SODA ASH

(Data in thousand metric tons, unless noted)

<u>Domestic Production and Use</u>: Five companies in Wyoming and one in California composed the U.S. soda ash (sodium carbonate) industry, which was the largest in the world. The six producers, with a combined annual nameplate capacity of 11 million tons, operated at 89% 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 1995 was \$750 million.¹

The reported distribution of soda ash by end use was glass, 51%; chemicals, 22%; soap and detergents, 13%; distributors, 5%; miscellaneous, 3%; and pulp and paper, water treatment, and flue gas desulfurization, 2% each.

Salient Statistics—United States:	<u> 1991</u>	<u> 1992</u>	<u> 1993</u>	<u> 1994</u>	<u>1995</u> °
Production ²	9,000	9,380	8,960	9,320	9,800
Imports for consumption	134	72	89	79	80
Exports	2,730	2,960	2,800	3,230	3,600
Consumption: Reported	6,280	6,320	6,310	6,240	6,280
Apparent	6,460	6,360	6,350	6,260	6,280
Price: Quoted, yearend, soda ash, dense, bulk,					
f.o.b. Green River, WY, dollars per short ton	98.00	98.00	98.00	105.00	105.00
F.o.b. Searles Valley, CA, same basis	123.00	123.00	123.00	130.00	130.00
Average sales value (natural source),					
f.o.b. mine or plant, same basis	84.18	80.93	74.34	70.44	76.00
Stocks, producer, yearend	234	371	274	203	200
Employment, mine and plant	2,800	2,800	2,800	2,800	2,800
Net import reliance ³ as a percent of					
apparent consumption	Е	Е	Е	Е	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 (1991-94): Canada, 99%; and other, 1%.

<u>Tariff</u> : Item	Number	Most favored nation (MFN)	Non-MFN ⁴	
		<u>12/31/95</u>	<u>12/31/95</u>	
Disodium carbonate	2836.20.0000	1.2% ad val.	8.5% ad val.	

Depletion Allowance: 14% (Domestic), 14% (Foreign). For natural only.

Government Stockpile: None.

Events, Trends, and Issues: In February, a large section of one Wyoming mine collapsed and generated a seismic event that had a 5.2 magnitude on the Richter scale. The accident temporarily resulted in a short-term supply disruption that was soon overcome. The cause of the catastrophe was still under investigation by yearend.

In April, the European Union Commission issued provisional antidumping duties on imports of U.S. soda ash after a 2-year investigation. The duties ranged from 0% to 14.3%, depending on the producer. European glass manufacturers and U.S. soda ash producers lobbied the Commission to reduce or rescind the duties. In October, the definitive duties that replaced the provisional ones were lowered ranging from 0% to 8.9%. Furthermore, the duties will be reevaluated after 1 year rather than the customary 5 years. Despite this favorable ruling, U.S. soda ash demand was forecast to remain strong throughout 1996 without any significant exports to Europe.

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Because of strong export sales and increased domestic soda ash consumption in the flat glass, chemical, and pulp and paper sectors, the industry raised its off-list price of soda ash by \$15 per short ton, effective July 1. Several small accounts and some quarterly contracts were the primary targets for the action. Larger buyers with long-term contracts that are negotiated by yearend may have to pay more for their soda ash in 1996 because supplies may be limited due to increased demand.

The outlook for soda ash through 1996 is extremely favorable. Opportunities for additional shipments to Europe appear optimistic, beginning possibly as early as 1997, as European soda ash demand continues to grow.

World Production, Reserves, and Reserve Base:

	Production		Reserves ⁵ ⁵	Reserve base ^o
Natural	<u> 1994</u>	<u>1995</u> ⁰		
United States	9,320	9,800	⁷ 23,000,000	⁷ 39,000,000
Botswana	140	100	400,000	NA
Chad	NA	NA	7,000	NA
Kenya	245	250	50,000	NA
Mexico	_		200,000	450,000
Turkey	_		200,000	240,000
Uganda	NA	NA	20,000	NA
Other countries	<u>_</u>		260,000	220,000
World total, natural (rounded)	9,700	10,200	24,000,000	40,000,000
World total, synthetic (rounded)	21,000	21,000	_	_
World total (rounded)	31,000	31,000	_	

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 trona⁵ 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 and Owens Lakes 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.

⁴See Appendix B.

⁵The reported quantities are sodium carbonate only. About 1.8 tons of trona yields 1 ton of sodium carbonate.

⁶See Appendix C for definitions.

⁷From trona, nahcolite, and dawsonite sources.