



# 2010–2011 Minerals Yearbook

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VIRGINIA [ADVANCE RELEASE]

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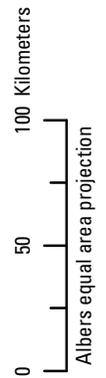
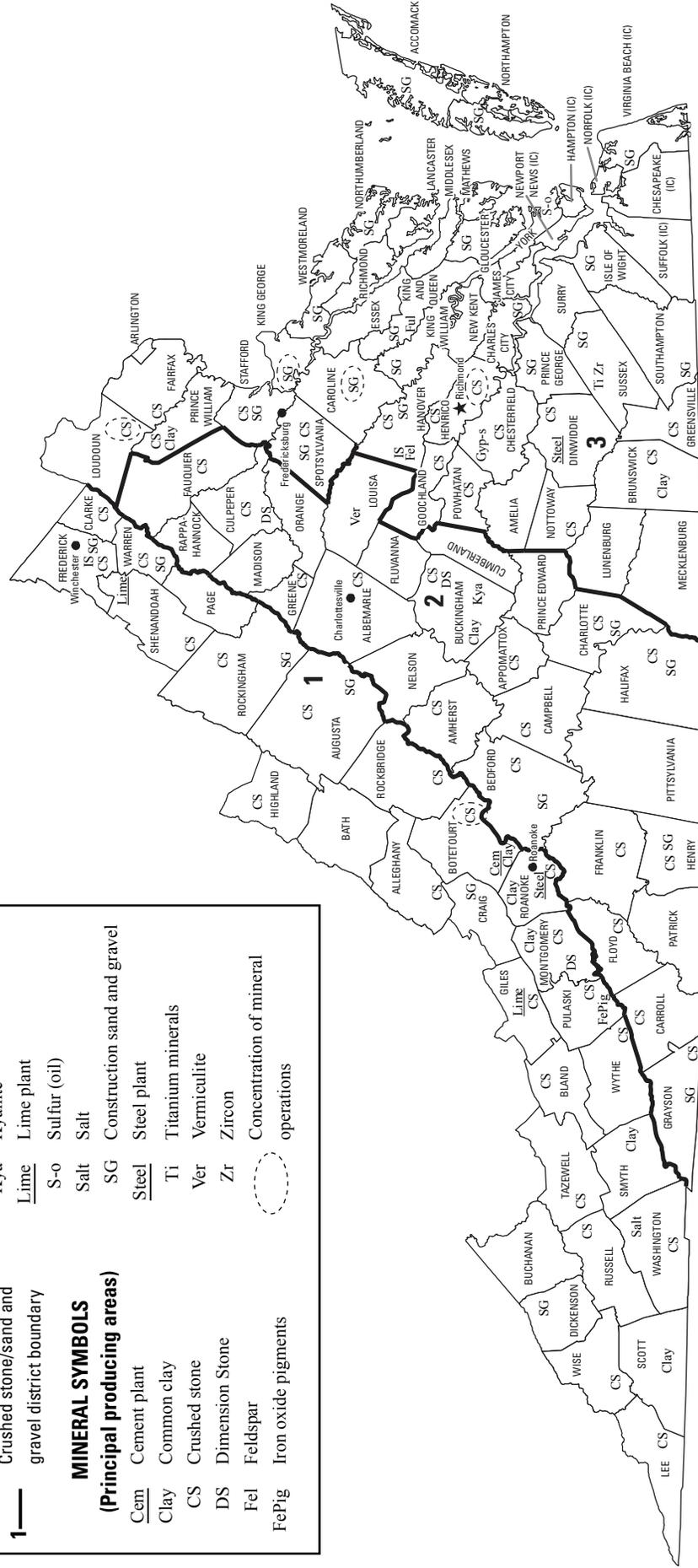
# VIRGINIA

**LEGEND**

- County boundary
- (IC) Independent city
- ★ Capital
- City
- 1— Crushed stone/sand and gravel district boundary

**MINERAL SYMBOLS**  
(Principal producing areas)

- Cem Cement plant
- Clay Common clay
- CS Crushed stone
- DS Dimension Stone
- Fel Feldspar
- FePig Iron oxide pigments
- Ful Fuller's earth
- Gyp-s Synthetic gypsum
- IS Industrial sand
- Kya Kyanite
- Lime Lime plant
- S-o Sulfur (oil)
- Salt Salt
- SG Construction sand and gravel
- Steel Steel plant
- Ti Titanium minerals
- Ver Vermiculite
- Zr Zircon
- Concentration of mineral operations



Source: Virginia Department of Mines, Minerals, and Energy/U.S. Geological Survey (2010–11).

# THE MINERAL INDUSTRY OF VIRGINIA

**This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Virginia Department of Mines, Minerals and Energy for collecting information on all nonfuel minerals.**

In 2011, Virginia's nonfuel mineral production<sup>1</sup> was valued at \$1.19 billion, based upon annual U.S. Geological Survey (USGS) data. This was an increase of \$154 million (nearly 15%) from the State's total nonfuel mineral production value of \$1.03 billion in 2010, which increased \$88 million (9%) from \$947 million in 2009. Virginia rose in rank to 19th in 2011 from 20th in 2010 among the 50 States in total nonfuel mineral production value and accounted for 1.6% of the U.S. total. On a per capita basis, the State ranked 25th with a value of \$147; the national average was \$240.

In 2010 and 2011, crushed stone remained Virginia's leading nonfuel mineral commodity by production value, accounting for almost 60% of the State's total nonfuel mineral value in both years (table 1). The production quantity and production value of crushed stone increased consecutively from 2009 to 2011. The largest increases took place in 2011 with production quantity and production value up by 5.4 million metric tons (Mt) (12%), and by \$107 million (almost 18%), respectively. In 2011, zirconium concentrates became the second-leading nonfuel mineral commodity by production value, after increasing 50% from that of 2010, followed by construction sand and gravel, lime, and portland cement (data withheld for portland cement, lime, and zirconium concentrates—company proprietary data).

In 2011, other mineral commodities that had significant increases in production value were ilmenite, industrial sand and gravel, dimension stone, salt, and montmorillonite (fuller's earth), in decreasing order of production value increases (actual production value withheld—company proprietary data). All

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<sup>1</sup>The 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 USGS mineral production data published in this chapter are those available as of May 2013. Data in this report are rounded to three significant digits and percentages are calculated from unrounded data. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at <http://minerals.usgs.gov/minerals>.

other commodities produced in the State, except kyanite and lime, declined in production value, led by a \$11.7 million (13%) decrease in construction sand and gravel, followed by decreases in portland cement and masonry cement, feldspar, vermiculite, and common clays (actual production values withheld—company proprietary data). Most decreases were modest, with feldspar being the only mineral commodity having a decrease of more than 10% from the previous year.

In 2010, there were significant increases in the production quantities and production values of zirconium concentrates, crushed stone, ilmenite, kyanite, construction sand and gravel, industrial sand and gravel, and dimension stone, in decreasing order of production value increases (production value withheld—company proprietary data). The number of dimension stone producers increased in 2010 and 2011 such that production data could be revealed in table 1, unlike that of 2009. Montmorillonite (fuller's earth), portland cement, vermiculite, masonry cement, and feldspar decreased in production value, in decreasing order of production value increases (production values withheld—company proprietary data). The production quantities of salt and masonry cement decreased by more than 10% in 2010, but the production quantities of montmorillonite and vermiculite increased by more than 15% (production value withheld—company proprietary data).

Virginia continued to be the only U.S. producer of kyanite and ranked first of two titanium-mineral-producing States in 2010 and 2011 for its production of ilmenite. Virginia remained second in feldspar production of seven producing States, second in vermiculite production of two producing States, and third in iron oxide pigment production of three crude pigment producers. The State rose in rank in zirconium production from second to first of two producing States in 2010 and remained first in 2011. From 2009 to 2011, the State rose in rank in fuller's earth, from 4th to 3d of 11 producing States; in crushed stone, from 10th to 5th of 50 producing States; in common clays, from 9th to 8th of 35 producing States; and, in masonry cement, from 10th to 9th of 26 producing States.

TABLE 1  
NONFUEL RAW MINERAL PRODUCTION IN VIRGINIA<sup>1,2</sup>  
(Thousand metric tons and thousand dollars)

Mineral	2009		2010		2011	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	505	5,830	503	6,010	500	6,000
Kyanite	71	21,000 <sup>r</sup>	93	28,000	98	29,400
Sand and gravel, construction	7,230 <sup>r</sup>	82,200 <sup>r</sup>	7,780	89,200	6,670	77,500
Stone:						
Crushed	42,300 <sup>r</sup>	579,000 <sup>r</sup>	44,000	603,000	49,400	711,000
Dimension	W	W	14	3,920	12	7,380
Combined values of cement, clays (fuller's earth), feldspar, gemstones (natural), iron oxide pigments (crude), lime, salt, sand and gravel (industrial), talc [crude (2011)], titanium concentrates (ilmenite), vermiculite (crude), zirconium concentrates, and values indicated by symbol W	XX	260,000	XX	303,000	XX	356,000
Total	XX	947,000 <sup>r</sup>	XX	1,030,000	XX	1,190,000

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined values" data. XX Not applicable.

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

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

TABLE 2  
VIRGINIA: CRUSHED STONE SOLD OR USED IN THE UNITED STATES, BY TYPE<sup>1</sup>

Type	2009			2010			2011			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone <sup>2</sup>	52 <sup>r</sup>	15,400 <sup>r</sup>	\$192,000 <sup>r</sup>	49	15,700	\$203,000	43	14,100	\$195,000	\$13.85
Dolomite	--	--	--	--	--	--	4	1,440	19,800	13.75
Granite	30	17,400	258,000	30	18,300	266,000	31	22,300	334,000	14.94
Traprock	10	7,130	99,400	10	7,460	104,000	11	9,270	134,000	14.42
Sandstone and quartzite <sup>3</sup>	6	1,070	15,200	6	1,280	12,400	6	1,240	13,100	10.61
Slate	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	2	222	3,160	2	59	845	14.44
Miscellaneous stone	8 <sup>r</sup>	1,250 <sup>r</sup>	15,400 <sup>r</sup>	6	1,100	15,000	6	1,010	14,500	14.40
Total or average	XX	42,300 <sup>r</sup>	579,000 <sup>r</sup>	XX	44,000	603,000	XX	49,400	711,000	14.38

<sup>r</sup>Revised. XX Not applicable. -- Zero.

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

<sup>2</sup>Includes limestone-dolomite reported with no distinction between the two kinds of stone.

<sup>3</sup>Includes sandstone-quartzite reported with no distinction between the two kinds of stone.

TABLE 3  
 VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS  
 IN 2010, BY USE<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
<b>Construction:</b>		
Coarse aggregate (+1½ inch):		
Macadam	W	W
Riprap and jetty stone	266	3,980
Filter stone	266	3,560
Other coarse aggregate	944	15,500
Coarse aggregate, graded:		
Concrete aggregate, coarse	868	11,000
Bituminous aggregate, coarse	1,010	13,300
Bituminous surface-treatment aggregate	419	5,700
Railroad ballast	554	5,770
Other graded coarse aggregate	6,300	104,000
Fine aggregate (-¾ inch):		
Stone sand, concrete	480	5,420
Stone sand, bituminous mix or seal	248	3,140
Screening, undesignated	263	2,780
Other fine aggregate	1,970	23,500
Coarse and fine aggregates:		
Graded road base or subbase	1,070	11,600
Unpaved road surface	348	4,050
Crusher run or fill or waste	1,190	12,400
Roofing granules	W	W
Other coarse and fine aggregates	3,830	50,100
Other construction materials	W	W
<b>Agricultural:</b>		
Agricultural, limestone	482	6,710
Other agricultural uses	113	4,880
<b>Chemical and metallurgical:</b>		
Cement manufacture	W	W
Glass manufacture	W	W
<b>Special:</b>		
Mining dusting or acid water treatment	W	W
Other fillers or extenders	W	W
Other miscellaneous uses and specified uses not listed	21	715
<b>Unspecified:<sup>2</sup></b>		
Reported	14,400	197,000
Estimated	8,470	112,000
<b>Total</b>	<b>44,000</b>	<b>603,000</b>

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

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

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

TABLE 4  
 VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS  
 IN 2011, BY USE<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
<b>Construction:</b>		
Coarse aggregate (+1½ inch):		
Macadam	110	926
Riprap and jetty stone	251	4,470
Filter stone	354	5,230
Unspecified coarse aggregate	831	15,500
Coarse aggregate, graded:		
Concrete aggregate, coarse	1,330	17,300
Bituminous aggregate, coarse	1,400	19,800
Bituminous surface-treatment aggregate	413	5,880
Railroad ballast	701	7,450
Unspecified graded coarse aggregate	5,530	96,700
Fine aggregate (-¾ inch):		
Stone sand, concrete	532	7,700
Stone sand, bituminous mix or seal	252	3,580
Screening, undesignated	260	2,720
Unspecified fine aggregate	1,970	28,100
Coarse and fine aggregates:		
Graded road base or subbase	1,660	19,300
Unpaved road surface	234	2,760
Terrazzo and exposed aggregate	11	134
Crusher run or fill or waste	1,200	13,000
Roofing granules	W	W
Unspecified coarse and fine aggregates	4,750	62,100
Unspecified and other construction materials	39	1,020
<b>Agricultural:</b>		
Agricultural, limestone	546	9,490
Unspecified and other agricultural uses	119	5,900
<b>Chemical and metallurgical:</b>		
Cement manufacture	1,130	7,940
Glass manufacture	473	1,560
<b>Special:</b>		
Mining dusting or acid water treatment	W	W
Other fillers or extenders	8	141
Other miscellaneous uses and specified uses not listed	26	747
<b>Unspecified:<sup>2</sup></b>		
Reported	17,000	244,000
Estimated	8,090	113,000
<b>Total</b>	<b>49,400</b>	<b>711,000</b>

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

<sup>1</sup>Data are rounded to no more than three significant digits.

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

TABLE 5  
 VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2010, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) <sup>2</sup>	887	9,800	186	2,880	W	W
Coarse aggregate, graded <sup>3</sup>	2,740	32,700	W	W	W	W
Fine aggregate (-¾ inch) <sup>4</sup>	1,510	18,500	W	W	W	W
Coarse and fine aggregates <sup>5</sup>	2,560	26,300	W	W	W	W
Other construction materials	--	--	W	W	--	--
Agricultural <sup>6</sup>	467	9,440	W	W	W	W
Chemical and metallurgical <sup>7</sup>	W	W	--	--	--	--
Special <sup>8</sup>	W	W	--	--	--	--
Other miscellaneous uses and specified uses not listed <sup>9</sup>	W	W	W	W	--	--
Unspecified: <sup>10</sup>						
Reported	600	8,190	2,750	37,400	11,100	151,000
Estimated	6,460	84,200	2,010	27,600	423	5,780
Total <sup>11</sup>	15,700	205,000	7,460	99,800	21,400	313,000

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

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

<sup>2</sup>Includes macadam, riprap and jetty stone, filter stone, and other coarse aggregates.

<sup>3</sup>Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregates.

<sup>4</sup>Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregates.

<sup>5</sup>Includes graded road base or subbase, unpaved road surface, terrazzo and exposed aggregate, crusher run, roofing granules, and other coarse and fine aggregates.

<sup>6</sup>Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

<sup>7</sup>Includes cement manufacture, lime manufacture, dead-burned dolomite manufacture, flux stone, chemical stone, glass manufacture, and sulfur oxide removal.

<sup>8</sup>Includes mine dusting or acid water treatment, whiting or whitening substance, and other fillers or extenders.

<sup>9</sup>Includes drain fields, waste material, lightweight aggregate (slate), pipe bedding, refractory stone (including ganister), and other miscellaneous uses.

<sup>10</sup>Reported and estimated production without a breakdown by end use.

<sup>11</sup>District totals may not add up to the published State total, owing to revisions made after the production of the table and (or) proprietary data being withheld.

TABLE 6  
 VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2011, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) <sup>2</sup>	773	10,500	179	3,160	W	W
Coarse aggregate, graded <sup>3</sup>	1,870	23,800	W	W	W	W
Fine aggregate (-¾ inch) <sup>4</sup>	1,040	14,400	W	W	W	W
Coarse and fine aggregates <sup>5</sup>	2,810	30,400	1,120	11,900	W	W
Other construction materials	36	950	W	W	--	--
Agricultural <sup>6</sup>	480	12,300	W	W	W	W
Chemical and metallurgical <sup>7</sup>	1,610	9,500	--	--	--	--
Special <sup>8</sup>	W	W	--	--	--	--
Other miscellaneous uses and specified uses not listed <sup>9</sup>	W	W	W	W	--	--
Unspecified: <sup>10</sup>						
Reported	64	922	W	W	W	W
Estimated	6,770	93,700	1,320	19,100	--	--
Total	15,600	212,000	6,680	92,200	27,100	407,000

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

<sup>1</sup>Data are rounded to no more than three significant digits.

<sup>2</sup>Includes macadam, riprap and jetty stone, filter stone, and other coarse aggregates.

<sup>3</sup>Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregates.

<sup>4</sup>Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregates.

<sup>5</sup>Includes graded road base or subbase, unpaved road surface, terrazzo and exposed aggregate, crusher run, roofing granules, and other coarse and fine aggregates.

<sup>6</sup>Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

<sup>7</sup>Includes cement manufacture, lime manufacture, dead-burned dolomite manufacture, flux stone, chemical stone, glass manufacture, and sulfur oxide removal.

<sup>8</sup>Includes mine dusting or acid water treatment, whitening or whitening substance, and other fillers or extenders.

<sup>9</sup>Includes drain fields, waste material, lightweight aggregate (slate), pipe bedding, refractory stone (including ganister), and other miscellaneous uses.

<sup>10</sup>Reported and estimated production without a breakdown by end use.

TABLE 7  
 VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2010,  
 BY MAJOR USE CATEGORY<sup>1</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products <sup>2</sup>	2,090	\$30,400	\$14.55
Asphaltic concrete aggregates and other bituminous mixtures	297	3,390	11.41
Road base and coverings	64	579	9.05
Fill	921	4,180	4.54
Snow and ice control	44	453	10.30
Other miscellaneous uses	197	2,760	14.01
Unspecified: <sup>3</sup>			
Reported	1,190	13,300	11.18
Estimated	2,890	33,200	11.49
Total or average	7,780	89,200	11.47

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

<sup>2</sup>Includes plaster and guniting sands.

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

TABLE 8  
 VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2011,  
 BY MAJOR USE CATEGORY<sup>1</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products <sup>2</sup>	2,030	\$27,300	\$13.45
Asphaltic concrete aggregates and road base materials <sup>3</sup>	667	7,050	10.57
Fill	616	2,630	4.27
Snow and ice control	13	135	10.38
Unspecified: <sup>4</sup>			
Reported	1,830	22,500	12.30
Estimated	1,510	17,900	11.85
Total or average	6,670	77,500	11.62

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

<sup>2</sup>Includes plaster and gunite sands.

<sup>3</sup>Includes road and other stabilization (cement).

<sup>4</sup>Reported and estimated production without a breakdown by end use.

TABLE 9  
 VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2010,  
 BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products	W	W	W	W	1,990	29,100
Fill	4	37	37	169	880	3,970
Other miscellaneous uses <sup>2</sup>	100	1,010	157	1,600	201	2,740
Unspecified: <sup>3</sup>						
Reported	23	267	44	292	1,120	12,800
Estimated	1,080	12,600	--	--	2,050	23,700
Total <sup>4</sup>	1,210	13,900	238	2,060	6,240	72,200

W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses." -- Zero.

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

<sup>2</sup>Includes asphaltic concrete aggregates, road base materials, and snow and ice control.

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

<sup>4</sup>District totals may not add up to the published State total, owing to revisions made after the production of the table and (or) proprietary data being withheld.

TABLE 10  
 VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2011,  
 BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products <sup>2</sup>	W	W	W	W	1,860	25,000
Fill	W	W	W	W	575	2,420
Other miscellaneous uses <sup>3</sup>	237	3,210	259	3,240	358	3,080
Unspecified: <sup>4</sup>						
Reported	95	1,180	17	192	1,720	21,100
Estimated	582	6,890	--	--	928	11,000
Total	1,090	13,600	138	1,260	5,440	62,600

W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses." -- Zero.

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

<sup>2</sup>Includes plaster and gunite sands.

<sup>3</sup>Includes asphaltic concrete aggregates, road base materials (cement), and snow and ice control.

<sup>4</sup>Reported and estimated production without a breakdown by end use.