



2014 Minerals Yearbook

BARITE [ADVANCE RELEASE]

BARITE

By Michele E. McRae

Domestic survey data and tables were prepared by Raymond I. Eldridge III, statistical assistant, and the world production table was prepared by Lisa D. Miller, international data coordinator.

In 2014, primary U.S. barite production (sold or used by producers) was 663,000 metric tons (t) valued at an estimated \$88.6 million, and apparent consumption was 3.21 million metric tons (Mt). Imports for consumption were 2.70 Mt and exports were 153,000 t (table 1). World barite production was estimated to be 9.15 Mt. Exploration and development of barite resources continued, especially in parts of Africa, Asia, Mexico, and the United States.

The United States was the world's fourth-leading producer of barite and the leading consumer. Continued strong demand for barite was driven by global production of natural gas and petroleum products. Drilling activity remained strong in the United States owing to advances in the application of horizontal drilling and hydraulic fracturing in the production of oil and gas from shale and other low permeability formations ("tight" reservoirs). Annual average rig counts, historically a good indicator of barite consumption, increased by 5% worldwide and by 6% in the United States, in 2014 (Baker Hughes Inc., 2015).

Barite is the mineralogical name for barium sulfate. In commerce, the mineral is sometimes referred to as barytes. In this report, the term primary barite refers to the first marketable product, which includes crude barite that usually has undergone simple beneficiation processes, such as jigging, tabling, and washing, or more complex processes, such as flotation, heavy-media separation, or magnetic separation. Most barite ores require some upgrading to minimum commercial purity or density levels. The primary use of barite is as a weighting agent in drilling muds.

Production

Domestic production and sales data for barite were derived from voluntary responses to the U.S. Geological Survey (USGS) canvass. In 2014, data were received from four of the five operating barite mines, representing approximately 98% of domestic barite sold or sent to company grinding mills. Data were received from 15 of the 22 grinding mills that operated during the year, representing 68% of the quantity of ground barite sold. Estimates for nonrespondents (mine and grinding mills) were made using company production estimates, prior-year data, and other industry data. Of the canvassed operating mines, four were in Nevada and one was in Georgia.

In 2014, the leading companies that mined and ground barite in the United States were also major oil service companies. Information on the mines and mills can be found in table 2. Crude barite production was 663,000 t in 2014, a decrease of 8% compared with that of 2013. The bulk of mine production was from Nevada, with a small quantity from Georgia. The estimated value of domestic production was \$88.6 million (table 1). Only one of the Nevada barite producers sold crude

or run-of-mine ore, making estimation of the value of the crude barite problematic.

M-I SWACO LLC received a water pollution control permit for the Mountain Springs Mine and gravity separation facility in Lander County, NV. The mine, which began operation in 1951, had been on care-and-maintenance status since it last operated in 1986. The mine is estimated to contain more than 1.3 Mt of barite and consists of two pits, a fines stockpile, a screen feed stockpile, and a feed stockpile. Onsite beneficiation facilities consist of a crushing and screening plant, a jig plant for gravity separation, and a sediment pond. Crude barite produced at the mine was to be shipped to the company's Battle Mountain grinding facility for final processing and shipment to end users. Production was expected to begin in the spring of 2015 (Kuczynski, 2014, p. 1–2, 8–9).

There were 22 grinding mills that ground barite all or part of the year. Most Nevada barite ore was ground at nearby company-owned grinding mills. Some run-of-mine ore or crude barite from Nevada was shipped to Canada for grinding.

In addition to the 4 grinding mills in Nevada, 13 grinding mills operated along the coast of the Gulf of Mexico (5 in Louisiana and 8 in Texas). These stand-alone grinding mills processed imported crude barite that was primarily ground to American Petroleum Institute (API) specifications for the oil and gas drilling market, although some was ground for other uses. An additional five grinding mills in the Midwest and Southeast ground barite for use as extenders, fillers, and pigments, and also produced API-grade barite for the oil and gas drilling market.

Halliburton Co. completed construction of a new barite processing plant in Dunphy, NV. The plant was built to process barite from the company's Rossi Mine and consists of two Williams mills capable of grinding 90 tons of barite per hour and an automated packaging system. Processed material can be shipped via rail or truck (Mouat Co. Inc., The, undated).

Environment

Common impurities in drilling-grade barite include quartz, chert, dolomite, siderite, and metallic oxide and sulfide compounds. These are normally insoluble and, as a result, standards limiting their concentrations have not been developed. In addition, the API standard does not address heavy-metal impurities, but barite derived from base-metal deposits may contain heavy metals such as cadmium and mercury, and discharges of these may be regulated under environmental laws. For example, U.S. environmental regulations pertaining to offshore drilling allow drilling waste discharges containing barite only if the barite contains less than 3 parts per million (ppm) cadmium and 1 ppm mercury (Drilling Waste Management Information System, undated).

Consumption

In 2014, apparent consumption of barite increased by 16% to 3.21 Mt compared with that in 2013 (table 1). U.S. sales of ground barite decreased by 4% to 3.41 Mt from 3.55 Mt in 2013. Sales in Louisiana decreased for the second consecutive year in 2014, by approximately 6% to 1.05 Mt, and those in Texas decreased slightly to 1.26 Mt compared with 1.27 Mt in 2013. Sales by grinding mills in all other States decreased by 5% to 1.10 Mt (table 3); however, this followed a 32% increase in 2013. About 3.32 Mt, or 97%, of barite sales from domestic crushers and grinders was for natural gas and petroleum well-drilling markets, and the remaining 3% was for industrial end uses. In 2014, sales of domestic and imported barite for industrial uses decreased by 19% to 92,000 t (table 4).

Barite's role in the well-drilling industry is primarily as a weighting agent in drilling muds to suppress high formation pressures and to prevent blowouts. As a well is drilled, the bit passes through various formations, each with different characteristics. Deeper wells require more barite as a percentage of the total mud mix. An additional benefit of barite is that it does not interfere with magnetic measurements taken in the borehole, either during logging-while-drilling or in separate drill-hole logging.

The color of barite used for drilling petroleum varies and can be black, blue, brown, buff, or gray. However, most barite needs to be ground to a small uniform size, based on specifications set by the API, before it is used as a weighting agent in drilling mud.

The most important characteristic of barite used in drilling mud is its specific gravity (SG) and, until 2010, the API specification called for a minimum SG of 4.2. After concerns in the United States about dwindling reserves of 4.2-SG barite, the API issued a new edition of API Specification 13A, Specification for Drilling Fluids Materials, adding specifications for 4.1-SG barite (effective date, August 1, 2010). Aside from specific gravity, other specifications for 4.1-SG barite are the same as 4.2-SG barite. They require that the barite be finely ground so that at least 97% of the material, by weight, can pass through a 200-mesh (Tyler) [75-micrometer (μm)] screen, and no more than 30%, by weight, can be less than 6 μm , effective diameter, which is measured using sedimentation techniques. Lastly, the ground barite may contain a maximum of no more than 250 milligrams per kilogram of water-soluble alkaline earth metals such as calcium (American Petroleum Institute, 2010, p. 13–23, 83–96).

Since the adoption of the 4.1-SG specification, 4.1-SG and sub-4.1-SG barite have gained widespread acceptance in the U.S. drilling industry. Increasingly considered 'premium' material, 4.2-SG barite is combined with lower specific gravity barite to create blends tailored for specific applications (Newcaster, 2015). Within the barite industry, the term 'grade' increasingly refers to barite of differing SG, as opposed to indicating purity as is common with many other commodities. Although higher SG barite typically contains a higher percentage of barite, the presence of certain impurities can also raise the SG of lower purity material. Because neither the USGS barite canvass nor the Harmonized Tariff Schedule of the United States used in trade data differentiate between barite products

of differing SG, little information is available about the relative proportion of differing SG of barite being used.

Industrial end uses, such as barium chemicals, filler in paint and plastics, and powder coatings, require the barite to be ground to a small uniform size. The size depends on the use; for paint- and plastic-grade material, it averages about 2 to 3 μm . Barite-containing materials were used for sound reduction in engine compartments in automobiles, boats, and trucks. Barite was also used in the base coat of automobile finishes for smoothness and corrosion resistance and continued to be used in friction products for automobiles and trucks.

Barite used as an aggregate in "heavy" concrete or radiation-shielding concrete is crushed and screened to sizes ranging from 4.75 millimeters to 3.75 centimeters for the coarse grade. New Riverside Ochre Co. (Cartersville, GA) was the leading supplier of barite aggregate.

Transportation

In recent years, about 75% to 80% of U.S. barite consumption has been supplied by imports. Most barite imports are shipped in handymax-size bulk carriers (typically 35,000- to 60,000-t deadweight tonnage). After being ground to API specifications, barite is transferred directly to containers on barges docked in canals, lakes, and rivers near the grinding mills for bulk delivery to offshore drilling platforms. These nearshore barite staging locations also are convenient to the clusters of onshore areas with significant petroleum production in the Petroleum Administration for Defense (PAD) District 3, mostly in the Gulf Coast region. The PAD Districts were World War II divisions of the oil-producing areas of the United States; these designations continue to be used.

Prices

Because very little primary barite was sold by domestic barite mining companies, value data for primary barite were to a large extent estimated. The average estimated sales value for primary barite from mines and their associated beneficiation plants in the United States was \$134 per metric ton (table 1).

Value data for ground barite, as reported to the USGS, do not necessarily represent open market prices. Because many of the U.S. barite grinding mills are owned by oil service companies, barite often is sold to the customer at a reduced price or at cost because the barite is simply a small part of the overall service contract. Taking this into account, compared with those of 2013, the average unit value for barite ground in Louisiana increased by about \$16 per ton to \$191 per ton, the average unit value for all grades ground in Texas decreased by \$4 per ton to \$183 per ton. The average unit value of barite ground in other States increased by \$35 per ton to \$199 per ton (table 3), although a portion of that increase may not be an actual cost increase, but rather the result of a change in methodology for estimating the value of domestically mined barite. The average unit value of barite for barium chemicals, fillers and extenders, and glass increased by \$47 to \$438 per ton in 2014 (table 4).

The 2014 yearend price for barite from China, API grade, lump, including cost, insurance, and freight (c.i.f.), U.S. Gulf Coast, was \$145 to \$160 per ton, compared with \$147 to

\$154 per ton as reported in 2013. The import price for barite from India, API grade, lump, c.i.f., U.S. Gulf Coast, remained mostly unchanged at \$158 to \$171 per ton. The import price of chemical-grade barite from China, c.i.f., U.S. Gulf Coast, was unchanged at \$161 to \$180 per ton, and paint-grade barite from China, lump, c.i.f., U.S. Gulf Coast, was \$235 to \$275 per ton. Unground lump, API bulk, SG 4.20, free-on-board barite from Morocco was \$115 to \$127 per ton compared with \$105 to \$130 per ton at yearend 2013 (Industrial Minerals, 2014b).

Foreign Trade

In 2014, barite exports were 153,000 t (table 5), a 23% decrease compared with those in 2013. A significant portion was likely re-exports of imported barite ground in the United States. Canada and Mexico combined accounted for approximately 82% of exports. In the past 10 years, exports to Canada typically constituted more than 80% of total exports. Mexico, the second-leading recipient of U.S. exports, typically accounted for less than 10%. Beginning in 2012, however, exports to Mexico increased sharply, and in 2014 more than 30% of U.S. exports went to Mexico.

Imports of barite totaled 2.70 Mt, an increase of 20% compared with those of 2013 (table 1). China continued to supply the largest percentage of imported barite, but its share of the total has dropped continually since 2007. In 2007, 98% of imported barite was from China, representing approximately 86% of all barite sold and used in the United States. In 2014, China supplied 61% of total imports, representing approximately 49% of that sold or used by processors in the United States. India supplied 16% of imports, a slight decrease in market share from that of 2013, but up from 2% in 2007. In recent years, Mexico and Morocco have emerged as significant sources of U.S. supply, contributing 11% and 10%, respectively, of total imports in 2014. Imports of the several forms of barite reported under the Harmonized Tariff Schedule nomenclature “Other sulfates of barium” were 16,400 t, a 4% increase compared with those of 2013 (table 6).

The tariff on U.S. imports of crude barite is \$1.25 per metric ton, but no tariff is imposed on imports of ground barite. As a result, the major importers of crude barite have applied for and received foreign trade zone (FTZ) status for many of their grinding mills in the United States. FTZ status means that the ground barite produced by these mills will be reported as imports for consumption and not as crude barite received from foreign suppliers. Grinding mills in FTZs are identified in table 2.

World Review

Because the United States is the world’s leading barite consumer, using approximately 30% to 40% of world production annually, changes in domestic consumption strongly influence world production and trade patterns. When the 4.1-SG barite specification was initially proposed in 2006, key points raised in support of the initiative were the estimated depletion of 4.2-SG barite from Nevada by 2011, with substantial investment required to extend domestic reserves, and the global dependence on and increasing price of barite from two major exporting countries—China and India (Newcaster, 2006). The

acceptance of 4.1-SG and now sub-4.1-SG barite, particularly in the United States, coupled with continued strong demand for barite and large price increases from traditional exporters, has facilitated diversification of supply in the global marketplace. In the past few years, India, Mexico, and Morocco significantly increased barite production, with a corresponding increase in exports to the United States. Although production in 2014 decreased owing to systemic problems within the country’s barite mining industry, India’s production had increased in recent years (table 8). Morocco, having approximately doubled production since 2010, was the world’s second-leading producer in 2014. Mexico, despite a long history of barite production and favorable logistics, has struggled to enter the U.S. market because of quality issues. However, since 2012, production has tripled, and most of the increased production has been exported to the United States. Liberia commenced production in 2012 and has increased production and exports, notably to the United States. Numerous small to midsized producers have also increased production during the past 5 years, including Bolivia, Kazakhstan, Pakistan, Thailand, and Turkey.

Canada.—Fireside Minerals Ltd. installed new processing and packing equipment at its Fireside barite mine in northeast British Columbia, resulting in a 30% increase in production in 2014 (Clarke and others, 2015, p. 5).

The Department of Environment and Conservation of Newfoundland and Labrador released the Buchans Barite Harvesting and Processing Operation environmental registration document from further review (Department of Environment and Conservation of Newfoundland and Labrador, 2014). Barite Mud Services Inc. proposed to restart barite processing at the Buchans Mine in order to extract and concentrate barite to sell to Newfoundland and Labrador’s offshore oil and gas drilling operations. Approximately 50,000 t of sulfide metal tailings from abandoned tailings ponds would be dredged in order to produce 10,000 t of barite concentrate annually. Because Barite Mud Services planned to use existing facilities, no new construction was required and the company anticipated starting operations by the end of 2014 (Barite Mud Services Inc., 2014).

Heemskirk Consolidated Ltd. sold its Lethbridge, Alberta, mineral processing plant that processes barite, gypsum, and zeolite to Marquis Alliance Energy Group Inc. The sale included barite mineral exploration interests in Nevada. The Lethbridge plant processes barite to sell to the drilling market in western Canada (Heemskirk Consolidated Ltd., 2014).

India.—Following investigation of allegations of illegal barite mining, the government of Andhra Pradesh cancelled mining leases issued in 2004 and established a technical committee to issue new licenses in a more transparent manner. The government also sought to investigate the feasibility of improved security measures at mining sites including automation of grading, loading, and transportation; computerization of records; installation of surveillance cameras; setting up solar fencing; and electronic tracking of transport vehicles. The region is estimated to contain more than 95% of India’s barite reserves (FE Bureau, 2014). The allegations and subsequent investigation likely disrupted mining operations for a substantial portion of 2014, resulting in an estimated 35% decrease in production (table 8). Several U.S. barite purchasers

have noted difficulty in obtaining barite from India, particularly 4.2-SG material.

Mexico.—Anaconda Barite planned to increase capacity at its Cobachi Mine in the State of Sonora by installing a new jig to produce barite of 4.1 to 4.2 SG. The company began mining barite in 2013 after purchasing the mineral rights from Compania Minera La Valenciana (Industrial Minerals, 2014a).

Outlook

U.S. demand for barite has been strong in the past several years, owing primarily to increased drilling activity in shale and other low permeability formations. In addition to high specific gravity, barite's properties, including low abrasion, low oil absorption, chemical and physical inertness, nontoxicity, low solubility, and being relatively inexpensive in comparison to alternatives, have made it the leading choice for use as weighting agent in oil and gas drilling. Available substitutes are not expected to significantly displace barite for the foreseeable future. Long-term barite consumption is therefore expected to be commensurate with increased consumption of oil and gas, particularly by developing countries. This outlook is clouded, however, in both the short and long term by factors affecting the barite supply chain as well as volatility in the oil and gas market.

At yearend 2014, the U.S. Energy Information Administration estimated that commercial oil inventories in Organisation for Economic Co-operation and Development countries were 2.75 billion barrels, the highest on record, and were expected to increase further. Rising inventories led to price declines and, by the end of 2014, prices had dropped by almost 50% (U.S. Energy Information Administration, 2015). During periods of low oil and gas prices, the Organization of the Petroleum Exporting Countries (OPEC) has typically attempted to prop up prices by cutting production. In this instance, however, OPEC has continued to maintain production, in what many analysts believe is an attempt to keep prices low in order to drive out higher cost competitors, particularly in the United States. Although it is uncertain how long it will take for the oil and gas market to stabilize, in the short term, the U.S. oil and gas industry has responded by decreasing drilling activity. It is expected that this will lead to a significant decrease in domestic barite consumption in 2015 and possibly longer.

Acceptance of sub-4.2-SG barite, coupled with anticipated reduced consumption of barite in the United States, has alleviated the supply crisis that preceded acceptance of the 4.1-SG specification. However, concerns persist regarding the longer term availability of barite meeting the 4.2-SG specification. Much of the volume supplied by new entrants into the barite market in recent years has been barite of 4.1-SG and lower. Although drilling operations in the United States have gradually moved away from exclusive use of 4.2-SG barite to 4.1-SG and sub-4.1-SG material, 4.2-SG is still used in offshore and deepwater projects where higher density is needed to counteract higher formation pressures, and processors of drilling-grade barite also need to maintain stocks of 4.2-SG barite in order to 'upgrade' lower SG material. Production of

4.2-SG barite remains concentrated in China, India, and to a lesser extent, Morocco. Despite increasing diversification in U.S. barite supply in recent years, the United States is likely to remain dependent on these countries for the foreseeable future.

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TABLE 1
 SALIENT BARITE STATISTICS¹

(Thousand metric tons and thousand dollars)

	2010	2011	2012	2013	2014
United States:					
Barite, primary:					
Sold or used by producers:					
Quantity	662	710	666	723	663
Value ^c	51,000	61,200	74,500	81,900	88,600
Exports:					
Quantity	109	98	151	199	153
Value	17,800	17,300	42,200	58,900	41,800
Imports for consumption: ²					
Quantity	2,110	2,320	2,920	2,250 ^r	2,700
Value	196,000	245,000	430,000	352,000	386,000
Consumption, apparent ³	2,660	2,930	3,430	2,770 ^r	3,210
Crushed and ground, sold or used by processors: ⁴					
Quantity	2,570	2,910	3,310	3,550	3,410
Value	398,000	490,000	618,000	625,000	651,000
World, production ^c	7,700 ^r	8,490 ^r	9,250 ^r	8,590 ^r	9,150

^cEstimated. ^rRevised.

¹Data are rounded to no more than three significant digits.

²Includes crude, ground, and other barite imports.

³Sold or used by producers plus imports minus exports.

⁴Includes imports.

TABLE 2
ACTIVE BARITE MINES AND GRINDING MILLS IN THE UNITED STATES IN 2014

State and operator (owner)	County/Parish	Mine/Mill	Foreign Trade Zone
Mines:			
Georgia, New Riverside Ochre Co.	Bartow	New Riverside Ochre	
Nevada:			
Baker Hughes Drilling Fluids (Baker Hughes Inc.)	Lander	Argenta	
Halliburton Energy Services (Halliburton Co.)	Elko	Rossi	
M-I L.L.C., operating as M-I SWACO (Schlumberger Ltd.)	Lander	Greystone	
NOV Minerals LP (National Oilwell Varco Inc.)	Elko	Big Ledge	
Grinding Mills:			
Georgia, CIMBAR Performance Minerals	Bartow	Chatsworth	
Illinois, J.M. Huber Engineered Minerals Division (J.M. Huber Corp.)	Adams	Quincy	
Indiana, CIMBAR Performance Minerals	Posey	Mt. Vernon	
Louisiana:			
Baker Hughes Drilling Fluids (Baker Hughes Inc.)	St. Mary	Morgan City	No. 124, Gramercy, LA.
Halliburton Energy Services (Halliburton Co.)	Calcasieu	Lake Charles	No. 087, Lake Charles, LA.
Do.	Lafourche	Larose	No. 124, Gramercy, LA.
Excalibar Minerals L.L.C. (Newpark Resources, Inc.)	Iberia	New Iberia	Do.
M-I L.L.C., operating as M-I SWACO (Schlumberger Ltd.)	St. Mary	Amelia	Do.
Nevada:			
Baker Hughes Drilling Fluids (Baker Hughes Inc.)	Lander	Barite Grinding Plant	
Halliburton Energy Services (Halliburton Co.)	Eureka	Dunphy	
M-I L.L.C., operating as M-I SWACO (Schlumberger Ltd.)	Lander	Battle Mountain	
NOV Minerals LP (National Oilwell Varco, Inc.)	Elko	Osino	
Ohio, CIMBAR Performance Minerals	Columbiana	Wellsville	
Tennessee, Excalibar Minerals L.L.C. (Newpark Resources, Inc.)	Dyer	Dyersburg	
Texas:			
Baker Hughes Drilling Fluids (Baker Hughes Inc.)	Nueces	Corpus Christi	No. 122, Corpus Christi, TX.
Halliburton Energy Services (Halliburton Co.)	do.	do.	Do.
CIMBAR Performance Minerals	Harris	Houston	
Excalibar Minerals L.L.C. (Newpark Resources, Inc.)	do.	do.	
Do.	Nueces	Corpus Christi	Do.
M-I L.L.C., operating as M-I SWACO (Schlumberger Ltd.)	Cameron	Brownsville	
Do.	Galveston	Galveston	No. 036, Galveston, TX.
Milwhite Inc. (Control MINAR, S.A. de C.V.)	Cameron	Brownsville	

Do., do. Ditto.

TABLE 3
CRUSHED AND GROUND BARITE SOLD OR USED BY PROCESSORS
IN THE UNITED STATES, BY STATE^{1,2}

State	2013			2014		
	Number of plants	Quantity (thousand metric tons)	Value (thousands)	Number of plants	Quantity (thousand metric tons)	Value (thousands)
Louisiana	6	1,120	\$196,000	5	1,050	\$201,000
Texas	8	1,270	239,000	8	1,260	231,000
Other ³	9	1,160	190,000	9	1,100	219,000
Total	23	3,550	625,000	22	3,410	651,000

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

²Includes imports.

³Includes Georgia, Illinois, Indiana, Nevada, Ohio, and Tennessee.

TABLE 4
CRUSHED AND GROUND BARITE SOLD OR USED BY PROCESSORS
IN THE UNITED STATES, BY USE^{1,2}

(Thousand metric tons and thousand dollars)

Use	2013		2014	
	Quantity	Value	Quantity	Value
Barium chemicals, filler and (or) extender, glass	113	44,200	92	40,100
Well drilling	3,440	581,000	3,320	611,000
Total	3,550	625,000	3,410	651,000

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

²Includes imports.

TABLE 5
U.S. EXPORTS OF NATURAL BARIUM SULFATE (BARITE), BY COUNTRY¹

Country	2013		2014	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Angola	785	\$317	--	--
Brazil	125	76	6,250	\$1,160
Cameroon	3,440	1,510	7,180	3,080
Canada	112,000	17,800	78,700	13,100
China	--	--	306	198
Colombia	98	57	5,090	934
Liberia	--	--	5,150	2,160
Mexico	74,200	35,800	46,800	19,000
Norway	1	5	1,860	1,530
Thailand	70	42	225	82
Trinidad and Tobago	2,300	814	49	14
United Kingdom	1,810	424	4	18
Venezuela	3,310	1,140	774	199
Other	690 ^r	961 ^r	612	361
Total	199,000	58,900	153,000	41,800

^rRevised. -- Zero.

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

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF BARITE, BY COUNTRY¹

Country	2013		2014	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
Crude:				
China	322,000	\$51,000	497,000	\$78,100
Guatemala	--	--	44	12
India	132,000	17,900	117,000	12,600
Japan	2	12	97	6
Liberia	57	22	1,570	279
Mexico	58,600	6,480	207,000	24,000
Morocco	43,900	5,330	147,000	19,400
United Kingdom	158	119	216	136
Total	557,000	80,900	971,000	135,000
Ground:				
Canada	76	40	--	--
China	1,190,000	186,000	1,160,000	160,000
Germany	1,250 [†]	951 [†]	1,140	845
Hong Kong	--	--	89	42
India	288,000	34,400	316,000	39,000
Japan	2,650	457	2,850	490
Liberia	--	--	10,700	1,530
Macao	22,800	2,420	--	--
Mexico	101,000 [†]	13,300	98,500	11,600
Morocco	70,500	10,900	129,000	13,700
United Kingdom	--	--	42	36
Total	1,680,000 [†]	248,000	1,720,000	228,000
Other sulfates of barium:				
Belgium	40	219	--	--
China	6,390	5,910	6,310	5,530
Denmark	--	--	1	9
Germany	6,600	12,900	6,450	12,900
Hong Kong	--	--	68	19
Italy	2,140	2,860	2,900	3,990
Japan	508	1,240	581	1,510
Mexico	--	--	19	4
Netherlands	38	23	--	--
Switzerland	72	87	72	86
United Arab Emirates	--	--	20	17
Total	15,800	23,300	16,400	24,100

[†]Revised. -- Zero.

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

²Cost, insurance, and freight value.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF BARIUM CHEMICALS¹

	2013		2014	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
Barium chloride	2,890	\$2,850	1,110	\$1,090
Barium oxide, hydroxide, peroxide	2,790	5,180 [†]	3,330	5,920
Barium carbonate, precipitated	2,140	4,890	2,870	4,300

[†]Revised.

¹Data are rounded to no more than three significant digits.

²Cost, insurance, and freight value.

Source: U.S. Census Bureau.

TABLE 8
BARITE: WORLD PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country	2010	2011	2012	2013	2014 ^e
Afghanistan ^{e,3}	2,000	2,000	2,000	2,000	2,000
Algeria	42,000	40,000	30,587 ^r	30,245 ^r	56,829 ⁴
Argentina	2,944	5,528	9,416 ^r	26,792 ^r	27,000 ⁴
Australia ^{e,5}	17,000	11,000	13,000	14,000	15,000
Bolivia ^{e,6}	8,000 ^r	22,000 ^r	22,000 ^r	31,000 ^r	27,000
Brazil, beneficiated	41,385	7,039	3,025	--	--
Bulgaria ^e	350	120	--	--	--
Burma ⁷	8,975	30,000	15,339 ^r	31,295	23,060 ⁴
Canada ^e	22,000	22,000	22,000	22,000	35,000
China ^e	3,700,000 ^r	4,100,000 ^r	4,200,000	3,200,000 ^r	3,900,000
Egypt ^e	3,600 ⁴	4,000	4,000	4,000	4,000
Germany	55,887	55,342	52,030	45,446 ^r	70,665 ⁴
India ⁷	1,300,000	1,350,000	1,776,980 ^r	1,738,824	1,136,814 ⁴
Iran ³	322,000 ^r	300,000 ^r	314,769 ^r	300,000 ^{r,e}	300,000
Italy ^e	3,500	3,500	3,500	3,500	3,500
Kazakhstan ^e	200,000	200,000	250,000	250,000	300,000
Laos	17,500	2,500	21,900	10,500 ^r	30,610 ⁴
Liberia ^{e,6}	--	--	8,000	25,000	50,000
Malaysia	1,000	--	--	--	--
Mexico	143,225	134,727	139,997	343,585 ^r	420,000
Morocco	572,429	769,504	1,021,400	1,094,470 ^r	1,200,000
Nigeria ^{e,8}	19,000	19,000	20,000	20,000	20,000
Pakistan ⁹	49,038	56,202	109,415 ^r	118,471	132,433 ⁴
Peru	52,275	87,848	79,451	52,491	106,071 ⁴
Russia ^e	60,000	63,000	63,000	63,000	63,000
Slovakia	9,000 ^r	8,000 ^r	8,000 ^{r,6}	11,000 ^{r,6}	11,000
Spain	2,050	--	--	--	--
Thailand	33,465	67,703	64,499	107,437 ^r	134,961 ⁴
Turkey	172,618	250,786	187,111 ^r	215,000 ^{r,6}	270,000
United Kingdom	34,099	31,000	30,000	30,000	44,000 ⁴
United States ¹⁰	662,000	710,000	666,000	723,000	663,000 ⁴
Vietnam ^{e,6}	140,000 ^r	135,000 ^r	110,000 ^r	75,000 ^r	100,000
Other ¹¹	622	613	119 ^r	371 ^r	43
Total ^e	7,700,000 ^r	8,490,000 ^r	9,250,000 ^r	8,590,000 ^r	9,150,000

^eEstimated. ^rRevised. -- Zero.

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

²Includes data available through November 1, 2015.

³Data are for fiscal year beginning March 21 of that stated.

⁴Reported figure.

⁵Estimated based on data reported by the government of South Australia.

⁶Estimated based on trade data.

⁷Data are for year beginning April 1 of that stated.

⁸Considerably more barite is produced, but it is considered to be commercially unusable.

⁹Data are for year beginning July 1 of that stated.

¹⁰Crude barite sold or used by producers.

¹¹Includes Armenia, Bosnia and Herzegovina, Guatemala, and Portugal.