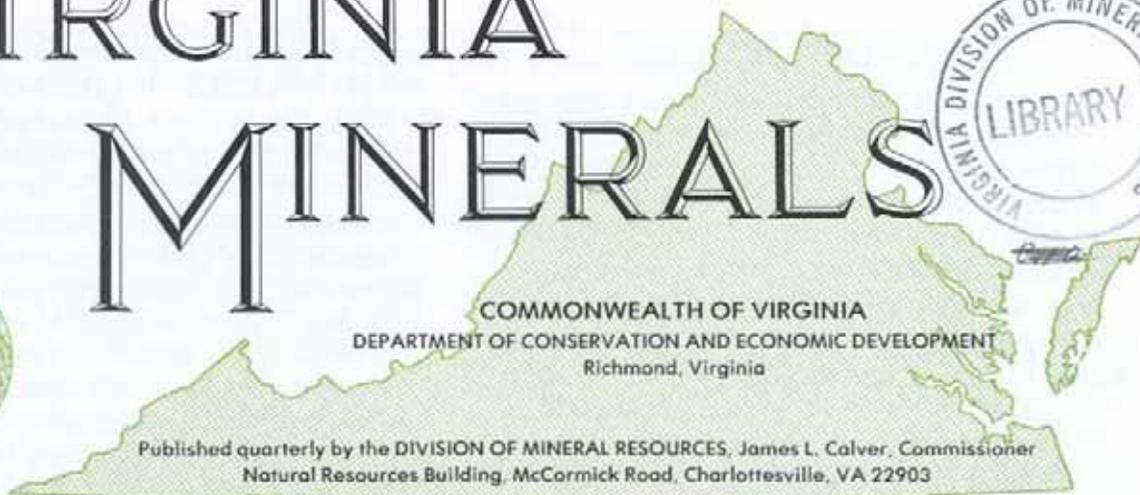
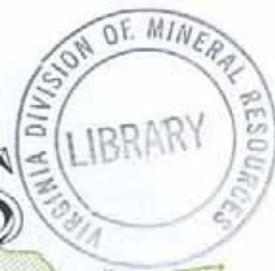


# VIRGINIA MINERALS



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## THE MINERAL INDUSTRY OF VIRGINIA IN 1973<sup>1</sup> ADVANCE SUMMARY

Total value of mineral production in Virginia in 1973 was \$540.6 million, an increase of 10 percent over the \$489.8 million reported in 1972. This was the eleventh consecutive year that mineral values have increased. Of the total value of mineral production, approximately 70 percent was contributed by fuels, 29 percent by nonmetals, and 1 percent by metals.

Production of bituminous coal, the Commonwealth's most valuable commodity, was stable at 33,961 thousand short tons but value increased 10 percent. Natural gas production increased 83 percent and value increased 89 percent. No oil production was reported in 1973.

Stone, the second-ranking commodity in Virginia's mineral economy, increased 10 percent in output and

12 percent in value. Sand and gravel production increased 3 percent and value increased 21 percent. Lime increased approximately 3 percent in output and 4 percent in value. Both masonry and portland cement declined in output while increasing in value. Aplite, clays, and kyanite increased in value; gypsum and soapstone declined in value.

Lead production declined 23 percent and its value declined 17 percent. Zinc production was virtually unchanged but value increased 16 percent. There was no recorded production of titanium concentrates.

<sup>1</sup> Prepared in Division of Fossil Fuels-Mineral Supply, U. S. Bureau of Mines, under a cooperative agreement between the Bureau and the Virginia Division of Mineral Resources.

**Table 1.—Mineral production in Virginia.<sup>1</sup>**

Mineral	1972		1973	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays .....	1,634	\$ 1,783	1,646	\$ 1,886
Coal (bituminous) .....	34,028	344,061	33,961	377,679
Gem stones .....	NA	13	NA	13
Lead (recoverable content of ores, etc.) .....	3,441	1,034	2,637	859
Lime .....	758	11,739	782	12,205
Natural gas .....	2,787	892	5,101	1,688
Petroleum (crude) .....	(2)	(2)	—	—
Sand and gravel .....	14,085	21,696	14,511	26,246
Soapstone .....	W	W	4,600	12
Stone .....	39,986	74,090	43,895	82,719
Zinc (recoverable content of ores, etc.) .....	16,789	5,960	16,683	6,894
Value of items that cannot be disclosed:				
Aplite, cement, gypsum, kyanite, salt (1972), and values indicated by symbol W .....				
Total .....				
	—	28,523	—	30,394
	—	\$489,791	—	\$540,595

NA Not available. W Withheld to avoid disclosing individual company confidential data; included with "Value of items that cannot be disclosed."

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

<sup>2</sup> Less than half a unit.

## NEW PUBLICATIONS

Report of Investigations 35. **GEOLOGY OF THE WOODSTOCK, WOLF GAP, CONICVILLE, AND EDINBURG QUADRANGLES, VIRGINIA**, by Robert S. Young and Eugene K. Rader; 69 p., 4 maps in color, 14 figs., 1 table. Price: \$6.00 (plus 4 percent State sales tax).

The Woodstock, Wolf Gap, Conicville, and Edinburg quadrangles are located in the Valley and Ridge physiographic province in the northern part of the Appalachian Valley of Virginia. Bedrock in the area ranges in age from Middle Cambrian to Late Devonian, but consists principally of Cambrian and Ordovician rocks. With the exception of thin metabentonites in the Oranda the rocks are sedimentary and have a total thickness of approximately 18,500 feet.

Early orogenic deformation resulted in northeastward-trending folds. The major ones, from southeast to northwest across the area are Massanutten synclinorium, Mount Jackson anticline, Harmony syncline, Paddy Mountain anticline, Supin Lick syncline, and Anderson Ridge anticline. Shearing forces, contemporaneous with overturning were localized and the following reverse faults developed: Saumsville, Alonzaville, and North Mountain. The normal faults of the area are late and probably represent relaxation of compression forces following folding.

The mineral resources in the mapped area consist of limestone, dolomite, shale, clay, manganese oxides, iron oxides, and zinc sulfide. Limestone and dolomite for use as crushed stone and agricultural stone have been quarried in the area. Numerous potential quarry sites are available. Shale from the Martinsburg, Marcellus, and Hampshire formations has been tested for potential use in the manufacture of brick and ceramic products. Manganese has been produced from the Ridgeley and Keefer formations in the western upland area. Shows of sphalerite and fluorite have been found, but no economic deposits are known.

Report of Investigations 36. **GEOLOGY OF THE ASHBY GAP QUADRANGLE, VIRGINIA**, by Thomas M. Gathright, II and Paul G. Nystrom, Jr.; 55 p., 1 map in color, 22 figs., 4 tables. Price: \$3.25 (plus 4 percent State sales tax).

The Ashby Gap 7.5-minute quadrangle is located in eastern Clarke, western Loudoun, and northern Fauquier counties in northern Virginia. This area is mainly in the Blue Ridge physiographic province; the southeast and northwest corners of the quadrangle are in the Piedmont and Valley and Ridge physiographic provinces, respectively. Bedrock within the quadrangle

ranges in age from Precambrian to Middle Cambrian and has been assigned to 10 formations that have been divided into members where mappable intraformational units are present. Quaternary terrace deposits and flood-plain alluvium were also mapped.

The structural aspect of the Ashby Gap quadrangle is dominated by gently northeastward-plunging folds that include the Pigeon Hill, Franklinton, Willow Lake, and Taylors Hill synclines and the Calmes Neck and Slate Ridge anticlines. Northward-trending, eastward-dipping, high-angle reverse faults that appear to die out within the quadrangle are present, as well as northwestward-trending vertical faults of relatively small displacement. Most of the rock units are characterized by a southeastward-dipping foliation that parallels the axial planes of the folds. The very low-rank regional metamorphism evident in the more argillaceous rocks appears to be related to the development of this foliation.

Crushed stone for road aggregate and agricultural use has been produced in the quadrangle. Significant quantities of high-magnesium dolomite are present and minor amounts of siliceous iron and traces of copper, lead, and barite occur locally.

Report of Investigations 37. **GEOLOGY OF THE SALEM QUADRANGLE, VIRGINIA**, by Roger V. Amato; 40 p., 1 map in color, 3 figs., 2 tables. Price: \$3.25 (plus 4 percent State sales tax).

The Salem quadrangle is located in Roanoke County, Virginia and is centered around the City of Salem. The quadrangle is underlain by rocks ranging in age from Precambrian to Early Mississippian with an aggregate thickness of at least 12,000 feet. However, these strata do not represent a complete sedimentary sequence as they occur in four imbricated thrust sheets.

The Blue Ridge thrust sheet on the southeast contains Precambrian metamorphic and Lower Cambrian clastic rocks which have been thrust over the Rome Formation. The Max Meadows thrust sheet consists wholly of Lower Cambrian Rome strata which have been tightly squeezed into a series of drag folds. The Salem thrust sheet contains Upper Cambrian Elbrook strata which are also tightly folded. The rocks northwest of the Salem fault range in age from Upper Cambrian to Mississippian. This thrust sheet includes the Catawba syncline and two complementary structures, an anticline and a syncline, to the southeast.

Crushed rock, sand, shale, and building stone have been quarried from the Salem quadrangle, although only shale and sand are currently produced for building materials. Potential mineral resources include sand and gravel, lightweight aggregate, and crushed stone.

## OIL AND GAS DEVELOPMENT IN VIRGINIA DURING 1973<sup>2</sup>

A total of 5,129,289 Mcf (thousand cubic feet) of natural gas was produced in Virginia during 1973, which is an increase of 2,327,376 Mcf from 1972 production. Reported production was from five counties: Buchanan County, 3,161,842 Mcf; Dickenson County, 706,136 Mcf; Russell County, 4,679 Mcf; Tazewell County, 1,251,882 Mcf; and Wise County, 4,750 Mcf. No oil production was reported in Virginia for 1973.

Twenty-two tests were drilled during the year. Columbia Gas Transmission Corporation drilled 18 of these wells in Buchanan and Dickenson Counties with combined footage of 84,155 feet of which 14 had a combined open flow of 20,918 Mcf after fracture of the Berea, Ravenclyffe, Greenbrier (Big Lime), and Devonian shale; two holes were plugged and abandoned, one is scheduled to be plugged, and one was being prepared for refracture at the end of 1973. Four tests were drilled in Dickenson County by Philadelphia Oil Company, a subsidiary of the Equitable Gas Company, bringing the total footage drilled during 1973 to 104,224 feet. All four wells of Philadelphia Oil Company have been completed and shut-in, with a total final open flow of 4,030 Mcf.

Buchanan County became the leading gas producer in Virginia during 1973 with a total of 3,161,842 Mcf as

reported by four operators: Ashland Oil, Inc., 573,410 Mcf; Cabot Corporation, 32,627 Mcf; Columbia Gas Transmission Corporation, 2,504,779 Mcf; and P & S Oil and Gas Corporation, 51,026 Mcf. Four wells were drilled in Buchanan County by Columbia Gas Transmission Corporation with a combined total open flow of 14,110 Mcf. Footage drilled totaled 19,658 feet.

In Dickenson County the Clinchfield Coal Company delivered 389,601 Mcf of gas to lines of the Kentucky-West Virginia Gas Company and used 8,010 Mcf of gas in field operations. Columbia Gas Transmission Corporation produced 308,525 Mcf to give Dickenson a total production of 706,136 Mcf. Fourteen new wells were drilled in Dickenson County by the Columbia Gas Transmission Corporation with a final open flow of 6,808 Mcf; total footage drilled was 64,497 feet. Philadelphia Oil Company drilled four wells whose total footage was 20,069 feet with a final open flow of 4,030 Mcf.

Two operators in Tazewell County produced 1,251,882 Mcf of gas: Columbia Gas Transmission Corporation, 430,517 Mcf, and Consol-Ray Resources, 821,365 Mcf. The Penn Virginia Corporation produced 4,750 Mcf of gas for local use from two wells in Wise County. There was no drilling activity in Russell, Tazewell, or Wise Counties in 1973.

<sup>2</sup> Information supplied by William W. Kelly, Jr., Virginia Division of Mines and Quarries.

Table 2.—Summary of Virginia drilling during 1973.

Operator	Lease	Well No.	Total Depth (feet)	Status
<b>Buchanan County</b>				
Columbia Gas Transmission Corporation	Landen Elswick, et al	9752	5,119	Gas well
"	Anna Marie Rowe	9765	4,299	Gas well
"	The Pittston Co.	9781-T	6,799	Plugged and abandoned
"	Fred Clevinger, et ux	9826-T	3,441	Gas well
<b>Dickenson County</b>				
Columbia Gas Transmission Corporation	The Pittston Co.	9753	4,253	Gas well
"	The Pittston Co.	9754	4,582	Plugged and abandoned (2-12-74)
"	The Pittston Co.	9755	4,412	Gas well
"	The Pittston Co.	9757	4,366	Gas well
"	The Pittston Co.	9758	4,155	Gas well
"	The Pittston Co.	9759	5,356	Gas Well
"	The Pittston Co.	9760	5,604	Gas well
"	The Pittston Co.	9761	4,398	Gas well
"	The Pittston Co.	9762	4,521	Will re-fracture
"	The Pittston Co.	9764	4,530	Gas well
"	The Pittston Co.	9769	4,487	Will plug and abandon
"	The Pittston Co.	9770	4,439	Gas well
"	The Pittston Co.	9834	4,620	Gas well
"	The Pittston Co.	9835	4,774	Gas well
<b>Philadelphia Oil Company</b>				
"	The Pittston Co.	P-1	5,338	Gas well
"	The Pittston Co.	P-3	5,349	Gas well
"	The Pittston Co.	P-6	4,932	Gas well
"	The Pittston Co.	P-7	4,450	Gas well

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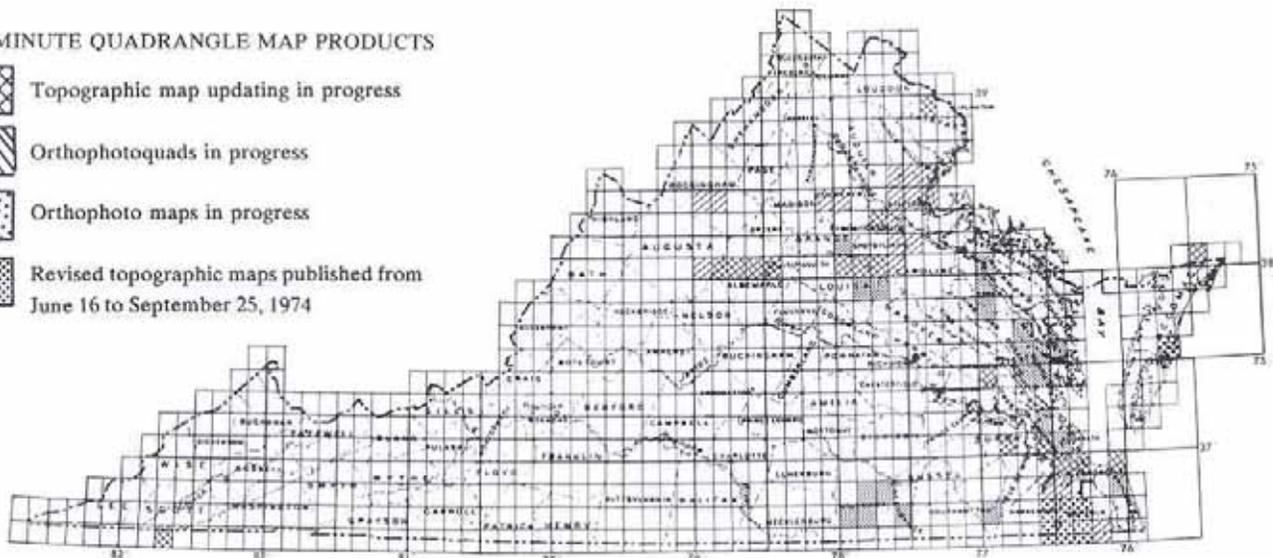
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