2012–2013 Minerals Yearbook

FLORIDA [ADVANCE RELEASE]

U.S. Department of the Interior
U.S. Geological Survey

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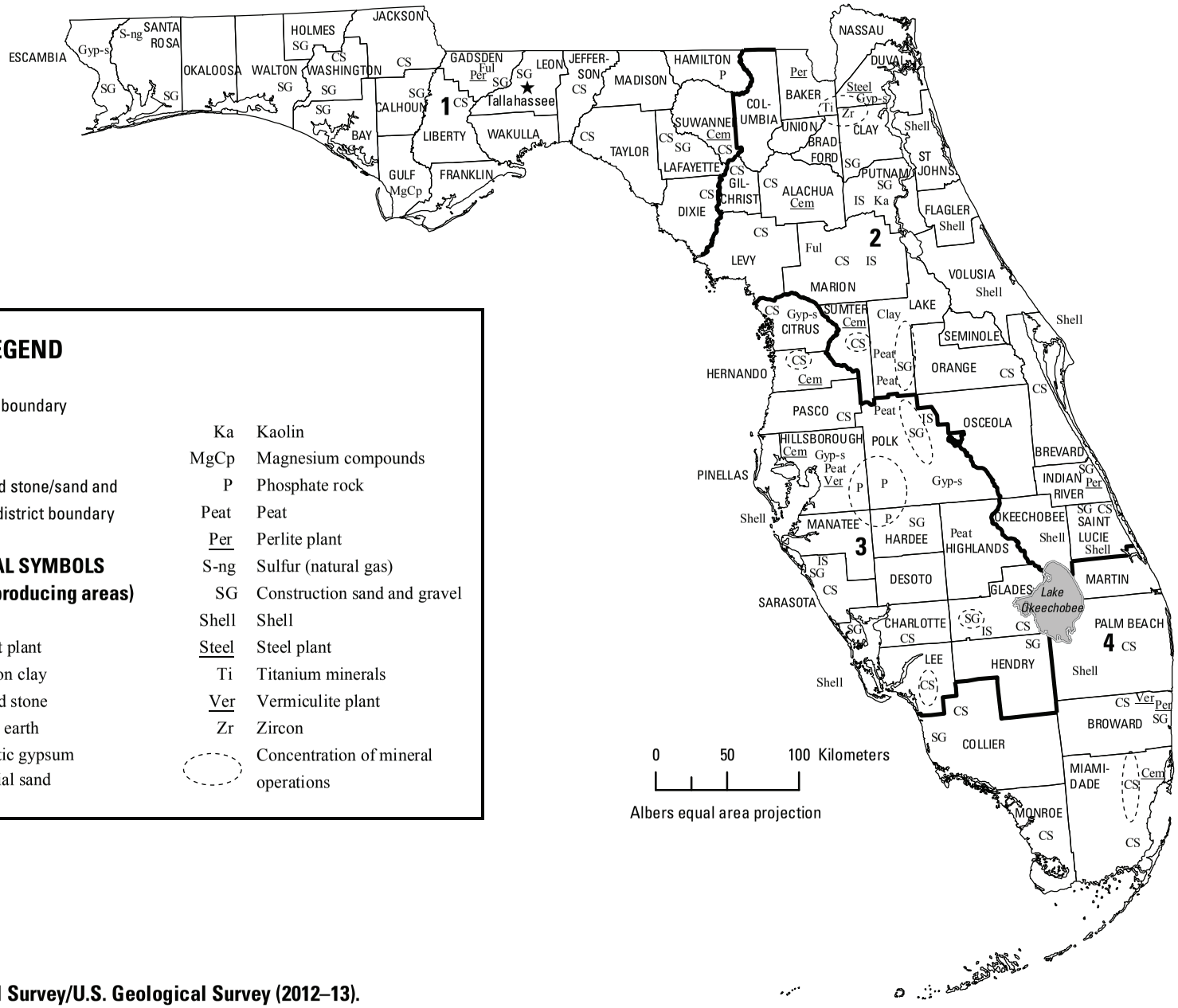
FLORIDA



LEGEND

County boundary

★ Capital

● City

1 Crushed stone/sand and gravel district boundary

MINERAL SYMBOLS
(Principal producing areas)

Cem	Cement plant
Clay	Common clay
CS	Crushed stone
Ful	Fuller's earth
Gyp-s	Synthetic gypsum
IS	Industrial sand
Ka	Kaolin
MgCp	Magnesium compounds
P	Phosphate rock
Peat	Peat
Per	Perlite plant
S-ng	Sulfur (natural gas)
SG	Construction sand and gravel
Shell	Shell
Steel	Steel plant
Ti	Titanium minerals
Ver	Vermiculite plant
Zr	Zircon
	Concentration of mineral operations

Source: Florida Geological Survey/U.S. Geological Survey (2012–13).

The Mineral Industry of Florida

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

In 2013, the value of the nonfuel mineral production[1] in the State of Florida decreased to $3.59 billion, 4.8% of the total U.S. nonfuel mineral production, ranking it sixth in the country. In 2012, the corresponding value was $3.81 billion, 5.1% of the Nation's total nonfuel mineral production, ranking it fourth among the 50 States. In 2013, on a per capita basis, nonfuel mineral production in Florida had a value of $183 compared with the national average of $238. In 2012, the per capita value was $197 compared with the national average of $241.

The value of nonfuel mineral production in Florida for the years 2006 through 2013 was as follows (in billions of dollars): $3.24 (2006), $3.41 (2007), $3.73 (2008), $4.16 (2009), $2.67 (2010), $3.42 (2011), $3.81 (2012), and $3.59 (2013).

In 2013, there were 2,190 employees in nonfuel mineral mines in Florida and 1,588 in mills and preparation plants. In 2012, the corresponding numbers were 2,109 in nonfuel mineral mines and 1,585 in mills and preparation plants (U.S. Mine Safety and Health Administration, 2013, p. 8; 2014, p. 8). In 2013, the average annual wage in Florida for all mining was $63,457 compared with $42,896 for all industries. In 2012, the corresponding figures were $60,779 and $42,441, respectively (National Mining Association, unpub. data, February 4, 2016).

In 2013, on the basis of production quantity, Florida was the only State producing staurolite, and was the leading State for the production of attapulgite, masonry cement, peat, and phosphate rock out of 3, 25, 12, and 4 producing States, respectively. It was second in the production of titanium concentrates (ilmenite) and zirconium concentrates out of two producing States, in each case. The State was fourth in the production of crushed stone and portland cement out of 50 and 34 producing States, respectively.

In 2012, Florida was the only State producing staurolite, and was the leading State in the production of attapulgite, peat, and phosphate rock out of 3, 13, and 4 producing States, respectively. The State was second in the production of masonry cement, titanium concentrates (ilmenite), and zirconium concentrates out of 25, 2, and 2 producing States, respectively. Florida was fifth in the production of portland cement out of 35 producing States.

In 2012 and 2013, the State also produced common clay, construction and industrial sand and gravel, crushed stone, kaolin, lime, montmorillonite, and natural gemstones (table 1).

[1]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 February 2016. 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.

Commodity Review

The Florida Geological Survey[2] (FGS) prepared a report for the mineral industry of the State covering activities in 2012 and 2013 from which the following data have been extracted. These data may differ from U.S. Geological Survey (USGS) data, which are based on company responses to USGS surveys and estimation for nonrespondents. The USGS withheld some data to avoid disclosing company proprietary data.

Most mining operations in Florida require both State and Federal permits and local government approvals. Legal challenges to these often delay commencement of actual mine operations. In 2013, the State issued 12 permits: 5 "limerock," 2 sand, 1 fuller's earth, 3 peat, and 1 phosphate, encompassing 1,092 hectares (ha) (2,698 acres). Mined phosphate land totaled 99,964 ha (247,068 acres), of which 73,106 ha (180,688 acres) had been reclaimed by the end of 2013. Phosphate rock was produced at six mines in Florida, concentrated in the counties of Hamilton, Hardee, Hillsborough, Manatee, and Polk. In 2012, the State issued eight permits: two "limerock," four sand, and two phosphate, encompassing 4,434 ha (10,958 acres).

Industrial Minerals

Mineral industry activity with respect to industrial minerals was as follows:

- December 2013—Iluka Resources Limited (Perth, Western Australia, Australia) and "The Land Planning Group" obtained new permits from the Florida Department of Environmental Protection to conduct reclamation of their titanium and zirconium operations in the Green Cove Springs area. The land remediation was completed 7 years after mining; the company's mining permit was relinquished in December 2013 (Iluka Resources Limited, 2014).
- November 2013—The Mosaic Co. announced it would acquire the phosphate operations of CF Industries Holdings, Inc. in Florida, which included the phosphate rock mine in Hardee County and the phosphoric acid and fertilizer plant in Plant City, Hillsborough County (Green Markets, 2013).
- October 2013—E.I. du Pont de Nemours & Co. announced that it was planning to spin off its performance chemicals business into a new publicly traded company, Chemours, in mid-2015 (Gelles, 2013). DuPont Titanium Technologies was included as a part of that new company. DuPont, through DuPont Titanium Technologies and later Chemours, produced a mixed ilmenite, leucoxene, and rutile product used as a feedstock for titanium dioxide pigments plants and

[2]Daniel C. Phelps, Florida Geological Survey, provided the State nonfuel mineral industry information.

zirconium as joint products of the processing of heavy-mineral sands (Bedinger, 2014; Chemours, 2015).

- August 2013—Oil-Dri Corp. of America acquired the assets of MFM Industries, Inc., which mined fuller's earth in Florida (Oil-Dri Corp. of America, 2014).
- December 2012—Three new phosphate mines under development in Florida were waiting to receive permits to operate (Jasinski, 2015).
- August 2012—The Wild Turkey Sand Mine opened and became the first new mine in Indian River County since a 2008 moratorium on new sand and rock mines in that county. The open pit mining area occupied about 89 ha (about 220 acres) and was expected to operate for 10 years under its current permit.

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TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN FLORIDA[1, 2]

(Thousand metric tons and thousand dollars)

Mineral	2011		2012		2013	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	188	24,800 [e]	225	25,500 [e]	342	42,500 [e]
Portland	3,310	281,000 [r, e]	3,790	313,000 [e]	4,680	402,000 [e]
Clays, common	2	W	2	W	--	--
Gemstones, natural	NA	1	NA	1	NA	1
Peat	494	9,370	356	7,270	338	6,800
Sand and gravel:						
Construction	12,000	104,000	13,700	111,000	15,500	131,000
Industrial	180	4,370	195	5,800	200	10,300
Stone, crushed	40,700 [r]	516,000 [r]	47,100	572,000	52,600	630,000
Combined values of clays (fuller's earth, kaolin), lime, magnesium compounds (2011), phosphate rock, staurolite, titanium concentrates (ilmenite), zirconium concentrates, and values indicated by symbol W	XX	2,480,000	XX	2,780,000	XX	2,370,000
Total	XX	3,420,000 [r]	XX	3,810,000	XX	3,590,000

[e]Estimated. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; included in "Combined values" data.
XX Not applicable. -- Zero.
[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.

TABLE 2
FLORIDA: CRUSHED STONE SOLD OR USED IN THE UNITED STATES, BY TYPE[1]

Type	2012 Number of quarries	2012 Quantity (thousand metric tons)	2012 Value (thousands)	2012 Unit value	2013 Number of quarries	2013 Quantity (thousand metric tons)	2013 Value (thousands)	2013 Unit value
Limestone[2]	78	43,300	$524,000	$12.08	76	51,300	$613,000	$11.93
Dolomite	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Shell	6	3,150	39,800	12.61	5	614	7,060	11.49
Granite	--	457	7,410	16.23	--	478	7,870	16.46
Sandstone and quartzite[4]	2	41	506	12.24	2	83	1,010	12.14
Miscellaneous stone	1	94	1,150	12.24	--	94	1,140	12.13
Total or average	XX	47,100	572,000	12.16	XX	52,600	630,000	11.97

XX Not applicable. -- Zero.

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

[2]Includes limestone-dolomite reported with no distinction between the two kinds of stone.

[3]Withheld to avoid disclosing company proprietary data; included with "Limestone."

[4]Includes sandstone-quartzite reported with no distinction between the two kinds of stone.

TABLE 3
FLORIDA: CRUSHED STONE SOLD OR USED BY PRODUCERS BY USE[1]

Use	2012 Quantity (thousand metric tons)	2012 Value (thousands)	2012 Unit value	2013 Quantity (thousand metric tons)	2013 Value (thousands)	2013 Unit value
Construction:						
Coarse aggregate (+1½ inch):						
Riprap and jetty stone	34	$750	$22.06	62	$1,530	$24.54
Filter stone	42	465	11.08	145	1,380	9.47
Unspecified coarse aggregate	W	W	W	1,170	7,860	6.74
Coarse aggregate, graded:						
Concrete aggregate, coarse	353	5,680	16.10	105	2,150	20.53
Bituminous aggregate, coarse	W	W	W	--	--	--
Bituminous surface-treatment aggregate	--	--	--	W	W	W
Railroad ballast	--	--	--	18	104	5.73
Unspecified graded coarse aggregate	3,740	76,800	20.51	4,940	103,000	20.79
Fine aggregate (-⅜ inch):						
Stone sand, concrete	W	W	W	W	W	W
Stone sand, bituminous mix or seal	W	W	W	--	--	--
Screening, undesignated	93	795	8.55	66	1,070	16.17
Unspecified fine aggregate	W	W	W	4,330	61,100	14.12
Coarse and fine aggregates:						
Graded road base or subbase	4,010	26,800	6.69	2,400	15,100	6.30
Unpaved road surface	W	W	W	67	455	6.77
Terrazzo and exposed aggregate	3	19	6.33	--	--	--
Crusher run or fill or waste	951	5,350	5.62	829	4,890	5.90
Unspecified coarse and fine aggregates	6,560	60,600	9.24	6,090	48,000	7.88
Unspecified and other construction materials	40	420	10.50	73	424	5.77
Agricultural:						
Agricultural Limestone	228	1,830	8.04	546	4,420	8.10
Unspecified and other agricultural uses	--	--	--	W	W	W
Chemical and metallurgical:						
Cement manufacture	W	W	W	W	W	W
Lime manufacture	--	--	--	568	6,340	11.17
Sulfur oxide removal	486	10,700	22.04	W	W	W
Other miscellaneous uses and specified uses not listed						
Unspecified:[2]						
Reported	12,700	170,000	13.38	16,900	218,000	12.91
Estimated	11,600	141,000	12.14	12,100	140,000	11.60
Total or average	47,100	572,000	12.16	52,600	630,000	11.97

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

[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.

TABLE 4

FLORIDA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2012, BY USE AND DISTRICT[1]

(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 (-⅜ inch)[4]	W	W	W	W	W	W
Coarse and fine aggregates[5]	448	4,110	3,220	22,100	W	W
Other construction materials	--	--	40	420	--	--
Agricultural[6]	W	W	--	--	W	W
Chemical and metallurgical[7]	--	--	W	W	W	W
Special	--	--	--	--	--	--
Other miscellaneous uses and specified uses not listed	--	--	--	--	--	--
Unspecified:[8]						
Reported	1,830	29,600	914	14,800	3,050	40,200
Estimated	3,000	36,400	1,360	15,900	3,390	41,200
Total	5,770	81,500	7,220	79,800	12,100	135,000

Use	District 4		Unspecified district	
	Quantity	Value	Quantity	Value
Construction:				
Coarse aggregate (+1½ inch)[2]	606	4,650	--	--
Coarse aggregate, graded[3]	2,750	53,800	--	--
Fine aggregate (-⅜ inch)[4]	3,110	44,900	--	--
Coarse and fine aggregates[5]	4,770	40,000	--	--
Other construction materials	--	--	--	--
Agricultural[6]	--	--	--	--
Chemical and metallurgical[7]	--	--	--	--
Special	--	--	--	--
Other miscellaneous uses and specified uses not listed	--	--	--	--
Unspecified:[8]				
Reported	6,910	85,200	--	--
Estimated	3,790	46,400	94	1,150
Total	21,900	275,000	94	1,150

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

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

[2]Includes macadam, riprap and jetty stone, filter stone, and unspecified coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), and unspecified graded coarse aggregate.

[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and unspecified fine aggregate.

[5]Includes graded road base or subbase, unpaved road surface, terrazzo and exposed aggregate, crusher run, and unspecified coarse and fine aggregates.

[6]Includes agricultural limestone.

[7]Includes cement manufacture and sulfur oxide removal.

[8]Reported and estimated production without a breakdown by end use.

TABLE 5

FLORIDA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2013, BY USE AND DISTRICT[1]

(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	11	395	99	738
Coarse aggregate, graded[3]	W	W	W	W	W	W
Fine aggregate (-⅜ inch)[4]	W	W	W	W	W	W
Coarse and fine aggregates[5]	759	6,640	2,100	12,900	1,380	10,000
Other construction materials	--	--	72	378	W	W
Agricultural[6]	W	W	W	W	W	W
Chemical and metallurgical[7]	--	--	1,670	16,100	W	W
Special	--	--	--	--	--	--
Other miscellaneous uses and specified uses not listed	--	--	--	--	--	--
Unspecified:[8]						
Reported	1,910	31,500	1,560	27,100	4,850	53,900
Estimated	2,250	27,300	1,680	15,900	2,250	26,300
Total	5,800	80,400	7,780	90,200	12,200	138,000

Use	District 4		Unspecified district	
	Quantity	Value	Quantity	Value
Construction:				
Coarse aggregate (+1½ inch)[2]	1,250	9,070	--	--
Coarse aggregate, graded[3]	W	W	--	--
Fine aggregate (-⅜ inch)[4]	W	W	--	--
Coarse and fine aggregates[5]	W	W	--	--
Other construction materials	--	--	--	--
Agricultural[6]	--	--	--	--
Chemical and metallurgical[7]	--	--	--	--
Special	--	--	--	--
Other miscellaneous uses and specified uses not listed	--	--	--	--
Unspecified:[8]				
Reported	8,570	106,000	--	--
Estimated	5,830	69,700	94	1,140
Total	26,700	320,000	94	1,140

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

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

[2]Includes macadam, riprap and jetty stone, filter stone, and unspecified coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), and unspecified graded coarse aggregate.

[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and unspecified fine aggregate.

[5]Includes graded road base or subbase, unpaved road surface, terrazzo and exposed aggregate, crusher run, and unspecified coarse and fine aggregates.

[6]Includes agricultural limestone.

[7]Includes cement manufacture and sulfur oxide removal.

[8]Reported and estimated production without a breakdown by end use.

TABLE 6
FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2012,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	3,220	$31,000	$9.63
Plaster and gunite sands	37	469	12.68
Concrete products (blocks, bricks, pipe, decorative, and so forth)	55	584	10.62
Asphaltic concrete aggregates and road base materials[2]	143	990	6.92
Fill	1,280	3,900	3.05
Other miscellaneous uses[3]	468	4,100	8.76
Unspecified:[4]			
Reported	3,830	31,600	8.25
Estimated	4,690	38,400	8.19
Total or average	13,700	111,000	8.10

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes road and other stabilization (lime).
[3]Includes filtration and golf course.
[4]Reported and estimated production without a breakdown by end use.

TABLE 7
FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2013,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	3,050	$32,100	$10.53
Plaster and gunite sands	305	2,070	6.77
Asphaltic concrete aggregates and road base materials[2]	201	1,740	8.66
Fill	802	2,390	2.98
Filtration	31	321	10.35
Other miscellaneous uses	38	400	10.53
Unspecified:[3]			
Reported	4,620	39,500	8.56
Estimated	6,420	52,000	8.10
Total or average	15,500	131,000	8.44

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes road and other stabilization (lime).
[3]Reported and estimated production without a breakdown by end use.

TABLE 8

FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2012, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	W	W	W	W
Asphaltic concrete aggregates and road base materials	W	W	W	W
Fill	268	740	154	601
Other miscellaneous uses[4]	3	27	89	997
Unspecified:[5]				
Reported	--	--	--	--
Estimated	1,090	8,930	1,230	10,000
Total	1,870	14,100	2,790	26,500
Use	**District 3**		**District 4**	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	W	W	W	W
Asphaltic concrete aggregates and road base materials	W	W	W	W
Fill	29	91	832	2,470
Other miscellaneous uses[4]	275	2,020	102	1,050
Unspecified:[5]				
Reported	3,830	31,600	--	--
Estimated	2,370	19,400	--	--
Total	7,410	61,800	1,640	8,640

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

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

[2]Includes plaster and gunite sands.

[3]Includes road and other stabilization (lime).

[4]Includes filtration and golf course.

[5]Reported and estimated production without a breakdown by end use.

TABLE 9

FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2013, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	W	W	W	W
Asphaltic concrete aggregates and road base materials[3]	W	W	W	W
Fill	345	1,200	343	884
Other miscellaneous uses[4]	5	47	64	674
Unspecified:[5]				
Reported	10	100	253	2,390
Estimated	1,470	12,900	1,220	10,500
Total	1,960	15,200	3,600	34,100
Use	**District 3**		**District 4**	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	W	W	W	W
Asphaltic concrete aggregates and road base materials[3]	W	W	W	W
Fill	66	196	48	106
Other miscellaneous uses[4]	--	--	--	--
Unspecified:[5]				
Reported	4,350	37,000	--	--
Estimated	2,690	24,300	1,040	4,380
Total	8,250	72,700	1,660	8,520

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

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

[2]Includes plaster and gunite sands.

[3]Includes road and other stabilization (lime).

[4]Includes filtration.

[5]Reported and estimated production without a breakdown by end use.