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VERMICULITE

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VERMICULITE

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In 2012, production of vermiculite concentrate decreased by more than 10%, although reportable production remained at an estimated 100,000 metric tons (t), because data are rounded to the nearest 100,000 t to avoid disclosing company proprietary data. Worldwide vermiculite production was about 380,000 t in 2012, an 8% decrease from that of 2011. About 60,000 t of exfoliated vermiculite was sold or used in the United States in 2012, down from 64,000 t in 2011. U.S. exports of vermiculite were estimated to be about 2,000 t, about the same as in 2011, and imports were estimated to be 57,000 t, an increase of 7% from that of 2011 and about 16% more than the average imports of the previous 5 years (tables 1, 3, and 4).

Production

Vermiculite is a hydrated magnesium-aluminum-iron silicate; flakes of raw vermiculite concentrate are mica-like in appearance, contain water molecules within their internal structure, and range in color from black to various shades of brown to yellow. When the flakes are heated rapidly to a temperature of 900 °C or higher, the water flashes into steam, and the flakes expand into accordion-like particles, which are gold or bronze in color. This expansion process is called exfoliation, and the resulting lightweight material is chemically inert, fire resistant, and odorless. Two U.S. producers accounted for all domestic crude vermiculite production. Virginia Vermiculite LLC mined and processed vermiculite concentrate at its operation in Louisa County, VA, and Grace Specialty Vermiculite (a subsidiary of W.R. Grace & Co.) did the same at its operations at Enoree and Woodruff, SC. Domestic production (sold or used) data for vermiculite were collected by the U.S. Geological Survey (USGS) from two voluntary canvasses. Of two companies that mined and processed vermiculite ore into a concentrate, one company responded to that survey. Of the 18 exfoliation facilities, eleven responded to the canvass, representing about 64% of the 2012 production tonnages (tables 1, 3), up from slightly less than 50% of the production tonnages from the same number of respondents in 2011. Production data for nonrespondents in each survey were estimated based upon previous years' reported production levels.

Vermiculite concentrate was shipped to exfoliating plants for conversion into the expanded lightweight products. The resulting output of about 60,000 t of exfoliated vermiculite sold or used by producers was valued at about $44 million in 2012. Although output decreased by about 6% from 64,000 t in 2011, the average unit value increased by about 11% in 2012 (table 1). Exfoliated vermiculite, from domestic and imported vermiculite concentrate, was produced by 15 companies operating 18 plants in 11 States (table 2). Of the 18 exfoliation plants, 11 responded to the annual canvass, representing 64% of the estimated sold or used exfoliated vermiculite tonnages listed in tables 1 and 3. States that produced exfoliated vermiculite were, in descending order of estimated output sold or used, South Carolina, New Jersey, Pennsylvania, Florida, Massachusetts, Illinois, Arizona, Arkansas, Ohio, New Mexico, and Texas.

Consumption

Vermiculite has a wide range of uses because of its various attributes, including fire resistance, low thermal conductivity, high liquid absorption capacity, inertness, and low density (table 3). In lightweight aggregate applications, vermiculite is used in general building plasters and concrete products for its lightweight and thermal insulation properties. It may be used alone or combined with other lightweight aggregates, such as perlite. Special plasters include fire protection and soundproofing through products in which vermiculite is combined with a binder, such as gypsum or portland cement, fillers, and specialized additives (Roskill Information Services Ltd., 2004, p. 103). Vermiculite can absorb liquids, such as fertilizers, herbicides, and insecticides, which can then be transported as free-flowing solids.

As insulation, exfoliated vermiculite, sometimes treated with a water repellent, is used to fill pores and cavities in masonry construction and hollow blockwork to enhance acoustic properties, fire rating, and insulation performance. Finer grades of exfoliated vermiculite, combined with potassium or sodium silicate, are used to produce insulation shapes. The ability of vermiculite-base insulation shapes to resist attack by molten aluminum makes them especially useful as secondary insulation in the aluminum production process (Roskill Information Services Ltd., 2004, p. 112).

In horticulture, exfoliated vermiculite improves soil aeration and moisture retention. When mixed with peat or other composted materials, such as pine bark, vermiculite produces a product well suited as a growing medium for plants. As a soil conditioner, exfoliated vermiculite can improve the aeration of "sticky" soils (containing clay) and the water-retention characteristics of sandy soils. This allows for improved watering and reduces the likelihood of compaction, cracking, and crusting of the soil. Vermiculite is used in the fertilizer and pesticide markets because of its ability to act as a bulking agent, carrier, and extender (Roskill Information Services Ltd., 2004, p. 108–109).

Other uses include refractory-insulation gunning and castable mixes and vermiculite dispersions. Finer grades of exfoliated vermiculite are used to partially replace asbestos in brake linings, primarily for the automotive market (Roskill Information Services Ltd., 2004, p. 112–113).

Prices

Published prices for vermiculite serve only as a general guide because of variations in application, quantity, source, and other factors. U.S. domestic prices for vermiculite concentrate, ex-plant, largely dependent on grade sizing, ranged from $145 to $525 per metric ton in 2012, an increase from 2011 prices that ranged from $115 to $460 per ton. The value of imports into the United States in 2012, mostly coarser grades, f.o.b. (free on board) barge Gulf Coast port, ranged from $440 to $900 per ton (Moeller, 2012, 2013). Coarser grained vermiculite, with greater thermal expansion, commands a higher price, but virtually none is produced in the United States.

The average unit value of U.S. exfoliated vermiculite sold or used by producers, using actual and estimated data, was about $749 per ton in 2012, an 11% increase from $672 per ton in 2011; this unit value includes exfoliated vermiculite produced from U.S. and imported concentrate (table 1).

Foreign Trade

Trade data for vermiculite concentrate are not collected as a separate category by the U.S. Census Bureau but are included within the category "vermiculite, perlite, and chlorite, unexpanded" under Harmonized Tariff Schedule of the United States code 2530.10.0000. Trade data in this report are from PIERS, a U.S. trade database compiled by the Journal of Commerce (United Business Media Global Trade, 2013). Total U.S. exports of vermiculite in 2012 were 1,800 t, with the United Kingdom receiving 66%; Italy and Colombia, about 5% each; and Israel, Honduras, and the Netherlands, about 4% each, with the remainder to several other countries. Total U.S. imports of vermiculite—crude, concentrate, and exfoliated—(excluding any material from Canada and Mexico) were estimated to be about 57,000 t, the majority coming from South Africa, 47%; Brazil, 30%; and China, 21%. Concentrates of coarser particle size from higher yielding deposits, which have been increasingly in short supply in recent years, are imported mostly from China and South Africa.

World Review

Vermiculite production decreased by 8% globally in 2012 to 380,000 t (table 4), mainly owing to a significant decrease in production by the world's leading producer, Palabora Mining Co. Ltd. (a subsidiary of Rio Tinto plc) in South Africa. Production increases at Basil Minerios Ltd.'s vermiculite mines in Brazil and Gulf Industrials Ltd.'s Namekara Mine in Uganda were less than expected. Although mines and prospects in Brazil, South Africa, and Uganda might increase the availability of medium to coarser grades, expected production increases in 2012, especially of coarser grades, did not materialize. After mid-year, prices for finer grades tended to decrease slightly in Europe where demand declined mostly owing to a continued sluggishness in the region's construction industry. Coarser and more expensive grades, increasingly in higher demand in recent years, continued to be in short supply (Palabora Mining Co. Ltd., 2013, p. 51). Imerys Industrial Minerals closed its Australian Vermiculite Industries Pty. Ltd. Mud Tank Mine in Western Australia and conducted intermittent mining operations at Samrec Vermiculite Ltd.'s Shawa Mine, in Shawa, Zimbabwe (Moeller, 2013).

Brazil.—In 2011, Brasil Minérios Ltd. had an annual production capacity of nearly 70,000 t of vermiculite at its São Luís De Montes Belos Mine near Goiânia in central Brazil. The company exported 60% of its product, with 40% going to North America. With reserves estimated at 1.2 million metric tons (Mt) of vermiculite ore, the company increased production capacity to 80,000 metric tons per year (t/yr) of vermiculite in 2012 (Elliott, 2011b, c, d; 2012b; Moeller, 2013).

Near Brasília in Catalão, Goiás State, Brasil Minérios owned the mining rights to vermiculite deposits containing estimated vermiculite ore reserves of 2 Mt (Elliott, 2011b). The company planned to begin production at the Catalão Mine and reach production capacity of 20,000 t/yr in 2013 and 100,000 t/yr in 2016, bringing Brasil Minérios' total production capacity, including the São Luís Mine, to 200,000 t/yr in 2016 (Elliott, 2011c; 2012a, b). Brasil Minérios expected to meet the domestic and export demand for vermiculite for 50 years. Brasil Minérios has two exfoliation plants—one in Sanclerlândia, Goiás State, and another in Cosmopolis, Sao Paulo State—with combined installed capacity of 15,000 cubic meters per month (Brasil Minérios Ltd., 2013).

China.—Imerys' (Paris, France) Xinjiang Yuli Xinlong Vermiculite Co. Ltd., which reopened in late 2011, ramped up operations at the company's Xinlong Mine (Xinjiang Province) following the curtailment of vermiculite mining during 2010 as part of an Imerys group restructuring (Elliott, 2012b). The company's leading product was a scale-shaped flake vermiculite concentrate ranging in size from 0.3 millimeter to 8.0 millimeters. The company exported most of its products, but also sold domestically. With an annual production capacity of 120,000 t vermiculite concentrate, Xinjiang Yuli Xinlong Vermiculite reported production of about 80,000 t of vermiculite concentrate in 2011 and was expected to increase production to 100,000 t in 2012, although other sources estimated vermiculite production in China to be much lower. The company also was able to produce 30,000 cubic meters per month of exfoliated vermiculite (Elliott, 2011d; Xinjiang Yuli Xinlong Vermiculite Co., Ltd., 2013).

South Africa.—In 2012, South Africa was the world's leading producer and exporter of vermiculite, accounting for about 37% of estimated world production. From 2000 to 2011, on average, 89% of the vermiculite produced in South Africa was exported (Directorate Mineral Economics, 2012, p. 18).

From its mine in Limpopo Province, Palabora Mining Co. Ltd. managed the world's largest vermiculite operations. Palabora Mining reported 133,000 t of vermiculite concentrate production in 2012, 19% less than that of 2011, and sales of 115,000 t, 29% less than that of 2011. Decreased sales were the result of increased competition in the global vermiculite market, including competition in the South American market, and reduced demand in Europe, which was affected significantly by the European debt crisis. The company reduced prices to maintain market share. Owing to grade constraints and lower recovery rates from the vermiculite ore body, Palabora's

vermiculite product has continued to shift toward the fine and superfine grades (Palabora Mining Co. Ltd., 2013, p. 51, 149). Production of all grades of vermiculite at Palabora's current South African deposit has decreased, and production of sufficient quantities of coarse-grained grades to meet the substantially increasing world demand has become increasingly challenging for the company (Elliott, 2011c).

Palabora reported a net loss of $11 million for its South African copper and vermiculite business in 2012. With a combined 75% company stake, Rio Tinto (58%) and Anglo American plc (17%) announced an agreement to sell Palabora Mining to a consortium of South African and Chinese private and parastatal companies, led by Chinese Hebei Iron and Steel Group and the Industrial Development Corp. of South Africa Ltd. In 2013, Rio Tinto completed the sale of its stake for $373 million (Lismore and Bariyo, 2013). Based upon the company's latest exploration of properties adjacent to or nearby the company's vermiculite mine operations, Palabora had recently determined that it could double annual vermiculite production and extend mine life (Elliott, 2012a).

Uganda.—Gulf Industrials Ltd. (Sydney, Australia), slowed by abnormally wet weather and electric supply difficulties during the first 4 months of the year, operated at a reduced rate at its 30,000 t/yr Namekara Vermiculite Project in the Manafwa district of eastern Uganda. At midyear, the company achieved a production rate of 22,000 t/yr, having completed plant expansion and improvements, including a new drier, magnetic separator, and standby generator. Shortly thereafter, the operation reduced production to 18,000 t/yr before ceasing production altogether on October 25, when it placed the mine on care and maintenance owing to poor market conditions. Although no vermiculite was produced, removal of overburden continued (Gulf Industrials Ltd., 2012, 2013).

The Namekara deposit has about 55 Mt of inferred resources—including significant quantities of coarse and medium grades of about 30% each—and has sufficient resources to operate for more than 50 years at planned rates of production (Elliott, 2011a; Gulf Industrials Ltd., 2011, p. 2–4).

United Kingdom.—In January, industrial trials commenced on e2v technologies plc's first commercial field installation of its ProWave™ microwave processing system for the exfoliation of vermiculite concentrate at Silvaperl (a product division of William Sinclair Holdings PLC). The initial 6-month trial included the supplying of Silvaperl's customers with the vermiculite they ordered, while simultaneously processing vermiculite concentrates from most major sources worldwide to identify the system requirements and modifications needed to optimally process vermiculite of varying grain sizes and contaminant and water content (Fernandez, 2012).

Outlook

Exploration and development of vermiculite deposits containing medium grade to premium coarse grades (mostly in China and South Africa) are likely to continue to be driven by the increasing demand for these larger grades. During the next several years, operations in Brazil and Uganda are expected to help maintain regional and global supplies, mostly medium grade to small grades from Brazil and higher percentages of medium grade to premium coarse grades from Uganda (Elliott, 2012b). The Namekara Mine is expected to reopen in 2013–14, contingent upon improvements in demand from the European (construction) market and completion of upgrades to the Uganda and Kenya rail transportation system to provide Gulf Industrials with quicker and more cost-effective transportation to market (Uganda Radio Network, 2013).

Although increased demand and tight supplies for coarser grades of vermiculite continued globally, prices for vermiculite, which stabilized somewhat in 2012 following the price hikes of 2011, were expected to be mixed through 2014. After an easing of the oversupply of finer grades in 2012, in part owing to the decreased production in South Africa and the less-than-expected production in Uganda, prices for those grades may stabilize in the near term.

With supplies of finer grades far exceeding coarse grades, producers will continue to look for more ways to use finer grades in existing products, such as fireproofing, insulation, and brake pads. Product lines may be developed for new uses, such as micron-sized grades of vermiculite to absorb mine water or to replace zeolite in ion-exchange columns. Innovative approaches to existing technologies, such as Brazil Minérios Ltd.'s unique hybrid wash screen-dry winnower, hold promise for high-quality, cost-effective improvements in processing vermiculite concentrate using conventional technologies (Elliott, 2012b; Moeller, 2013).

Owing to the energy-intensive process associated with the exfoliation of vermiculite in traditional blast furnaces, prices for exfoliated vermiculite are likely to continue to be affected by the volatility of natural gas costs (Elliott, 2012b). Because up to 8% of vermiculite is not fully exfoliated in traditional blast furnace processing, new technologies, such as the new microwave technology for processing vermiculite, which has a more consistent heating of all the vermiculite flakes, could increase yield and substantially reduce the energy needed to exfoliate vermiculite concentrate. Successful development of microwave technology could alter the way that vermiculite is exfoliated worldwide (Moeller, 2012).

Continued growth in the global economy is expected, particularly in developing countries and in regions where the construction industry is recovering more quickly. Coupled with the International Monetary Fund's (2013, p. 2) forecast for U.S. economic growth of 1.8% and 2.8% in 2013 and 2014, respectively, and global economic growth of 3.5% and 3.8% in 2013 and 2014, respectively, U.S. and world production and sales of vermiculite may increase similarly in 2013 and 2014.

References Cited

Brasil Minérios Ltd., 2013, Empresa: St. Oeste, Goiânia, Brasil, Brasil Minérios Ltd. (Accessed August 28, 2013, via http://www.brasilminerios.com.br/expansores.htm.)

Directorate Mineral Economics, 2012, B1 stat tables 2012—Table 36—Production and sales of vermiculite: Pretoria, South Africa, Republic of South Africa Department of Mineral Resources, Minerals Statistical Tables 1990–2011, November 30, 19 p. (Accessed July 17, 2013, via http://www.dmr.gov.za/publications/summary/149-statistics/761-b1-stat-tables-2012.html.)

Elliott, Jack, 2011a, Gulf Industrials to "regenerate" European vermiculite supply: Industrial Minerals, no. 526, July, p. 18–19.

Elliott, Jack, 2011b, Minérios ahead of schedule with vermiculite expansion: Industrial Minerals, no. 530, November, p. 13.
Elliott, Jack, 2011c, Palabora feels squeeze from diminishing vermiculite resource: Industrial Minerals, no. 524, May, p. 11.
Elliott, Jack, 2011d, Year in review 2011—Vermiculite: Industrial Minerals, December 27. (Accessed September 25, 2012, via http://www.indmin.com.)
Elliott, Jack, 2012a, Palabora undertakes study to double vermiculite production: Industrial Minerals, January 16. (Accessed January 17, 2012, via http://www.indmin.com.)
Elliott, Jack, 2012b, Vermiculite's green shoots: Industrial Minerals, no. 539, August, p. 41–44.
Fernandez, Anthony, 2012, Progress update & latest results—Prowave vermiculite processing system: Chelmsford, United Kingdom, e2v technologies plc., 18 p. (Accessed September 16, 2013, via https://www.google.com/search?sourceid=navclient&ie=UTF-8&rlz=1T4MXGB_enUS545US546&q=Progress+update+%26+latest+results%E2%80%94Prowave+vermiculite+processing+system&safe=active.)
Gulf Industrials Ltd., 2011, 2011 annual report: Sydney, New South Wales, Australia, Gulf Industrials Ltd., 52 p. (Accessed August 13, 2013, via http://gulfindustrials.com.au/investor-relations/annual-reports/.)
Gulf Industrials Ltd., 2012, 2012 annual report: Sydney, New South Wales, Australia, Gulf Industrials Ltd., 64 p. (Accessed August 13, 2013, via http://gulfindustrials.com.au/investor-relations/annual-reports/.)
Gulf Industrials Ltd., 2013, Third quarter activities review: Sydney, New South Wales, Australia, Gulf Industrials Ltd., April 30, 64 p. (Accessed August 13, 2013, at http://gulfindustrials.com.au/2013/05/30-april-third-quarter-activities-review/.)
International Monetary Fund, 2013, Growing pains: Washington, DC, International Monetary Fund, World Economic Outlook Update, July 9, 3 p. (Accessed July 11, 2013, at http://www.imf.org/external/pubs/ft/weo/2013/update/02/.)
Lismore, Siobhan, and Bariyo, Allan, 2013, Rio Tinto sells stake in Palabora: Industrial Minerals, no. 544, January, p. 10.
Moeller, Eric, 2012, Vermiculite: Mining Engineering, v. 64, no. 6, June, p. 100–101.
Moeller, Eric, 2013, Vermiculite: Mining Engineering, v. 65, no. 7, July, p. 113–114.
Palabora Mining Co. Ltd., 2013, Integrated annual report 2012: Limpopo, South Africa, Palabora Mining Co., Ltd., 162 p. (Accessed July 17, 2013, at http://www.palabora.com/documents/annual_report_2012.pdf.)
Roskill Information Services Ltd., 2004, The economics of vermiculite (8th ed.): London, United Kingdom, Roskill Information Services Ltd., 126 p. plus appendix.
Uganda Radio Network, 2013, Uganda's vermiculite mines to re-open in July: Kampala, Uganda, Uganda Radio Network, March 16. (Accessed August 28, 2013, at http://ugandaradionetwork.com/a/story.php?s=50781.)
United Business Media Global Trade, 2013, PIERS: Newark, NJ, United Business Media Global Trade. (Accessed July 24, 2013, via http://i.piers.com/Login.aspx?ReturnUrl=/app/Default.aspx.)
Xinjiang Yuli Xinlong Vermiculite Co., Ltd., 2013, About us: Korla, Xinjiang, China, Xinjiang Yuli Xinlong Vermiculite Co., Ltd. (Accessed August 28, 2013, at http://www.xinlongvermiculite.com/en/about.aspx.)

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

Historical Statistics for Mineral and Material Commodities in the United States, Data Series 140.
Lightweight Aggregates. Ch. in United States Mineral Resources, Professional Paper 820, 1973.
Vermiculite. Ch. in Mineral Commodity Summaries, annual.

Other

Vermiculite. Ch. in Industrial Minerals and Rocks (7th ed.), Society for Mining, Metallurgy, and Exploration, Inc., 2006.
Vermiculite. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.
Vermiculite Association, The.

TABLE 1
SALIENT VERMICULITE STATISTICS[1]

(Thousand metric tons and thousand dollars unless otherwise specified)

		2008	2009	2010	2011	2012
United States:						
Production, concentrate[e, 2, 3]		100	100	100	100	100
Exfoliated:[e]						
Quantity		82	64 [r]	66 [r]	64 [r]	60
Value[e]		40,100	33,600	41,200	42,900	44,400
Average value[e, 4]	dollars per metric ton	489	609 [r]	626 [r]	672 [r]	749
Exports[e]		5	3	2	2	2
Imports for consumption[5]		73	39	29	53	57
World, production		413 [r]	409 [r]	417 [r]	412 [r]	380 [e]

[e]Estimated. [r]Revised.

[1]Data are rounded to no more than three significant digits unless otherwise specified.

[2]Sold or used by producers.

[3]Rounded to the nearest 100,000 metric tons to avoid disclosing company proprietary data.

[4]Based on rounded data.

[5]Source: PIERS.

TABLE 2
ACTIVE VERMICULITE EXFOLIATION PLANTS IN THE UNITED STATES IN 2012

Company	County	State
Isolatek International Inc.	Sussex	New Jersey.
J.P. Austin Associates Inc.	Beaver	Pennsylvania.
Palmetto Vermiculite Co. Inc.	Spartanburg	South Carolina.
P.V.P. Industries, Inc.	Trumbull	Ohio.
Schundler Co., The	Middlesex	New Jersey.
Southwest Vermiculite Co., Inc.	Bernalillo	New Mexico.
Specialty Vermiculite Corp.	Maricopa	Arizona.
Do.	Broward	Florida.
Do.	Laurens	South Carolina.
Sun Gro Horticulture Canada Ltd.	Jefferson	Arkansas.
Do.	LaSalle	Illinois.
Thermal Ceramics Inc.	Macoupin	Do.
Therm-O-Rock East, Inc.	Washington	Pennsylvania.
Therm-O-Rock West, Inc.	Maricopa	Arizona.
Verlite Co.	Hillsborough	Florida.
Vermiculite Industrial Corp.	Allegheny	Pennsylvania.
Vermiculite Products Inc.	Harris	Texas.
Whittemore Co., Inc.	Essex	Massachusetts.

Do. Ditto.

TABLE 3
ESTIMATED EXFOLIATED VERMICULITE SOLD OR USED IN THE UNITED STATES, BY END USE[1]

(Metric tons)

	2011	2012
Aggregates[2]	10,600 r	9,870
Insulation[3]	2,900 r	3,260
Agricultural:		
Horticultural	19,600 r	20,000
Soil conditioning	10,300 r	10,100
Fertilizer carrier	W	W
Total	W	W
Other[4]	W	W
Grand total[5]	64,000 r	60,000

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Grand total."

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

[2]Includes concrete, plaster, and premixes (acoustic insulation, fireproofing, and texturizing uses).

[3]Includes loose-fill, block, and other (high-temperature and packing insulation and sealants).

[4]Includes various industrial and other unspecified uses.

[5]Rounded to two significant digits because of estimated data.

TABLE 4

VERMICULITE: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country	2008	2009	2010	2011	2012[e]
Argentina	1,813	2,150	2,500 [r]	1,000 [r]	1,000
Australia[3]	NA [r]	NA [r]	NA [r]	NA [r]	NA
Brazil, concentrate	32,503	50,438	49,976	55,000 [r]	50,000 [p]
Bulgaria[e]	--	--	3,000	15,000 [r]	18,600
China[e]	12,000 [r]	12,000 [r]	15,000 [r]	15,000 [r]	15,000
Egypt	7,560	4,500	2,865 [r]	3,000 [r]	3,000
India[e]	11,742 [4]	12,000	12,000	13,000	13,000
Japan[e]	6,000	6,000	6,000	6,000	6,000
Kenya	320	315	395	515 [r]	520
Russia[e]	25,000	25,000	25,000	25,000	25,000
South Africa	199,764	193,334	199,285	170,571 [r]	140,000
Uganda	-- [r]	-- [r]	1,121 [r]	7,960 [r]	8,000
United States, concentrate, sold and used by producers[e, 5]	100,000	100,000	100,000	100,000	100,000
Zimbabwe	16,123	3,211	-- [r]	-- [r]	--
Total	413,000 [r]	409,000 [r]	417,000 [r]	412,000 [r]	380,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. -- Zero.

[1]World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes data available through July 17, 2014.

[3]Australia produced vermiculite, but available information is inadequate for the formulation of reliable estimates.

[4]Reported figure.

[5]Rounded to one significant digit to avoid disclosing company proprietary data.