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2010 Minerals Yearbook

BARITE

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BARITE

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In 2010, primary barite production (sold or used by producers) totaled 662,000 metric tons (t) valued at $37.2 million, and apparent consumption was 2.66 million metric tons (Mt). Imports were 2.11 Mt and exports were 109,000 t.

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 methods, such as jigging, tabling, washing, or more complex methods, such as flotation, heavy-media separation, and magnetic separation. Most barite ore requires some upgrading to minimum purity or density levels.

Production

Domestic production and sales data for barite were derived from voluntary responses to the U.S. Geological Survey (USGS) canvass of 7 mines and 26 grinding plants. The USGS received responses from 3 mines and 19 grinding mills, representing 71% of the quantity of ground barite sold. Estimates were made using company production estimates, prior year data, and other industry data. Seven mines were included in the survey—five were producing and two were idle.

Of the canvassed producing mines, four were in Nevada, and one was in Georgia; the idle mines were in Nevada. There were 23 grinding plants operating at the end of the reporting year. Most Nevada barite ore was ground at nearby company-owned grinding plants in Nevada, but the ore from NOV Minerals LP was shipped out of State to its grinding mill in Evanston, WY. Some run-of-mine ore was shipped to Canada for grinding. In 2010, very little, if any, crude barite was shipped to plants on the U.S. Gulf Coast for grinding. This practice has become uncommon in recent years because the cost of transport made Nevada barite uncompetitive with imported barite. Although import prices for barite from China have increased substantially in the past few years, shipments of barite to the Gulf Coast have remained rare. Demand in the Western United States and Western Canada was so strong in recent years that Nevada barite producers were able to sell all their production to western customers.

Crude barite production was 662,000 t in 2010, an increase of nearly 73% compared with that of 2009. The value of domestic production was $37.2 million, an increase of 87%. The bulk of mine production was from Nevada, with a small amount from Georgia. The increase in Nevada's mine production was the result of increased oil and gas drilling driven by higher oil and gas prices.

In 2010, there were four active barite mines in Nevada—Big Ledge Mine (NOV Minerals) and Rossi Mine (Halliburton Energy Services-Baroid) in Elko County, and Argenta Mine (Baker Hughes Drilling Fluids) and Greystone Mine (M-I L.L.C. operating as M-I SWACO) in Lander County. In addition to these Nevada operations, there was one small barite producer in Georgia—New Riverside Ochre Co., Inc.

In 2010, the leading companies that mined and ground barite in the United States were also major oil service companies, which included Baker Hughes Drilling Fluids (a division of Baker Hughes Inc.), Baroid Fluid Services (the drilling fluids and industrial barite subsidiary of Halliburton Energy Services, Inc.), M-I SWACO (a subsidiary of Schlumberger Ltd.), and National Oilwell Varco (NOV). These four companies operated barite mines with associated beneficiation mills and grinding plants in Nevada (or in the case of NOV in Wyoming) and also operated grinding plants in Louisiana and Texas.

At yearend 2010, there were 14 grinding operations on the coast of the Gulf of Mexico (6 in Louisiana and 8 in Texas) that produced barite to American Petroleum Institute (API) specifications. These stand-alone grinding plants primarily processed crude barite imported from China and India that was ground to API specifications for the oil and gas drilling market. Baker Hughes had single plants in Morgan City, LA, and Corpus Christi, TX. Baroid (Halliburton) had two plants in Louisiana at Lake Charles and Larose, and a single plant in Corpus Christi, TX. In 2010, Halliburton completed construction of a new barite grinding mill in Larose, LA. The new grinding mill replaced the company's New Orleans grinding mill, which was shut down when the new plant came online late in the year (Sandy Champagne, oral commun., July 20, 2011). The new plant in Lafourche Parish was designed to allow for easy transport of barite to Halliburton's wharf facilities at Port Fourchon that support offshore oil drilling operations in the Gulf of Mexico (Schmidt, 2009). M-I SWACO (M-I LLC) operated single mills in Amelia, LA, Brownsville, TX, and Galveston, TX. The Brownsville mill was acquired from U.S. Clay LP in 2010. National Oilwell Varco operated a barite grinding plant in Houma, LA (formerly Ambar Lone Star Fluids Services, LLP). National Oilwell Varco acquired Ambar in early in 2010 (National Oilwell Varco Inc., 2010) .

In addition to the barite mining companies, there were a number of other companies that operated grinding mills primarily designed to process imported crude barite. These included Excalibar Minerals Inc. (a division of Newpark Resources, Inc. of Houston), a major barite importer and grinder with one mill in New Iberia, LA, and two mills in Texas at Corpus Christi and Houston. These mills primarily supplied barite to the oil and gas drilling market. The company also operated a grinding plant in Tennessee, which mostly served nondrilling markets. There were two other companies near the Gulf of Mexico that received imported barite by ship through ports in Louisiana and Texas—CIMBAR Performance Minerals, Inc. (Cartersville, GA) in Houston, TX, and Milwhite, Inc.

(a subsidiary of Mexico's Control MINAR, S.A. de C.V.) in Brownsville, TX.

Grinding plants that produced commercial filler-grade barite or chemical-grade barite were located primarily in the Southeast, Midwest, and Texas. Five companies reported sales of barite for nondrilling uses, and by far the leading producer was CIMBAR, which produced most of its nondrilling barite at its three grinding mills in Georgia, Indiana, and Missouri. CIMBAR's second Georgia plant (Cartersville) was idle in 2010.

Consumption

In April 2010, the explosion of the Deepwater Horizon drilling rig and subsea blowout of the Macondo oil well in the Gulf of Mexico resulted in the largest offshore oil spill in U.S. history. A 6-month moratorium on deepwater drilling was declared by the Government in late May and lifted in October after the U.S. Department of the Interior introduced new safety standards for operators drilling in water depths greater than 152 meters (m) (500 feet) (U.S. Department of the Interior, 2010). The drilling moratorium and more stringent regulatory reviews of shallow-water drilling applications reduced offshore drilling operations in the Gulf of Mexico, which resulted in a decrease in barite sales and consumption in the Gulf of Mexico. In mid-April (before the moratorium), there were 55 drilling rigs operating in the Gulf of Mexico, but by mid-July the number had dropped to 12 (Baker Hughes Inc., 2011). Deepwater wells require much larger amounts of barite than most onshore wells because of deeper drilling depths and higher pressures, so this small decrease in operating rigs had a significant impact on Gulf of Mexico barite sales. Some experts estimate it could take 2 years for oil and gas production in the Gulf of Mexico to return to prespill levels.

In 2010, apparent consumption of barite increased by 51% to 2.66 Mt compared with that in 2009 (table 1). Ground barite sales increased by about 24% to 2.57 Mt in 2010 from 2.08 Mt in 2009. In 2010, sales by grinding plants in Louisiana were essentially unchanged at 915,000 t, grinding plant sales in Texas increased by 59% to 907,000 t, while sales by plants in all other States increased by nearly 27% to 748,000 t (table 2). About 2.44 Mt, or 95%, of barite sales from domestic crushers and grinders was for petroleum well-drilling markets, and the remaining 5% was for industrial end uses (table 3).

The leading application for barite is as a weighting agent in natural gas and oil field drilling muds to suppress high formation pressures and prevent blowouts. As a well is drilled, the bit passes through various formations, each with different characteristics. The deeper the hole, the more barite is needed 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.

Barite used for drilling petroleum wells can be black, blue, brown, buff, or gray depending on the ore body. Most barite needs to be ground to a small uniform size before it is used as a weighting agent in petroleum well-drilling mud based on specifications set by the API or the former Oil Companies' Materials Association.

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 specific gravity of 4.2. In 2008, the API began examining a proposal to lower the barite specific gravity specification to 4.1. In February 2010, the API issued a new edition of API Specification 13A, Specification for Drilling Fluids Materials (effective date, August 1, 2010). This new edition of Specification 13A added specifications for 4.1 specific gravity barite, but also retained specifications for 4.2 specific gravity barite. Other barite specifications remain unchanged from the previous standard and are the same for 4.1 and 4.2 specific gravity 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 as calcium (American Petroleum Institute, 2010, p. 13–23, 83–96). 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 law. 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 cadmium and 1 part per million mercury (Drilling Waste Management Information System, undated).

The idea of using 4.1 specific gravity barite was put forth in late 2006, and since then it has become widely adopted in the Western United States. Offshore drillers continue to use 4.2 specific gravity barite as do onshore customers in other parts of the country that rely on imported barite.

With the U.S. economy recovering in 2010, energy demand increased and this resulted in higher oil and gas prices compared with their lows in 2009. Increased energy demand and higher energy prices were reflected in 2010 by the increase in domestic oil and gas drilling. Oil prices (U.S. spot price) increased by about 28% compared with those of 2009. In 2010, the monthly average was about $79 per barrel compared with an average of nearly $62 per barrel in 2009 (U.S. Energy Information Administration, 2011a). The U.S. monthly average natural gas price (wellhead) was $3.67 per thousand cubic feet in 2009 but increased to $4.16 per thousand cubic feet in 2010. This was, however, still significantly below the 2008 average of $7.97 per thousand cubic feet (U.S. Energy Information Administration, 2011b).

The rebound in oil and gas prices in 2010 encouraged increased exploration drilling in the United States. The weekly U.S. drill rig count in 2010 began the year at 1,220, increased rapidly during the winter and spring to 1,535, decreased slightly owing to the deepwater drilling moratorium, but overall continued to increase and finished the year at 1,694. This number approached the 2008 yearend count of 1,721,

but it was still significantly below the peak of 2,031 reached in late summer 2008. Much of the rig count increase was in oil exploration, which accounted for 347 (or 73%) of the 474 additional drill rigs operating at the end of 2010. The percentage of drill rigs exploring for oil accounted for 45% of the total at yearend 2010, up from 35% the previous year. Much of the increased oil exploration activity was in the Williston Basin in northeastern Montana and northwestern North Dakota and in the Permian Basin of West Texas (Baker Hughes Inc., 2011) .

In 2010, sales of domestic and imported barite for industrial uses increased by 11% to 131,000 t (table 3). Industrial end uses such as barium chemicals (the largest by volume is barium carbonate), filler in paint and plastics, and powder coatings all require the barite to be ground to a small uniform size. The size depends on the use, but for paint- and plastic-grade material, it averages about 2 to 3 µm. Barite-containing materials that are used for sound reduction in engine compartments are gaining market share among automotive manufacturers. Barite also is used in the base coat of automobile finishes for smoothness and corrosion resistance and continues to be used in friction products for automobiles and trucks.

Barite used as an aggregate in "heavy" cement or radiation-shielding cement is crushed and screened to sizes ranging from 4.75 millimeters (0.187 inches) to 3.75 centimeters (1.5 inches) for the coarse grade. New Riverside Ochre (Cartersville, GA) is the leading supplier of barite aggregate.

Foreign Trade

Barite exports in 2010 were 109,000 t, which was an increase of about 60,000 t compared with those of 2009. Most exports went to Canada (90%) in the form of crude barite, which was ground in Canada and then consumed for oil and gas drilling in the western provinces of Alberta, British Columbia, and Saskatchewan. The bulk of the remaining exports went to Mexico (5%) and Venezuela (2%) (table 4).

Assignment of the correct harmonized tariff schedule (HTS) number by importers is sometimes problematic. As a result, in prior years, adjustments were made in an attempt to classify imports of crude natural barite, ground barite, and other sulfates of barium by type and use. These adjustments involved separating, by unit value, imports intended for use in drilling muds (crude and ground barite), and all other uses (other sulfates of barium). Beginning in 2008 this practice was discontinued, and the data shown in table 5 for 2009 and 2010 are as reported by the U.S. Census Bureau.

Combined imports of barite (crude and ground) totaled 2.09 Mt, an increase of 47% compared with those of 2009. China accounted for 92% of the total, with India (4%) and Morocco (3%) making up most of the rest. Imports for the several forms of barite reported under the HTS nomenclature "Other sulfates of barium" were 14,700 t, which represents an increase of 39% compared with those of 2009 (table 5).

There is a tariff on U.S. imports of crude barite of $1.25 per metric ton, but there is no tariff on imports of ground barite. As a result, some of the major importers of crude barite have applied for and received foreign trade zone (FTZ) status for their grinding mills in the United States. In 2007, M-I SWACO received FTZ approvals for the company's grinding plants in Amelia, LA, and Galveston, TX. In 2008, Baker Hughes received FTZ approvals for its grinding plants in Morgan City, LA, and Corpus Christi, TX. Also in 2008, Halliburton received FTZ approvals for its grinding plants in New Orleans, LA; Westlake, LA; and Corpus Christi, TX. In January 2010, Excalibar Minerals received FTZ approval for its grinding plant in Corpus Christi, TX. FTZ status means that the ground barite produced by these mills will be reported as imports for consumption and not crude barite received from foreign suppliers (U.S. Department of Commerce, Import Administration, 2011).

Transportation

In recent years, about 80% of U.S. barite consumption has been supplied by imports (primarily from China). 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 near-shore 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. The PAD districts were World War II divisions of the oil-producing areas of the United States; these designations continue to be used.

Prices

The average sales value for primary barite from mines and their associated beneficiation plants in the United States increased to about $56 per metric ton, an increase of about $4 per metric ton compared with that of 2009 (table 1). Compared with those of 2009, the average sales value for barite ground in Louisiana was essentially unchanged at about $144 per ton, while the sales value for drilling-grade barite ground in Texas decreased slightly to about $165 per ton. The average value for all grades ground in Texas was essentially unchanged at $169 per ton, while the sales value of barite ground in other States increased to about $142 per ton (table 2). Barite for barium chemicals, filler and extender, and glass decreased by 3% to $334 per ton for 2010 compared with that of 2009 (table 3).

The December 2010 United States published import prices for barite from China, API grade, lump, including cost, insurance, and freight, U.S. Gulf Coast, were in a range of $100 to $108 per ton compared with $94 to $108 per ton in December 2009. The price for Indian barite increased to a range of $107 to $112 per ton compared with $97 to $99 per ton in December 2009. The price of chemical-grade barite from China increased from $92 to $114 per ton in December 2009 to a range of $138 to $145 per ton in December 2010 (Industrial Minerals, 2009; 2010).

World Review

China.—Weather conditions in China (drought in the winter and early spring and flooding in the summer and fall) hampered production and shipment of barite during 2010. Much of China's barite resources are in the Provinces of Fujian, Guangdong, Guangxi, Guizhou, and Hunan in southern China, which was

the region hit hardest by the adverse weather (Russell, 2010). In addition to weather problems, some small producers in Guangxi Province ceased production owing to recently introduced reclamation bond requirements. These permitting requirements, wage increases to miners, and higher fuel prices resulted in higher barite prices, free on board China, which increased throughout the year (Newcaster, 2011). In 2010, China's barite exports were 2.57 Mt, an increase of 800,000 t compared with those of 2009, but still 1.27 Mt less than those of 2008.

India.—India, the world's second leading barite producer, experienced weather-related problems in its barite mining industry as its major barite mine in Andhra Pradesh was flooded by late summer monsoon rains. The lower part of the mine that produced higher quality 4.2 specific gravity product was flooded (Russell, 2010).

Vietnam.—Vietnam's Institute of Geology and Mineral Resources has identified and assessed more than 20 deposits and occurrences of barites with total reserves of 6.2 Mt. Vietnam's primary barite resources are located in three areas in the northern part of the country near the borders with China and Laos and near the coast of the Bac Bo Gulf (Gulf of Tonkin) in North Trung Bo. In 2010, most production was from the Ao Sen deposit in the northeast Bac Bo region, Tuyen Quang Province, which has the capacity to produce about 80,000 metric tons per year (t/yr). Vietnam has developed plans to expand its barite mining industry during the next 15 years, with a target production of 300,000 to 350,000 t/yr (Phuong, 2011).

Outlook

Domestic exploration is expected to continue in response to long-term U.S. demand for oil and gas. The global recession of 2008–09 resulted in dramatic decreases in energy consumption and associated fuel prices. The U.S. economic recovery has been slow and growth in domestic energy consumption has lagged as a result. In recent years, the majority of drill rigs operating in the United States have been exploring for natural gas because the United States has large natural gas resources compared with oil resources. Natural gas production has been increasing faster than consumption, putting downward pressure on natural gas prices—which increased from the lows reached in 2009 but were still significantly below prices reported for 2003–08. Data indicate that dry natural gas production in the first 5 months of 2011 was up 6.0% compared with the same period in 2010. However, natural gas consumption was up only 2.0% during the same time period (U.S. Energy Information Administration, undated). Low natural gas prices may slow exploration activities, especially in areas where the drilling targets are deep and drilling costs are high. For example, the Haynesville Shale located mostly in northern Louisiana lies at a depth of about 3,000 m (10,000 feet).

The 2011 drill rig count through mid-August had risen to 1,974 after beginning the year at 1,694. This increase in exploration activities indicates increased consumption of barite. If the economy continues to stagnate or falls into another recession, energy consumption may fall and with it energy prices resulting in less oil and gas exploration and a decrease in barite consumption.

In the future, natural gas's share of U.S. power generation is likely to increase because of relatively low natural gas prices and the prospect of stricter environmental controls on powerplant emissions. These conditions may result in power companies deferring coal-fired powerplants and building cleaner gas-fired plants in their place. Increased natural gas use may be bolstered by recent increases in the Nation's estimated gas reserves, which reached the highest level since 1971. In 2009, driven by shale gas development, U.S. gas reserves increased to 284 trillion cubic feet. According to the U.S. Energy Information Administration, Louisiana, Arkansas, Texas, Oklahoma, and Pennsylvania were the leading States in adding new proved reserves of natural gas during 2009. Much of this increase in gas reserves is the result of new and advanced exploration, well drilling, and well completion technologies, which allows recovery of natural gas from active and newly developing shale-gas fields (U.S. Energy Information Administration, 2010). A switch from coal to natural gas in new powerplants would likely provide a boost to domestic drilling and increase the demand for barite.

References Cited

American Petroleum Institute, 2010, Specification for drilling fluids materials—ANSI/API Specification 13A (18th ed.): Washington, DC, American Petroleum Institute, 109 p.

Baker Hughes Inc., 2011, Baker Hughes investor relations: Houston, TX, Baker Hughes Inc. (Accessed July 1, 2011, via http://investor.shareholder.com/bhi/rig_counts/rc_index.cfm.)

Drilling Waste Management Information System, [undated], Fact sheet—Discharge to ocean: Argonne, IL, Argonne National Laboratory. (Accessed September 22, 2010, at http://web.ead.anl.gov/dwm/techdesc/discharge/index.cfm.)

Industrial Minerals, 2009, Prices: Industrial Minerals, no. 507, December, p. 68–70.

Industrial Minerals, 2010, Prices: Industrial Minerals, no. 519, December, p. 69–71.

National Oilwell Varco Inc., 2010, NOV acquires Ambar Lone Star Fluids Services: Houston, TX, National Oilwell Varco Inc. news item, January 20, 1 p.

Newcaster, John, 2011, Barytes sun sets in China: Industrial Minerals, no. 522, March, p. 23–24.

Phuong, T.K., 2011, Sun rises on Vietnam's barytes: Industrial Minerals, no. 525, June, p. 44–51.

Russell, Alison, 2010, Severe weather impacts barytes supply: Industrial Minerals, no. 518, November, p. 15.

Schmidt, Kathrine, 2009, Construction begins on grinding plant: HoumaToday.com, December 13, 2 p. (Accessed December 14, 2009, at http://www.houmatoday.com/ article/20091213/ARTICLES/912129960?Title=Construction-begins-on-grindind-plant.)

U.S. Department of Commerce, Import Administration, 2011, U.S. Foreign-Trade Zones Board—Order summary (1935–2011): U.S. Department of Commerce, July 7. (Accessed July 27, 2011, via http://ia.ita.doc.gov/ftzpage/orders/ord1616-1700.html.)

U.S. Department of the Interior, 2010, Interior issues directive to guide safe, six-month moratorium on deepwater drilling: U.S. Department of the Interior press release, May 30. (Accessed July 15, 2011, at http://www.doi.gov/news/pressreleases/Interior-Issues-Directive-to-Guide-Safe-Six-Month-Moratorium-on-Deepwater-Drilling.cfm.)

U.S. Energy Information Administration, 2010, Shale gas development drives U.S. natural gas proved reserves to highest level since 1971: U.S. Energy Information Administration press release, November 30. (Accessed July 29, 2011, via http://www.eia.gov/pressroom/releases/press349.cfm.)

U.S. Energy Information Administration, 2011a, Cushing, OK WTI spot price fob (Dollars per barrel): U.S. Energy Information Administration, July 27. (Accessed July 29, 2011, at http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=M.)

U.S. Energy Information Administration, 2011b, Table 3—Selected national average natural gas prices, 2005–2010: U.S. Energy Information

Administration, February. (Accessed July 29, 2011, at http://www.eia.gov/pub/oil_gas/natural_gas/data_publications/natural_gas_monthly/historical/2011/2011_02/pdf/table_03.pdf.)
U.S. Energy Information Administration, [undated], Natural gas—Overview: U.S. Energy Information Administration. (Accessed August 22, 2011, via http://www.eia.gov/naturalgas/.)

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

Barite. Ch. in Mineral Commodity Summaries, annual.
Barite. Ch. in United States Mineral Resources, Professional Paper 820, 1973.

Other

Barite. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.
Barium Minerals. Ch. in Industrial Minerals and Rocks (7th ed.), Society for Mining, Metallurgy, and Exploration, Inc., 2006.
Barytes. British Geological Survey Mineral Profile, September 2005.
Economics of Barytes, The (10th ed.). Roskill Information Services Ltd., 2006.

TABLE 1
SALIENT BARITE STATISTICS[1]

(Thousand metric tons and thousand dollars)

	2006	2007	2008	2009	2010
United States:					
Barite, primary:					
Sold or used by producers:					
Quantity	589	455	648	383	662
Value	23,500	20,600	30,900	19,900	37,200
Exports:					
Quantity	72	15	62	49	109
Value	12,100	6,300	10,500	10,200	17,800
Imports for consumption:[2]					
Quantity	2,550	2,600	2,620	1,430	2,110
Value	160,000	193,000	208,000	129,000	196,000
Consumption, apparent[3]	3,070	3,040	3,210	1,770	2,660
Crushed and ground, sold or used by processors:[4]					
Quantity	3,040	2,980	2,840	2,080	2,570
Value	289,000	308,000	317,000	307,000	391,000
World, production	7,910 r	7,790 r	8,570 r	6,430 r	7,850 e

eEstimated. rRevised

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

[2]Includes crude, ground, and other barite imports.

[3]Sold or used plus imports minus exports.

[4]Includes imports.

TABLE 2
CRUSHED AND GROUND BARITE SOLD OR USED BY PROCESSORS
IN THE UNITED STATES, BY STATE[1, 2]

	2009			2010		
State	Number of plants	Quantity (thousand metric tons)	Value (thousands)	Number of plants	Quantity (thousand metric tons)	Value (thousands)
Louisiana	6	921	$134,000	7	915	$132,000
Texas	8	569	96,000	8	907	153,000
Other[3]	12	591	77,100	11	748	106,000
Total	26	2,080	307,000	26	2,570	391,000

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

[2]Includes imports.

[3]Includes Georgia, Illinois, Indiana, Missouri, Nevada, Tennessee, and Wyoming.

TABLE 3
CRUSHED AND GROUND BARITE SOLD OR USED BY PROCESSORS
IN THE UNITED STATES, BY USE[1, 2]

(Thousand metric tons and thousand dollars)

	2009		2010	
Use	Quantity	Value	Quantity	Value
Barium chemicals, filler and (or) extender, glass	118	40,800	131	43,800
Well drilling	1,960	266,000	2,440	347,000
Total	2,080	307,000	2,570	391,000

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

TABLE 4
U.S. EXPORTS OF NATURAL BARIUM SULFATE (BARITE), BY COUNTRY[1]

	2009		2010	
Country	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Brazil	4,930	$1,270	1,470	$1,020
Canada	37,700	7,020	97,200	13,600
Costa Rica	24	17	204	144
Egypt	--	--	694	134
Mexico	4,310	1,200	5,500	1,610
Oman	858	152	402	109
Trinidad and Tobago	92	38	409	174
Venezuela	202	64	2,060	583
Other[2, 3]	1,190 r	425 r	662	432
Total	49,300	10,200	109,000	17,800

[r]Revised. -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes countries with full year quantities of less than 200 metric tons in 2010.
[3]Includes The Bahamas (2009), Belize (2009), Cameroon (2009), China, Ecuador, Equatorial Guinea (2010), France (2010), Germany (2010), Guatemala (2010), Israel (2010), Italy (2009), Lebanon, Malaysia, Mozambique (2009), Russia (2010), Singapore (2010), Taiwan (2009), and Thailand.

Source: U.S. Census Bureau.

TABLE 5

U.S. IMPORTS FOR CONSUMPTION OF BARITE, BY COUNTRY[1]

Country	2009		2010	
	Quantity (metric tons)	Value[2] (thousands)	Quantity (metric tons)	Value[2] (thousands)
Crude:				
Canada	621	$17	8	$3
China	502,000	54,000	754,000	75,900
India	41,800	3,540	45,500	4,690
Japan	6	13	--	--
Malaysia	--	--	636	18
Mexico	5,590	465	18,100	1,390
Morocco	21,800	1,930	54,900	5,180
Norway	--	--	230	60
Total	572,000	60,000	873,000	87,300
Ground:				
Canada	--	--	8,060	510
China	826,000	55,400	1,170,000	87,000
Germany	569	548	1,150	582
India	23,800	1,790	38,400	3,050
Italy	--	--	27	5
Japan	88	225	1,690	365
Mexico	764	129	--	--
Netherlands	--	--	4	3
Spain	--	--	19	12
United Kingdom	--	--	86	43
Total	851,000	58,100	1,220,000	91,500
Other sulfates of barium:				
Brazil	78	39	--	--
Canada	1	2	--	--
China	3,550	2,230	4,380	2,940
Denmark	--	--	5	4
Germany	4,870	6,020	7,640	10,700
Italy	1,540	1,340	1,920	1,720
Japan	527	1,220	670	1,630
Netherlands	--	--	130	58
Spain	14	12	--	--
Switzerland	2	4	--	--
United Kingdom	(3)	3	(3)	8
Total	10,600	10,900	14,700	17,000

-- Zero.

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

[2]Cost, insurance, and freight value.

[3]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 6

U.S. IMPORTS FOR CONSUMPTION OF BARIUM CHEMICALS[1]

	2009		2010	
	Quantity (metric tons)	Value[2] (thousands)	Quantity (metric tons)	Value[2] (thousands)
Chloride	466	$551	352	$431
Oxide, hydroxide, peroxide	2,890	5,050	4,290	4,940
Carbonate, precipitated	814	649	2,780	2,530

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

[2]Cost, insurance, and freight value.

Source: U.S. Census Bureau.

TABLE 7
BARITE: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country	2006	2007	2008	2009[e]	2010[e]
Algeria	64,787	63,098	60,088	38,000 [r, 3]	60,000
Argentina	6,276	37,979	3,170	3,416 [r, 3]	3,200
Australia[e]	21,000	16,000	21,000 [r]	20,000 [r]	21,000
Bolivia	8,943	8,245	10,900	2,069 [r, 3]	7,845 [3]
Brazil, beneficiated	19,151	13,311	23,276 [r]	38,550 [r]	40,000
Bulgaria[e, 4]	74,500	51,000	40,000	14,300	15,000
Burma	2,930	6,813	5,679	7,623 [3]	8,975 [3]
Canada	20,000	9,000	12,000	15,000	22,000 [p]
China[e]	4,400,000	4,400,000	4,600,000	3,000,000	4,000,000
France[e]	30,000	--	--	--	--
Germany	85,524	72,555 [r]	78,941	45,606 [r, 3]	50,000
India[e]	950,000	1,000,000	1,100,000	1,200,000	1,100,000
Iran[e, 5]	230,000 [r]	249,495 [3]	226,590 [r, 3]	240,000 [r]	200,000
Italy[e]	5,000	5,000	5,000	3,500	3,500
Kazakhstan[4]	120,000 [r]	130,000 [r]	170,000 [r]	170,000 [r]	200,000
Laos[e]	29,000	29,000	29,000	29,000	29,000
Mexico	206,106	185,921	140,066	151,791 [3]	134,493 [3]
Morocco[4]	525,000 [r]	500,000 [r]	590,000 [r]	520,000 [r]	650,000
Nigeria[e, 6]	6,300	5,000	5,000	5,000	5,000
Pakistan	45,169	48,044 [r]	48,000 [r]	49,000 [r]	49,000
Peru	23,800	27,369	42,660	27,875 [3]	81,087 [3]
Russia[e]	63,000	63,000	63,000	63,000	60,000
Slovakia, concentrate	16,000	11,000	12,950	8,000 [r]	10,000
Spain	45,000	35,000	--	--	--
Thailand[7]	4,549 [r]	8,631	9,180	51,895 [r, 3]	52,000
Turkey	161,993	184,041	482,740 [r]	213,187 [r, 3]	250,000
United Kingdom[e]	50,000	55,000	50,000	50,000	50,000
United States[8]	589,000	455,000	648,000	383,000 [3]	662,000 [3]
Vietnam[e]	100,000 [r]	120,000 [r]	90,000 [r]	75,000 [r]	85,000
Other[9]	4,708	2,118 [r]	3,434 [r]	3,117 [r, 3]	3,157 [3]
Total	7,910,000 [r]	7,790,000 [r]	8,570,000 [r]	6,430,000 [r]	7,850,000

[e]Estimated. [p]Preliminary. [r]Revised. -- Zero.

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

[2]Table includes data available through June 23, 2011.

[3]Reported figure.

[4]Estimated marketable production, may differ from reported production data.

[5]Data are for fiscal year beginning March 21 of that stated.

[6]Considerably more barite is produced, but it is considered to be commercially unusable.

[7]Data for 2006–09 reported by Thailand Department of Primary Industries and Mines, data for 2010 from USGS.

[8]Crude barite sold or used by producers.

[9]Includes Afghanistan, Bosnia and Herzegovina, Chile, Colombia, Egypt, Guatemala, and Poland.