



2008 Minerals Yearbook

SODA ASH [ADVANCE RELEASE]

SODA ASH

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The values of soda ash production and exports and the average annual value of production reached record highs in 2008. Tight supplies and a strong export market prompted higher domestic and export prices for soda ash. The total value of U.S. soda ash was \$1.52 billion.

Soda ash, also known as sodium carbonate (Na_2CO_3), is an alkali chemical refined from the mineral trona or naturally occurring sodium carbonate-bearing brines (the soda ash from both is referred to as natural soda ash) or manufactured from one of several chemical processes (the soda ash from this process is referred to as synthetic soda ash).

Soda ash is an important industrial compound used to manufacture chemicals, glass, pulp and paper, soaps and detergents, and many other familiar consumer products. The United States has the world's largest natural deposit of trona and is the world's second ranked soda ash-producing nation. U.S. natural soda ash is extremely competitive in world markets because the majority of the world output of soda ash is made synthetically, which is usually a more expensive process.

Production

Soda ash production and inventory data were collected by the U.S. Geological Survey (USGS) from monthly, quarterly, and annual voluntary surveys of the U.S. soda ash industry. A survey request was sent to each of the five soda ash companies, all of which responded, representing 100% of the total production data in this report (table 1).

The United States remained the world's second ranked soda ash-producing nation. After more than a century of the United States leading in the world's production of soda ash, China overtook the United States in 2003, and it appeared that China would continue to be the world's leader for the foreseeable future. U.S. production of natural soda ash from California and Wyoming in 2008 was a record 11.3 million metric tons (Mt). Based on about 14.5 million metric tons per year (Mt/yr) (16 million short tons per year) of total nameplate production capacity, the U.S. soda ash industry operated at 78% of total capacity. This capacity utilization rate appears to be low because it includes the full nameplate capacity of 900,000 metric tons per year (t/yr) (1 million short tons per year) for Solvay Chemicals, Inc.'s Parachute, CO, plant, OCI Chemical Corp.'s of 816,000 t/yr (900,000 short tons per year), and FMC Corp.'s Granger plant of 726,000 t/yr (800,000 short tons per year), which included nameplate capacity idled in 2008.

Approximately 2.45 Mt/yr of nameplate capacity (2.70 million short tons per year), which represented about 17% of total industry nameplate capacity, was idled in 2008. This available capacity could be brought back online when market conditions improve. The U.S. soda ash industry switched to using the term "effective capacity" to minimize the effect that

mothballed capacity had on operating rates. This resulted in higher capacity utilization percentages. Individual effective capacity data are not publicly disclosed. However, the producers continue to use nameplate capacities to determine export allocations set by the export association, the American Natural Soda Ash Corp. (ANSAC).

The U.S. soda ash industry consisted of five companies in 2008—four companies operating five plants in Wyoming that produced soda ash from underground trona ore and one in California that produced soda ash from sodium-carbonate-rich brines. Solvay operated a plant in Wyoming and a plant in Colorado, which was mothballed in September 2004 but continued sodium bicarbonate production using soda ash feedstock from the company's Wyoming soda ash facility. Stating that demand for soda ash has increased, FMC had restarted its Granger, WY, plant in June 2005, which it had acquired from Tg Soda Ash, Inc. in 1999 and had idled in May 2001. The company brought back onstream 276,000 t/yr (250,000 short tons per year) of the 1.18 Mt/yr (1.3 million short tons per year) of total nameplate production capacity available. FMC brought another 250,000 short tons of idled capacity back onstream in 2006. The idled capacity that was back onstream by 2008 helped compensate for the loss of soda ash production from Solvay's Parachute, CO, facility that had idled soda ash capacity in 2003.

On February 8, 2008, FMC Corp. announced that it planned to recommission its entire mothballed capacity at its Granger soda ash plant by 2012 because of the increased demand in export sales. About 90,700 t/yr (100,000 short tons per year) would restart in 2009 with the remaining 635,000 t/yr (700,000 short tons per yr) coming online in the next 3 to 4 years, depending on the export market (Gupta, 2008).

Each of the U.S. companies is either wholly owned or partially owned by foreign soda ash-producing companies or foreign soda ash consumers. In January, Tata Chemicals Ltd. of India acquired General Chemical Industrial Products, Inc. for \$1 billion, including the 75% share of General Chemical's soda ash business (Newsquest Media Group, 2008). As a result of the acquisition, the U.S. soda ash industry for the first time was no longer a primarily U.S.-owned industry; 62% was foreign, and 38% was domestic. At yearend, the countries and percentage ownership are India, 34%; Belgium, 31%; Japan, 18%; and the Republic of Korea, 17%.

Consumption

The USGS collects soda ash consumption data by end use on a quarterly basis from the marketing and sales departments of each company. Every effort has been made to categorize company sales within the correct end-use sector. Quarterly reports are often revised in subsequent quarters because of customer reclassifications or other factors. All U.S. soda ash companies

responded to the quarterly surveys; data represented 100% of the total reported consumption data found in this report.

In 2008, U.S. apparent consumption and reported consumption were virtually identical. Apparent consumption of soda ash was 5.86 Mt; reported consumption was 5.73 Mt (table 1). Reported consumption and apparent consumption do not necessarily correspond because reported consumption is sales reported by producers, whereas apparent consumption is the calculated quantity available for domestic consumption based on balancing supply (production, imports, and inventory adjustments) with external demand (exports).

When the two types of consumption do not closely correspond, the difference is usually attributed to a discrepancy in the export data that were used to derive consumption statistics. The two sources for export data were the U.S. Census Bureau, which reports exports upon departure from U.S. ports, and the California and Wyoming soda ash producers, which consider shipments to be exported when their export association, ANSAC, takes consignment of the product at the Wyoming plant sites. Transit times between the plant and port, which can be about 2 to 3 weeks before the cargo is actually exported and carryover export inventories contribute to the discrepancy between reported and apparent consumption as well.

In the domestic market, large-volume buyers of soda ash were primarily the major glass container manufacturers whose purchases were seasonal (more beverage containers are made in the second and third quarters for summertime beverage consumption). Soda ash sales to the flat glass sector depended more on the state of the economy because the leading uses of flat glass were in automobile manufacture and in residential housing and commercial building construction. These two major industrial sectors are especially sensitive to changing economic conditions, and soda ash sales follow trends in the two sectors. The distribution of soda ash by end use in 2008 was glass, 48%; chemicals, 29%; soap and detergents, 10%; distributors, 4%; miscellaneous uses, 3%; and flue gas desulfurization, pulp and paper, and water treatment, 2% each.

Chemicals.—Soda ash is used to manufacture many sodium-base inorganic chemicals, including sodium bicarbonate, sodium chromates, sodium phosphates, and sodium silicates.

Glass.—Glass manufacture represented about 48% of domestic soda ash consumption as follows: container, 51%; flat, 37%; fiber, 7%; and specialty, 5%. Glass containers are made for beverages (beer, carbonated, and noncarbonated drinks), chemical and household products, food, liquor, medical products, and toiletries and cosmetics. In 2008, about 34.1 billion glass containers were manufactured, of which 60% were for beer bottles, 16% for food containers, 8% for beverage containers, 6% for wine containers, 4% for miscellaneous containers (chemicals, cosmetics, health, household, industrial, medicinal, and toiletries), and 3% each for liquor and ready-to-drink alcoholic coolers and cocktail containers.

Soaps and Detergents.—Detergents were the third ranked use of soda ash. Soda ash was used as a builder to emulsify oil stains, to reduce the redeposition of dirt during washing and rinsing, to provide alkalinity for cleaning, and to soften laundry water. In addition, soda ash was a component of sodium tripolyphosphate (STPP), another major builder in detergent

formulations. Soda ash consumption has been decreasing because phosphatic detergents can contribute to eutrophication, which is an environmental concern. Many regions of the Nation have adopted phosphate limitations or bans, affecting about 40% of the U.S. population. A strong U.S. economy boosted demand for industrial and institutional cleaners and automatic dishwashing detergents in the past several years. New technology incorporating enzymes in dishwashing detergents and a move toward liquid cleansers, however, may adversely affect STPP consumption in the future.

In response to the environmental concern that cardboard detergent packaging contributes to the volume of landfill waste, detergent manufacturers changed formulations to make compact and superconcentrated products. These reformulations required sodium silicates and synthetic zeolites, which are made from soda ash. Liquid detergents, which do not contain any soda ash, competed with powdered detergents and commanded about 50% of the household laundry detergent market in 2008.

Stocks

Yearend 2008 stocks of dense soda ash in domestic plant silos, terminals, warehouses, and on teamtracks amounted to 259,000 metric tons (t). Producers indicated that a potential supply problem could exist if inventories fell below 180,000 t. Most consumers of soda ash did not have the storage facilities to accommodate large quantities of soda ash and had to rely on suppliers to provide the material on a timely basis.

Prices

The average annual value in 2008 for bulk, dense natural soda ash, free on board (f.o.b.) Green River, WY, and Searles Valley, CA, was \$134.60 per metric ton (\$122.11 per short ton), which was a record high, eclipsing the previous record set in 2007 that was \$114.12 per ton (\$103.53 per short ton). Part of the price increase was because a few of the low-priced, long-term contracts (legacy agreements) with certain customers expired and were renegotiated at higher prices. The value is not a “price,” but rather the value of the combined revenue of California and Wyoming bulk, dense soda ash sold on an f.o.b. plant basis at list, spot, or discount prices, on long-term contracts, and for export, divided by the quantity of soda ash sold. Only merchant soda ash is used to derive the annual value; therefore, no soda ash for value-added products or soda liquors is included. The list prices quoted in trade journals or by producers differed from the annual average values reported to and by the USGS.

High energy and transportation costs caused soda ash prices to soar beginning in 2005 and continuing through 2008. To help offset the escalating energy and transportation costs, the domestic soda ash industry was forced to raise prices again in 2008.

General Chemical (Soda Ash) Partners raised its list price of soda ash effective May 5, by \$75 per short ton to \$260 per short ton. The off-list price for bulk and packaged soda ash would increase \$50 per short ton (General Chemical Industrial Products, 2008a). On May 14, FMC raised its list price and off-list price by \$50 per short ton effective July 1, or as contract terms permitted. The list price which had been \$170 per short

ton for bulk, dense soda ash, f.o.b. Green River, WY, increased to \$220 per short ton (FMC Corp., 2008a). OCI and Solvay followed soon after with similar price increases.

A second round of price increases was made on August 22, by General Chemical. Effective immediately or as contacts permitted, the off-list price would increase by \$40 per short ton for all bulk and packaged products. On August 29, FMC also announced a \$40 per short ton increase in the off-list price of soda ash effective October 1 or as contracts permitted (FMC Corp., 2008b; General Chemical Industrial Products, 2008b). Solvay also raised its off-list price of soda ash by \$40 per short ton on September 3 to be effective immediately or as contacts permitted. Many soda ash contracts are negotiated in November and December for the following year.

Because the price of natural gas remained high in 2008, all the producers maintained an energy surcharge on soda ash sales. Depending on the company, the surcharges were adjusted either monthly [based on the last quoted New York Mercantile Exchange (NYMEX) Henry Hub closing price for the next forward month] or quarterly (based on the 3-month forward average NYMEX gas price using the closing price as of the 15th of the month prior to the beginning of each calendar quarter). The surcharges were expected to remain in effect as long as the price of natural gas was between \$5.00 and \$8.00 per million British thermal units.

Foreign Trade

The majority of U.S. soda ash exports were controlled by ANSAC. It is involved exclusively in the export trade of soda ash, defined as an alkali product designated by the chemical formula Na_2CO_3 , whether manufactured by brine evaporation and purification, Solvay process, trona refining, or any other means. Under the Treaty of Rome agreement (1958), ANSAC is not permitted to ship soda ash to the European Union (EU); however, the members of the U.S. soda ash industry formed another organization for shipping to this region. It is the American-European Soda Ash Shipping Association, Inc. (AESSA) that is engaged solely in storage, transportation, and other related logistical and technical support activities to promote and further its members' individual commerce in soda ash being shipped to the EU. Both ANSAC and AESSA were formed as Webb-Pomerene export associations under the authority of the U.S. Federal Trade Commission.

According to the U.S. Census Bureau, U.S. soda ash exports for 2008 were a record 5.37 Mt, which represented about 48% of U.S. soda ash production. For comparison, exports accounted for only 5% of U.S. production in 1970, 13% in 1980, 26% in 1990, and 38% in 2000. In 2008, the regional percentage distribution of U.S. exports to 69 countries was South America, 28%; North America, 25%; Asia, 23%; Europe, 12%; the Middle East, 5%; Oceania, 3%; Africa and Central America, 2% each. Exports to the Caribbean were negligible (table 6). The average free alongside ship value was \$174.86 per ton in 2008 compared with \$143.02 per ton in 2007. Although the data in tables 1 and 6 are rounded to three significant digits, the unit values listed in table 6 are based on the unrounded statistics. The 10 leading countries, representing 70% of total U.S. soda ash exports, in decreasing order and percentage of total were Mexico, 19%; Brazil, 12%;

Canada, 7%; Venezuela, 6%; Indonesia, 6%; Chile, 6%; Taiwan, 4%; Japan, 4%; Thailand, 3%; and Australia, 3%. About 39% of all U.S. soda ash exports went through the Columbia-Snake River customs district in Idaho, Oregon, and Washington, the Port Arthur, TX, customs district was the second ranked customs district with 27% of the total, and the Laredo, TX, customs district was third, with 16% of the total (table 5).

Imports of soda ash increased slightly to nearly 13,000 t from 12 countries according to U.S. Census Bureau data. The majority of imports historically came from Canada, where General Chemical had operated a synthetic soda ash plant in Amherstburg, Ontario, until April 2001. The facility produced dense and light soda ash, the majority of which was light soda ash exported to the United States. In 2008, about 33% of soda ash imports were from China, 22% from Mexico, 18% from the United Kingdom, and 16% was from Japan. The remaining 11% of imports was from Belgium, Canada, France, Germany, Hong Kong, India, Romania, and Ukraine. The average cost, insurance, and freight value of imported soda ash was \$296.22 per ton, and the customs value was \$239.50 per ton.

World Review

Soda ash is a mature commodity in which consumption tends to grow in proportion to population and gross domestic product growth rates. For this reason, the leading customers of soda ash were, for the most part, developed nations with lower growth rates compared with developing countries. The developing nations tend to use less soda ash than developed nations but have higher growth rates. Although the production and consumption quantities varied among the countries, the end-use patterns were basically the same: glass, chemicals, and detergents were the major sectors.

In 2008, world soda ash production was estimated to be 45.5 Mt, which was a slight increase compared with that of 2007. Of the 30 countries that produce natural and synthetic soda ash, the United States is the world's second leading producer, accounting for 25% of total world output. Only Botswana, China, Ethiopia, Kenya, and the United States produce soda ash from natural sources; the remaining 25 nations manufacture soda ash through various chemical processes, primarily the Solvay process. Total world natural soda ash production represented about 28% of combined world soda ash production.

Seven countries produced more than 1 Mt of soda ash annually. They were, in descending order, China, the United States, Russia, Germany, India, Poland, and France. Bulgaria, Romania, and Ukraine had production installations that were rated at about 1 Mt/yr; adverse economic conditions, however, caused these nations to produce below their facilities' design capacities. The five top total soda ash producing nations, in descending order of production, are China, the United States, Russia, Germany, and India. These five countries accounted for 74% of world production in 2008.

Egypt.—In September, Solvay et Cie of Belgium purchased for \$140 million an 80% share of Alexandria Sodium Carbonate Company, the state-owned Egyptian soda ash producer. The synthetic soda ash plant produces about 130,000 t annually but Solvay planned to increase annual production to 200,000 t and eventually to 500,000 t (Middle East Business Intelligence, 2008).

Saudi Arabia.—General Chemical (Soda Ash) Partners [General Chemical (75%) and Owens-Illinois Inc. (25%)] agreed to a joint venture with Saleh & Abdulaziz Abahsain Co. Ltd. of Saudi Arabia to construct a 1-Mt/yr-capacity soda ash operation in Saudi Arabia (Middle East-North Africa Financial Network, 2008). The plant will use local salt and limestone to manufacture soda ash. The first phase of the construction was planned for 2010 (AME Info, 2008).

Tanzania.—In 2007, Tata Chemicals of India planned to develop the natural soda ash deposit at Lake Natron that is the breeding ground to 75% of the world's Lesser Flamingo population. The proposed project would produce 500,000 t/yr of soda ash; however, there were concerns about the plant's environmental impact on the flamingos and the region's \$932 million tourism industry. After many meetings with environmental groups, Tata withdrew its plans to construct the soda ash facility at the proposed location. The company was considering moving the proposed project elsewhere on Lake Natron (Afrol News, 2008).

Outlook

The international economic problems that began in 2008 affected soda ash-consuming industries. This decrease in soda ash consumption was expected to cause domestic and foreign soda ash producers to reduce soda ash production. Because the glass container sector is the leading soda ash-consuming sector, the demand for soda ash for glass containers may decline as consumers slowly accept their food and beverages packaged in the newer polyethylene terephthalate (PET) containers. Three dominant groups have survived to become the world leaders in soda ash—Solvay S.A. of Belgium, ANSAC of the United States (which represents four of the five domestic producers), and Chinese producers. India has emerged recently as a major leader in world soda ash production as well and will probably compete in the export markets with the other groups.

The outlook for U.S. soda ash production for the next 3 years is for continued growth despite global economic problems even though production in 2009 may decrease because of reduced export sales. The United States will continue to compete with Chinese soda ash producers in the Far Eastern markets. U.S. soda ash exports in 2010 may increase causing domestic soda ash production to increase by 0.5% per year. Growth in world consumption is forecast to range from 2.0% to 2.5% per year for the next several years. Asia and South America remain the likeliest areas for increased soda ash consumption in the near future.

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TABLE 1
SALIENT SODA ASH STATISTICS¹

(Thousand metric tons and thousand dollars except average annual value)

	2004	2005	2006	2007	2008
United States:					
Production:					
Soda ash:					
Quantity	11,000	11,000	11,000	11,100	11,300
Value	770,000	968,000	1,170,000	1,260,000	1,520,000
Value, average annual:					
Per short ton	\$63.75	\$80.19	\$96.64	\$103.53	\$122.11
Per metric ton	\$70.27	\$88.39	\$106.53	\$114.12	\$134.60
Wyoming trona	16,500	17,000	16,700	17,200	17,800
Exports:					
Quantity	4,670	4,680	4,820	5,130	5,370
Value	514,000	640,000	736,000	734,000	939,000
Imports for consumption:					
Quantity	6	8	7	9	13
Value	1,880	2,460	2,290	2,760	3,820
Stocks, December 31, producers ¹	338	243	290	206	259
Consumption:					
Apparent	6,290	6,380	6,100	6,030	5,860
Reported	6,260	6,200	6,110	5,940	5,730
World production ²	39,700	41,100 ^r	42,600 ^r	44,900 ^r	45,500

^eEstimated. ^rRevised.

¹Data are rounded to no more than three significant digits, except average annual value.

²Natural only; soda liquors and purge liquors are withheld to avoid disclosing company proprietary data.

TABLE 2
U.S. PRODUCERS OF SODA ASH IN 2008

(Million short tons unless otherwise noted)

Company	Plant nameplate capacity	Plant location	Source of sodium carbonate
FMC Wyoming Corp.:			
Granger ¹	1.30	Granger, WY	Underground trona.
Green River ²	3.55	Green River, WY	Do.
General Chemical (Soda Ash) Partners ³	2.80	do.	Do.
OCI Chemical Corp. ⁴	3.10	do.	Do.
Searles Valley Minerals, Inc. ⁵	1.45	Trona, CA	Dry lake brine.
Solvay Chemicals, Inc.: ⁶			
Green River	2.80	Green River, WY	Underground trona.
Parachute ⁷	1.00	Parachute, CO	Underground nahcolite.
Total	16.00		
Total	million metric tons	14.50	

Do., do. Ditto.

¹Tg Soda Ash Inc. was sold to FMC Wyoming Corp. in July 1999. About 500,000 short tons of idled capacity was brought back online by 2007.

²Formed joint venture (20%) in February 1996 with Sumitomo Corp. and Nippon Sheet Glass Co., Ltd., both of Japan.

³A joint venture between General Chemical Corp. (75%), Owens-Illinois, Inc. [acquired Australian Consolidated Industries International (ACI) in 1998] (25%), Tosoh Wyoming Inc. of Japan, which purchased part of ACI's 24% share in June 1992, sold its shares to General Chemical in August 2005.

⁴Rhône-Poulenc Basic Chemicals Co. of France sold its 51% share to DC Chemical Co., Ltd. [formerly Oriental Chemical Industries Chemical Corp. (OCI) of the Republic of Korea] on February 29, 1996; Anadarko Petroleum Corp., (acquired Union Pacific Resources Co. in 2000) owns 49%. An 800,000-short-ton expansion, brought onstream in November 1998, increased plant capacity to 3.1 million short tons per year; however, the company planned to take 900,000 short tons per year out of service temporarily for equipment refurbishment.

⁵IMC Global, Inc. acquired North American Chemical Co. in April 1998; operation sold in 2004 to Sun Capital Partners, Inc. (80.1%) with IMC retaining a 19.9% share. The entire operation was sold to Nirma Ltd. of India in November 2007.

⁶Solvay Soda Ash Joint Venture is owned by Solvay S.A. of Belgium (80%) and Asahi Glass Co. of Japan (20%), which became a partner in February 1990. Capacity increase of 272,000 metric tons per year (t/yr) (300,000 short tons per year) installed December 1995 and 454,000 t/yr (500,000 short tons per year) in October 2000. Company name changed to Solvay Chemicals, Inc. in 2003.

⁷Came onstream October 2000. A joint venture with Williams Sodium Products Co., [a wholly owned subsidiary of The Williams Companies, Inc. (60%) and American Alkali, Inc. (40%)]. Operation sold to Solvay America, Inc. on September 10, 2003. Soda ash plant idled.

TABLE 3
 REPORTED CONSUMPTION OF SODA ASH IN THE UNITED STATES, BY END USE, BY QUARTER¹

(Thousand metric tons)

NAICS ² code	End use	2007	2008		
			First quarter	Second quarter	Third quarter
3272	Glass:				
327213	Container	1,460	360	378	353
327211	Flat	1,080	253	250	252
327993	Fiber	210	49	45	47
327212	Other	154	40	33	39
	Total	2,900	702	705	692
32518	Chemicals	1,760	417	406	437
325611	Soaps and detergents	463	139	118	137
322	Pulp and paper	91	24	21	23
221310	Water treatment ³	98	21	23	22
56221	Flue gas desulfurization	130	30	30	39
422	Distributors	297	59	64	64
	Other	202	47	53	48
	Total domestic consumption ⁴	5,940	1,440	1,420	1,460
	Exports ⁵	5,250	1,250	1,280	1,250
	Canada	406	94	85	82
	Total industry sales ⁶	11,200	2,690	2,700	2,710
	Total sales from plants	11,200	2,770	2,800	2,760

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

²North American Industry Classification System.

TABLE 4
REGIONAL DISTRIBUTION OF U.S. SODA ASH EXPORTS, BY CUSTOMS DISTRICTS, IN 2008¹

(Metric tons)

Customs districts	North America	Central America	South America	Caribbean	Europe	Middle East	Africa	Asia	Oceania	Total	Percentage of total
Atlantic:											
Charleston, SC	--	--	--	--	853	--	--	12	--	865	(2)
Miami, FL	--	62	41	25	--	--	--	--	--	128	(2)
New York, NY	--	--	--	--	1,260	--	--	5	--	1,260	(2)
Norfolk, VA	--	--	--	--	818	--	--	--	--	818	(2)
Savannah, GA	--	196	--	--	--	--	--	5	--	201	(2)
Gulf:											
Houston-Galveston, TX	--	93	203	19	850	562	98	--	--	1,830	(2)
New Orleans, LA	--	34	--	--	--	--	27	--	--	61	(2)
Port Arthur, TX	--	22,300	950,000	4,420	400,000	--	92,700	--	--	1,470,000	27
Pacific:											
Anchorage, AK	90	--	--	--	--	--	--	24	--	114	(2)
Columbia-Snake River, ID-OR-WA	--	73,300	246,000	--	187,000	241,000	--	1,220,000	156,000	2,120,000	39
Los Angeles, CA	--	198	334,000	--	27,600	57	--	164	8,450	371,000	7
San Diego, CA	48,500	--	--	--	--	--	--	--	--	48,500	1
San Francisco, CA	--	--	--	--	154	1,490	--	--	--	1,640	(2)
Seattle, WA	18,800	--	--	--	--	--	--	--	--	18,800	(2)
North-central:											
Chicago, IL	--	--	--	--	101	--	--	93	--	194	(2)
Cleveland, OH	376	--	--	--	--	--	--	--	--	376	(2)
Detroit, MI	283,000	--	--	--	--	--	--	--	--	283,000	5
Duluth, MN	1,050	--	--	--	--	--	--	--	--	1,050	(2)
Great Falls, MT	54,800	--	--	--	--	--	--	--	--	54,800	1
Minneapolis, MN	89	--	--	--	--	--	--	--	--	89	(2)
Pembina, ND	6,920	--	--	--	--	--	--	--	--	6,920	(2)
Northeast:											
Buffalo, NY	22,900	--	--	--	--	--	--	--	--	22,900	(2)
Ogdensburg, NY	1,280	--	--	--	--	--	--	--	--	1,280	(2)
Portland, ME	943	--	--	--	--	--	--	--	--	943	(2)
Southwest:											
El Paso, TX	121,000	--	--	--	--	--	--	--	--	121,000	2
Laredo, TX	833,000	--	--	--	179	--	1,530	--	--	835,000	16
Nogales, AZ	20	--	--	--	--	--	--	--	--	20	(2)
Other, San Juan, PR	--	--	--	53	15	--	--	--	--	68	(2)
Unknown	739	--	--	--	--	--	--	--	--	739	(2)
Total	1,390,000	96,200	1,530,000	4,520	620,000	243,000	94,400	1,220,000	164,000	5,370,000	100
Percentage of total	25	2	28	0	12	5	2	23	3	100	XX

XX Not applicable. -- Zero.

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

²Less than ½ unit.

Source: U.S. Census Bureau, as adjusted by the U.S. Geological Survey using data and information from the Journal of Commerce PIERS trade service and industry sources.

TABLE 5
U.S. EXPORTS OF SODA ASH, BY COUNTRY¹

Country	2007			2008		
	Quantity (thousand metric tons)	Value ² (thousands)	Unit value	Quantity (thousand metric tons)	Value ² (thousands)	Unit value
Andorra	--	--	--	(3)	\$27	\$150
Angola	--	--	--	(3)	32	169
Argentina	98	\$14,023	\$143	110	22,915	208
Aruba	(3)	8	483	(3)	7	553
Australia	118	17,737	150	136	27,059	198
Bahrain	(3)	164	350	1	391	357
Belgium	186	28,742	155	185	27,224	147
Belize	--	--	--	(3)	3	2,008
Botswana	(3)	8	2,640 ^r	--	--	--
Brazil	518	70,629	136	646	123,488	191
Cameroon	(3)	61	522	(3)	21	542
Canada	443	61,880	140	389	57,636	148
Chile	302	43,139	143	301	53,240	177
China	41	5,174	126	(3)	93	484
Colombia	136	19,604	144	120	19,696	165
Costa Rica	25	3,813	153	25	4,752	190
Dominican Republic	3	375	125	4	1,671	374
Ecuador	16	2,177	136	17	2,898	166
El Salvador	9	1,350	150	8	1,426	188
Equatorial Guinea	--	--	--	(3)	3	1,295
Finland	(3)	26	517	(3)	16	225
France	60	7,983	133	59	8,222	140
Germany	(3)	278	443	1	270	415
Grenada	(3)	6	595	--	--	--
Guatemala	38	6,424	169	51	10,029	198
Guyana	--	--	--	(3)	9	612
Iceland	(3)	121	307	--	--	--
India	(3)	6	110	--	--	--
Indonesia	295	42,774	145	343	64,856	189
Ireland	(3)	7	1,630 ^r	1	92	110
Italy	(3)	75	196	1	195	329
Jamaica	(3)	18	431	(3)	13	524
Japan	279	34,808	125	211	32,698	155
Korea, Republic of	184	28,009	152	140	30,227	216
Lithuania	50	5,429	109	118	16,105	136
Malaysia	76	12,165	160	75	17,162	227
Mexico	880	128,663	146	1,004	169,709	169
Morocco	--	--	--	1	255	189
Netherlands	138	20,407	148	123	20,196	164
Netherlands Antilles	(3)	3	529	--	--	--
New Zealand	27	3,876	144	28	5,521	199
Nicaragua	(3)	17	110	(3)	6	110
Nigeria	--	--	--	(3)	5	439
Oman	(3)	184	375	1	323	344
Pakistan	(3)	4	3,560 ^r	(3)	17	1,002
Panama	10	1,448	145	13	2,544	197
Peru	44	6,984	159	40	7,400	186
Philippines	44	6,035	137	54	10,247	190
Portugal	27	2,902	107	29	3,274	112
Qatar	--	--	--	(3)	5	837
Russia	(3)	6	442	--	--	--
Saudi Arabia	122	16,667	137	140	24,168	173
Senegal	--	--	--	(3)	16	583
Sierra Leone	(3)	16	485	(3)	19	543
Singapore	--	--	--	(3)	71	764
Slovakia	--	--	--	(3)	29	498
South Africa	84	11,440	136	93	15,084	163
Spain	160	21,744	136	103	14,156	138
Suriname	(3)	3	110	--	--	--

See footnotes at end of table.

TABLE 5—Continued
U.S. EXPORTS OF SODA ASH, BY COUNTRY¹

Country	2007			2008		
	Quantity (thousand metric tons)	Value ² (thousands)	Unit value	Quantity (thousand metric tons)	Value ² (thousands)	Unit value
Sweden	(3)	4	3,870 ³	--	--	--
Switzerland	(3)	\$51	\$171	--	--	--
Taiwan	238	37,200	156	233	\$42,100	\$181
Thailand	148	20,800	140	145	25,200	173
Trinidad	--	--	--	(3)	4	543
United Arab Emirates	55	7,640	139	101	17,400	172
United Kingdom	(3)	61	521	(3)	12	1,020
Venezuela	264	39,100	148	297	54,100	182
Vietnam	11	1,550	141	20	4,810	3,410
Total	5,130	734,000	143	5,370	939,000	175

¹Revised. -- Zero.

²Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

³Free alongside ship value.

⁴Less than ½ unit.

Source: U.S. Census Bureau, as adjusted by the U.S. Geological Survey using data and information from the Journal of Commerce Port Import-Export Reporting Service and industry sources.

TABLE 6
U.S. PRODUCTION OF SODIUM COMPOUNDS, BY MONTH¹

(Thousand metric tons)

	2007		2008	
	Soda ash	Wyoming trona ²	Soda ash	Wyoming trona ²
January	864	1,420	922	1,510
February	880	1,400	878	1,370
March	962	1,590	955	1,510
April	880	1,450	890	1,530
May	950	1,460	987	1,490
June	926	1,310	935	1,480
July	985	1,500	912	1,200
August	971	1,490	976	1,630
September	890	1,110	935	1,490
October	920	1,450	996	1,560
November	903	1,450	965	1,530
December	936	1,510	917	1,510
Total	11,100	17,200	11,300	17,800

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

²Includes solution-mined trona.

TABLE 7
SODA ASH: ESTIMATED WORLD PRODUCTION, BY COUNTRY^{1,2}

(Thousand metric tons)

Country ³	2004	2005	2006	2007	2008
Argentina	--	86 ⁴	161 ⁴	70	70
Australia	300	300	310	310	310
Austria ⁵	150	100 ^r	--	--	--
Bosnia and Herzegovina	11	11	11	11	11
Botswana ⁶	263 ⁴	250	250	250	250
Brazil	200	200	200	200	200
Bulgaria	800	800	800	800	800
Chad ⁷	12	12	12	12	12
China	13,024 ⁴	14,210 ⁴	15,600 ⁴	17,720 ⁴	18,521 ⁴
Egypt	50	50	50	50	50
Ethiopia	6 ⁴	8 ⁴	4 ^r	-- ^r	--
France	1,000	1,000	1,000	1,000	1,000
Germany	1,438 ⁴	1,533 ⁴	1,515 ⁴	1,510 ^{R,4}	1,450
India	1,500	1,500	1,500	1,500	1,500
Iran	130	130	130	140	140
Italy	505	525	500	500	500
Japan	400	400	400	400	400
Kenya ⁶	354 ⁴	360 ⁴	374 ⁴	386 ⁴	513 ⁴
Korea, Republic of	310	310	310	310	310
Mexico	290	290	290	290	290
Netherlands	400	400	400	400	400
Pakistan	240	260	250	260	250
Poland	1,167 ⁴	1,189 ⁴	1,177 ⁴	1,192 ^{r,4}	1,200
Portugal	150	150	150	150	150
Romania	398 ^r	346 ^r	453 ^r	453 ^r	450
Russia	2,600	2,600	2,800	2,900	2,800
Spain	500	500	500	500	500
Turkey	846 ⁴	869 ^{r,4}	891 ^{r,4}	947 ^{r,4}	950
Ukraine	650	700	700	700	700
United Kingdom	1,000	1,000	900	900	500
United States ⁶	11,000 ⁴	11,000 ⁴	11,000 ⁴	11,100 ⁴	11,300 ⁴
Total	39,700 ^r	41,100 ^r	42,600 ^r	44,900 ^r	45,500

^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.

²Table includes data available through April 11, 2009. Synthetic unless otherwise specified.

³In addition to the countries listed, Tanzania may produce soda ash for local consumption; available general information is inadequate for the formulation of reliable estimates of output levels.

⁴Reported figure.

⁵Plant closed in 2005; production discontinued.

⁶Natural only.

⁷Produced for local consumption only.