SODA ASH

(Data in thousand metric tons, unless otherwise noted)

<u>Domestic Production and Use</u>: Four companies in Wyoming operating five plants and one company in California with one plant composed the U.S. soda ash (sodium carbonate) industry, which was the largest in the world. The five producers, with a combined annual nameplate capacity of 13 million tons, operated at 78% of nameplate capacity. Sodium bicarbonate, sodium sulfate, potassium chloride, potassium sulfate, borax, and other minerals were produced as coproducts from sodium carbonate production in California. Sodium bicarbonate, sodium sulfite, sodium tripolyphosphate, and chemical caustic soda were manufactured as coproducts at several of the Wyoming soda ash plants. The total estimated value of domestic soda ash produced in 1999 was \$800 million.¹

Based on final 1998 data, the estimated 1999 reported distribution of soda ash by end use was glass, 49%; chemicals, 27%; soap and detergents, 11%; distributors, 5%; flue gas desulfurization, 3%; pulp and paper and water treatment, 2% each; and other, 1%.

Salient Statistics—United States:	<u> 1995</u>	<u> 1996</u>	<u> 1997</u>	<u>1998</u>	<u>1999</u> °
Production ²	10,100	10,200	10,700	10,100	10,100
Imports for consumption	83	107	101	83	85
Exports	3,570	3,840	4,190	3,660	3,550
Consumption: Reported	6,500	6,390	6,480	6,550	6,610
Apparent	6,510	6,470	6,620	6,560	6,610
Price: Quoted, yearend, soda ash, dense, bulk,					
f.o.b. Green River, WY, dollars per short					
ton	105.00	105.00	105.00	105.00	105.00
F.o.b. Searles Valley, CA, same basis	130.00	130.00	130.00	130.00	130.00
Average sales value (natural source),					
f.o.b. mine or plant, same basis	74.50	82.60	77.25	75.30	72.00
Stocks, producer, yearend	306	271	259	273	300
Employment, mine and plant, number	2,800	2,800	2,800	2,700	2,600
Net import reliance ³ as a percent of					
apparent consumption	Е	E	E	E	Е

Recycling: There is no recycling of soda ash by producers; however, glass container producers are using cullet glass, thereby reducing soda ash consumption.

Import Sources (1995-98): Canada, 99%; and other, 1%.

Tariff: Item Number Normal Trade Relations

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Disodium carbonate 2836,20,0000 1,2% ad val.

Depletion Allowance: 15% (Domestic and foreign); for natural only.

Government Stockpile: None.

Events, Trends, and Issues: The economic problems in Asia that began in 1997 and continued in 1999 reduced U.S. soda ash exports; however, China increased its soda ash exports to local Asian consumers. A buildup of excess soda ash supplies in China prompted producers to reduce inventories by exporting the surplus at reduced prices. Also, China began preliminary discussions about forming an export association that would manage the handling and distribution of soda ash shipment by the majority of the Chinese soda ash industry. In November, the Chinese hosted an international synthetic soda ash conference to promote the activities of its industry. The synthetic soda ash producer in England, which had previously purchased its rival soda ash plant in the Netherlands, was itself acquired by a group of U.S. investors, including a major bank.

A U.S. soda ash producer in Wyoming was sold at midyear to the largest domestic soda ash producer that also had a plant in Wyoming. The acquisition was done to strengthen the competitive position of the latter and gain access to the former's trona resources adjacent to their mine.

A new glass container was introduced that could affect consumption of soda ash in glass manufacture. The largest glass container manufacturer in North America developed a new lightweight glass bottle known as the Duraglass XLTM bottle, that reduces the amount of glass required to make a typical bottle, resulting in faster and more cost effective

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production of containers, reduced energy consumption, and lower transportation costs. Furthermore, raw material requirements reportedly are reduced 10% to 20%, which will further reduce soda ash sales to this sector. The company dedicated two production lines for this new container at its Streator, IL, plant but plans to install the process at some of its other locations as the new container gains acceptance. A major brewery was listed as one of first customers to use this new glass bottle at its Milwaukee, WI, plant. The new bottles are 100% recyclable.

World soda ash consumption is forecast to remain favorable into the next century because of growing demand for soda ash in developing nations, especially in the Far East and in South America. Exports will continue to be the most important market for increased U.S. soda ash sales. Consolidation within the U.S. soda ash industry will reduce the number of suppliers but should strengthen soda ash sales and prices. Soda ash consumption in glass containers will probably continue to decline as lightweight bottles and plastic containers displace the quantity of new raw materials for glass manufacture.

Notwithstanding the economic problems in certain regions, the overall world demand for soda ash is expected to grow 1.5% to 2% annually in the early part of the next century. Domestic demand should be slightly higher in 2000.

World Production, Reserves, and Reserve Base:

	Production		Reserves ^{4 5}	Reserve base⁵
Natural:	<u> 1998</u>	<u>1999</u> °		
United States	10,100	10,100	⁶ 23,000,000	639,000,000
Botswana	200	190	400,000	NA
Kenya	200	200	7,000	NA
Mexico			200,000	450,000
Turkey	_		200,000	240,000
Uganda	NA	NA	20,000	NA
Other countries			260,000	220,000
World total, natural (may be rounded)	10,500	10,500	24,000,000	40,000,000
World total, synthetic (rounded)	21,200	21,300	_	_
World total (rounded)	31,700	31,800	_	_

World Resources: Soda ash is obtained from trona and sodium carbonate-rich brines. The world's largest deposit of trona is in the Green River Basin of Wyoming. About 47 billion metric tons of identified soda ash resources could be recovered from the 56 billion tons of bedded trona and the 47 billion tons of interbedded or intermixed trona and halite that are in beds more than 1.2 meters thick. About 34 billion tons of reserve base soda ash could be obtained from the 36 billion tons of halite-free trona and the 25 billion tons of interbedded or intermixed trona and halite that are in beds more than 1.8 meters thick. Underground room-and-pillar mining, using a combination of conventional, continuous, and shortwall mining equipment is the primary method of mining Wyoming trona ore. The method has an average 45% mining recovery, which is higher than the 30% average mining recovery from solution mining. Improved solution mining techniques, such as horizontal drilling to establish communication between well pairs, could increase this extraction rate and enable companies to develop some of the deeper economic trona. Wyoming trona resources are being depleted at the rate of about 15 million tons per year (8.3 million tons of soda ash). Searles Lake and Owens Lake in California contain an estimated 815 million tons of soda ash reserves. There are at least 62 identified natural sodium carbonate deposits in the world, some of which have been quantified. Although soda ash can be manufactured from salt and limestone, both of which are practically inexhaustible, synthetic soda ash is more costly to produce and generates environmentally deleterious wastes. Commercial mining of nahcolite is presently being done by one producer in Colorado, and two other companies are trying to obtain financing for development of competing nahcolite projects. None of the ventures are associated with oil shale mining or with dawsonite recovery.

<u>Substitutes</u>: Caustic soda can be substituted for soda ash in certain uses, particularly in the pulp and paper, water treatment, and certain chemical sectors. Soda ash, soda liquors, or trona can be used as feedstock to manufacture chemical caustic soda, which is an alternative to electrolytic caustic soda.

^eEstimated. E Net exporter. NA Not available.

¹Does not include values for soda liquors and mine waters.

²Natural only

³Defined as imports - exports + adjustments for Government and industry stock changes.

⁴The reported quantities are sodium carbonate only. About 1.8 tons of trona yields 1 ton of sodium carbonate.

⁵See Appendix C for definitions.

⁶From trona, nahcolite, and dawsonite sources.