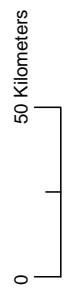
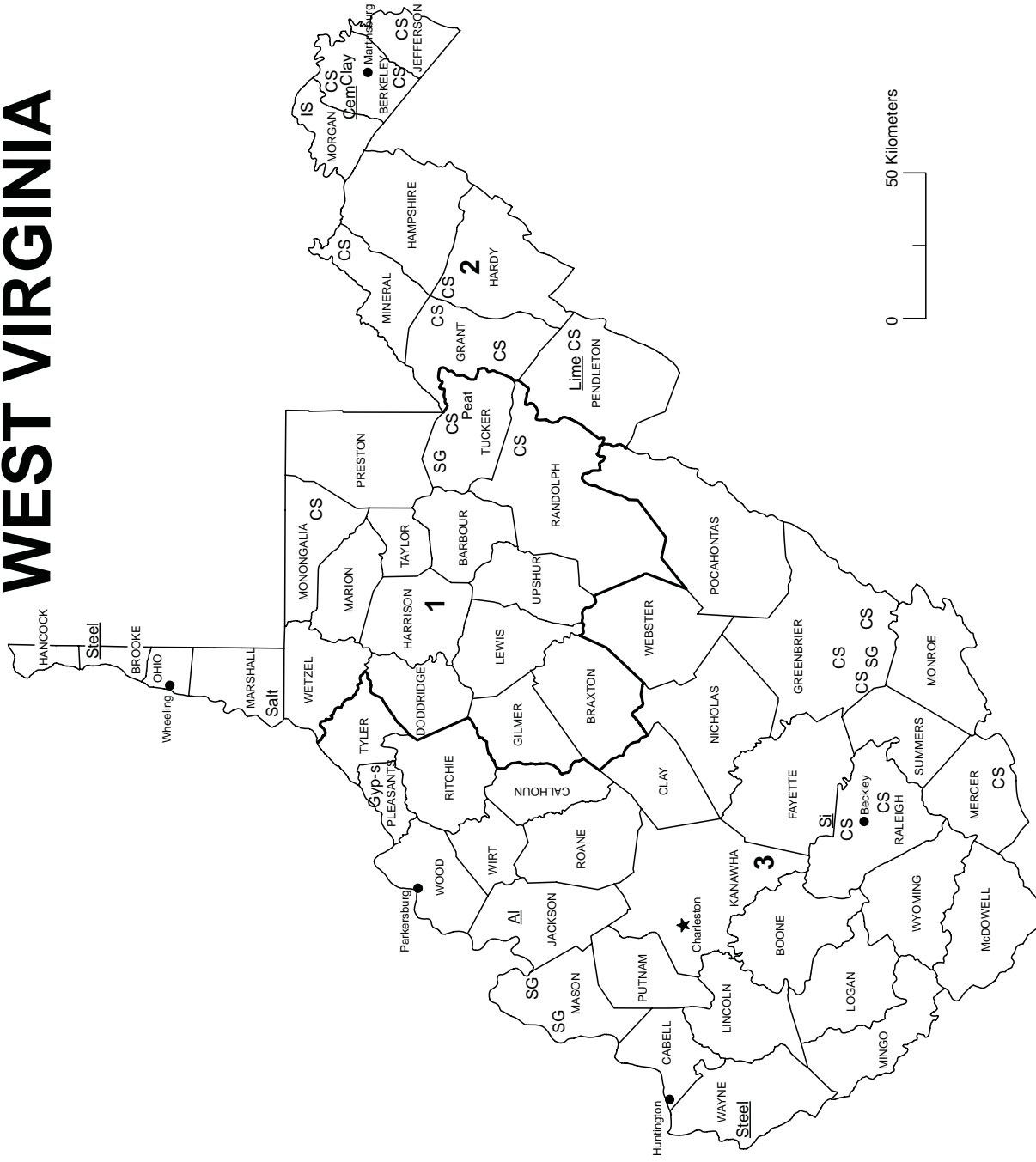




2005 Minerals Yearbook

WEST VIRGINIA

WEST VIRGINIA



LEGEND

- County boundary
- ★ Capital
- City
- 1 — Crushed stone/sand and gravel districts

MINERAL SYMBOLS
(Major producing areas)

- Al Aluminum plant
- Cem Cement plant
- Clay Common clay
- CS Crushed stone
- Gyp-s Synthetic gypsum
- IS Industrial sand
- Lime Lime plant
- Peat Peat
- Salt Salt
- SG Construction sand and gravel
- Si Silicon metal plant
- Steel Steel plant

THE MINERAL INDUSTRY OF WEST VIRGINIA

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

In 2005 West Virginia's nonfuel raw mineral production was valued¹ at \$200 million, based upon annual U.S. Geological Survey (USGS) data. This was up more than 20% from the State's total nonfuel mineral value of \$166 million in 2004, which was up 1.2% from that of 2003.

In 2005, crushed stone continued to be West Virginia's leading nonfuel mineral by value, accounting for nearly 50% of the State's total nonfuel mineral production value. Cement (portland and masonry), industrial sand and gravel, lime, and salt followed (in descending order of value). These five mineral commodities accounted for nearly 99% of the State's total value of nonfuel raw mineral production. In 2005, although crushed stone production decreased slightly, the commodity led in the State's significant increase in value with a 37%, or \$26.8 million increase from that of 2004. The values of portland cement, masonry cement, and lime also rose, each also having small decreases in production. The total increase for cement was about \$5 million and lime increased by nearly \$3 million (table 1).

West Virginia was 10th in 2005 (9th in 2004) in the quantity of salt produced and remained a significant producer of crushed stone, industrial sand and gravel, and lime. The State's mines produced industrial minerals and coal; no metals were mined in West Virginia. Primary aluminum and raw steel were produced in the State, but both metals were processed from materials acquired from foreign and other domestic sources. In 2005, West Virginia ranked 10th in the Nation (9th in 2004) in the production of primary aluminum among 12 producing States.

Industry Trends and Developments

According to the West Virginia Geological and Economic Survey (WVGES), West Virginia's total quarry production in 2005 from nonfuel mineral products—comprised of crushed stone (limestone and sandstone), construction and industrial sand and gravel, shale, and sand limestone—was 16.2 million metric tons (Mt) from 50 permitted quarries. Limestone quarries produced about 14 Mt of various products, accounting for about

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the 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 2005 USGS mineral production data published in this chapter are those available as of December 2006. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>

87% of the total noncoal production based on tonnage. While aggregate, by far, was the largest use for the State's limestone resources, limestone, additionally, was processed for such uses as: agricultural lime and ballast, metallurgical flux, in the production of cement, in steel production, and in flue gas desulfurization, fluidized bed combustion, low silica rock dust for the coal industry, stream revitalization, various chemical applications, and for wastewater treatment (Britton, Blake, and McColloch, 2007, p. 123).

Commodity Review

Industrial Minerals

Crushed Stone.—The majority of West Virginia's limestone production of about 10.3 Mt (based upon WVGES data) was from a northeast-southwest trend in the counties along the eastern border with the State of Virginia. The trend extended northeastward into the State's eastern panhandle along outcrop belts of thick carbonate units of Ordovician, Silurian, Devonian and Mississippian age (spanning an age of from about 480 million years to about 320 million years). The county that produced the most limestone was Monongalia County from which 2.8 Mt of stone was quarried from the Greenbrier Limestone of Mississippian age. In the western portion of the State in Ritchie County (anomalous to the norm of the State's eastern production trend), an underground limestone mine opened from which 592,000 metric tons (t) of stone were extracted; interestingly this source was also the Greenbrier Limestone. Another mine in Harrison County produced 77,000 t of stone from the Upper Pennsylvania Monongahela Formation (Britton, Blake, and McColloch, 2007, p. 123).

Owing to several major highway construction projects, the demand for limestone aggregate was expected to continue to increase. These projects included the Coalfields Expressway in southern West Virginia and the Corridor H project across the east-central mountain portion of the State. Additionally, a number of large construction projects and smaller road projects throughout the State will continue to demand additional aggregate.

Reference Cited

Britton, J.Q., Blake, B.M., Jr., and McColloch, G.H., 2007, West Virginia, in Annual review 2006: Mining Engineering, v. 59, no. 5, May, p. 123-125.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN WEST VIRGINIA^{1,2}

(Thousand metric tons and thousand dollars)

Mineral	2003		2004		2005	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	142	376	161	441	186	524
Gemstones	NA	1	NA	1	NA	1
Sand and gravel:						
Construction	971	4,750	524	2,500	318	1,630
Industrial	W	W	343	17,300	369	17,800
Stone, crushed	14,100	69,100	14,700	72,600 ^r	14,500	99,400
Combined values of cement, lime, peat, salt, stone (dimension sandstone), and value indicated by symbol W	XX	90,100	XX	73,500	XX	81,100
Total	XX	164,000	XX	166,000 ^r	XX	200,000

^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld value included in "Combined values" data. XX Not applicable.

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

²Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2
WEST VIRGINIA: CRUSHED STONE SOLD OR USED, BY KIND¹

Kind	2004			2005		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	28	13,300 ^r	\$66,300 ^r	26	13,200	\$89,800
Sandstone	8	1,400 ^r	6,250 ^r	6	1,260	9,620
Total	XX	14,700	72,600 ^r	XX	14,500	99,400

^rRevised. XX Not applicable.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 3
WEST VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2005, BY USE¹

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Macadam	W	W
Riprap and jetty stone	170	1,370
Filter stone	W	W
Other coarse aggregates	24	233
Total	<u>465</u>	<u>3,650</u>
Coarse aggregate, graded:		
Concrete aggregate, coarse	603	3,870
Bituminous aggregate, coarse	728	5,300
Bituminous surface-treatment aggregate	(2)	(2)
Other graded coarse aggregates	167	1,280
Total	<u>1,500</u>	<u>10,500</u>
Fine aggregate (-¾ inch):		
Stone sand, concrete	273	1,570
Stone sand, bituminous mix or seal	96	590
Screening, undesignated	205	1,530
Total	<u>574</u>	<u>3,690</u>
Coarse and fine aggregate:		
Graded road base or subbase	W	W
Unpaved road surfacing	W	W
Crusher run or fill or waste	208	1,310
Total	1,190	7,460
Other construction materials	850	5,920
Agricultural, limestone	(3)	(3)
Unspecified: ⁴		
Reported	6,270	43,300
Estimated	3,700	25,000
Total	<u>9,920</u>	<u>68,200</u>
Grand total	<u>14,500</u>	<u>99,400</u>

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

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Withheld to avoid disclosing company proprietary data; included with "Other graded coarse aggregates."

³Withheld to avoid disclosing company proprietary data; included in "Unspecified: Reported."

⁴Reported and estimated production without a breakdown by end use.

TABLE 4
WEST VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2005, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) ²	W	W	W	W	W	W
Coarse aggregate, graded ³	W	W	W	W	W	W
Fine aggregate (-¾ inch) ⁴	W	W	W	W	W	W
Coarse and fine aggregate ⁵	W	W	W	W	W	W
Other construction materials	850	5,920	--	--	--	--
Agricultural ⁶	W	W	--	--	W	W
Unspecified: ⁷						
Reported	2,740	18,900	2,580	17,700	942	6,750
Estimated	1,200	8,000	1,700	11,000	813	5,500
Total	5,710	38,800	4,650	31,400	4,140	29,100

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

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregates.

³Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), and other graded coarse aggregates.

⁴Includes screening (undesignated), stone sand (bituminous mix or seal), and stone sand (concrete).

⁵Includes crusher run or fill or waste, graded road base or subbase, and unpaved road surfacing.

⁶Includes agricultural limestone.

⁷Reported and estimated production without a breakdown by end use.