

ZINC

By Jozef Plachy

Domestic mine production rose nearly 8% in 1995. Zinc was extracted from 21 mines in 8 States. (See tables 2 and 3.) For the fifth consecutive year, Alaska was the leading zinc mining State, followed by Tennessee, New York, Missouri, Montana, and Colorado. As U.S. mine production greatly exceeds smelter capacity, more than two-thirds of the mined zinc was exported in concentrate. The value of zinc mine production in 1995, based on the recoverable content and the average annual U.S. price, was about \$800 million.

Zinc production from domestic and imported ore by the three primary smelters/refineries in 1995 was 7% higher than in 1994. (See table 4.) Production of slab zinc from eight secondary sources declined by 6%.

Apparent consumption of slab zinc increased by 5% in 1995, while consumption of zinc in all forms increased by 4%. To meet the growing demand, imports of slab zinc grew by nearly 8%.

U.S. producer prices, which are based on the London Metal Exchange (LME) daily price and include a premium, continued to rise for the second consecutive year. The LME price of refined zinc in 1995 declined from 52.47 cents per pound in January to 44.43 cents per pound in October. Because of changing premiums, the U.S. producer prices, during the same time period, fell from 60.85 cents per pound to 49.68 cents per pound. The average LME price for 1995 was 3.5% higher than in 1994 and more than 7% higher than in 1993. (See table 1.)

World mine production increased in 1995 by about 1.4% to 7.1 million tons. The five leading producers, Australia, Canada, China, Peru, and the United States, accounted for about 61% of total world production. (See table 14.) Total world slab zinc production increased by about 1.5%, to 7.5 million tons in 1995, failing to keep pace with the rise in total zinc consumption, which, according to the International Lead and Zinc Study Group, rose 5.4%, to 7.4 million tons. Canada, China, Japan, and the United States accounted for about 38% of total world zinc metal production. (See table 15.) As world consumption outpaced metal production, LME stocks of refined zinc declined from 1.2 million tons at the beginning of 1995 to 0.7 million tons at yearend. Total world stocks were down by 29%, to 1.3 million tons at yearend, equivalent to less than 11 weeks of consumption. Identified world zinc resources were about 1.8 billion tons. The world reserve base was estimated at 400 million tons and reserves at 150 million tons. The United States had the largest reserves and reserve base at 11% and 15% of the world totals, respectively.

Legislation and Government Programs

The United States has maintained a stockpile of zinc for

national defense purposes for more than 50 years. In 1992, the President signed Public Law 102-484, which authorized the disposal of the entire inventory of zinc from the National Defense Stockpile (NDS). The Defense Logistics Agency (DLA), which maintains the NDS, was authorized to sell 45,360 tons of zinc metal in fiscal year (FY) 1995 (October 1, 1994 to September 30, 1995). The authorization included a provision to prevent sales if the market price fell more than 5% from the date of enactment. Because of this stipulation, only 14,087 tons of zinc metal was sold in calendar 1995. The inventory on December 31, 1995, was 272,303 tons.

The Environmental Protection Agency (EPA) ruled in May 1995 that electric arc furnace (EAF) dust can be dumped in municipal landfills rather than in hazardous waste sites if the material has been treated to stabilize it. This is expected to reduce the cost of disposal, making recovery less attractive. In response to tightening environmental requirements in the 1980's, the amount of EAF dust treated at secondary zinc smelters rose from 6,000 tons in 1981 to 300,000 tons in the early 1990's, yielding 60,000 tons of zinc metal annually. As a result of the EPA ruling, this rising trend may be reversed in spite of the high content of zinc (up to 25%) in EAF dust.

Production

Mine Production.—U.S. zinc mine output, expressed in recoverable zinc content, increased by 8% in 1995, to 614,000 tons. The 44,000-ton increase was mainly due to a 31,000-ton boost in Red Dog Mine production. (See table 1.)

The 1995 production of zinc ore at the Red Dog Mine, operated by Cominco Ltd.'s subsidiary, Cominco Alaska, increased by more than 6%, to 2.2 million tons. Ore was milled year-round and trucked 85 kilometers from the mine to the port site on the Chukchi Sea and stored until the summer months, when the 3-month-long shipping season occurs. Zinc concentrate production totaled 585,200 tons, a 10% increase over the 1994 level. For the first time in its 6-year operating life, Red Dog recorded an operating profit in 1995. In the same year, Red Dog's ore reserves were augmented by the discovery of a new ore body, amenable to open pit mining, north of the current open pit. It contains an estimated 76 million tons of inferred ore, grading 13.7% zinc and 3.6% lead. The total ore reserves and resources at Red Dog are now estimated at 138 million tons grading 16.2% zinc and 4.4% lead, making it the largest zinc ore body in the world.¹ Future plans include processing 3.2 million tons of ore annually by 1998, producing 820,000 tons of zinc concentrate. To accommodate increased concentrate production, the lead-zinc smelter in Trail, Canada, will be enlarged by 18,000 tons to an annual capacity of

290,000 tons of refined zinc.

The U.S. operation of Savage Zinc Inc., a subsidiary of Savage Resources Limited, of Australia, consists of three underground mines and concentrators (Elmwood-Gordonsville, Clinch Valley, and Jefferson City), an underground mine (Cumberland), and an electrolytic zinc refinery (Clarksville), all in Tennessee. The company's exploration program at Elmwood-Gordonsville, Cumberland, and Clinch Valley mines resulted in a 13% increase in proven and probable reserves. In June 1995, the end of the fiscal year, reserves amounted to more than 23 million tons, containing 3.19% zinc.² The annual production of almost 104,000 tons of refined zinc metal in 1995 was equivalent to nearly 30% of domestic production and about 7% of total U.S. demand. Profitability of the Clarksville refinery was aided by high value byproducts, mainly germanium, and high capacity utilization - operating at about 125% of nominal capacity.

ASARCO Incorporated operated four zinc mines near Knoxville, TN, all of which, according to Asarco's Annual Report, were operating at a loss in 1995 owing to low ore grades. In addition, Asarco also produced zinc as a coproduct at its two wholly owned lead mines in Missouri and its partly owned Leadville Mine in Colorado. The total 1995 production of zinc from all these mines was 128,200 tons, of which Asarco's share was 119,400 tons, slightly less than in 1994. The company's total zinc reserves amounted to 24.1 million tons.

In 1995, production at the Montana Tunnels Mine reached a record level of 5.1 million tons of ore mined, which yielded 21,600 tons of zinc in concentrate, a 9% increase over production in 1994. Profitability of the mine, owned by Pegasus Gold, Inc., was assured by lower operating cost, record gold production, and high silver and lead output.

On May 17, Kennecott (70.3%) and Hecla Mining Co. (29.7%) announced the redevelopment of the jointly owned Greens Creek zinc-lead-silver-gold mine near Juneau, AK. Production had been suspended in 1993 because of low ore grades and declining metal prices. According to a press release, recent exploration defined a high grade ore body, enabling annual production of 35,800 tons of zinc in concentrate. Production is to start in 1997 and last for 18 years.

After temporary closure, Hecla's Lucky Friday Mine in Idaho returned to full production early in 1995. About 83% of the contained zinc was recovered from 158,874 tons of ore produced by the underhand cut-and-fill method. The 1995 production of 2,999 tons of zinc in concentrate was about 24% higher than in 1994.³

Smelter and Refinery Production.—Domestic production of refined (slab) zinc in 1995 was 363,000 tons, up from 356,000 tons in 1994. (See table 1.) Primary slab zinc was produced at three smelter/refineries: Big River Zinc at Sauget, IL; Savage Zinc Inc. at Clarksville, TN; and Zinc Corp. of America (ZCA) at Monaca, PA. (See table 6.) Secondary slab zinc was produced at eight secondary smelters from waste and scrap materials. About 36% of slab zinc output in the United States is produced through secondary recovery, which is high

compared with 25% of world slab zinc production.

Most of the 353,000 tons of secondary zinc that was produced went into brass and bronze (134,000 tons), slab zinc (131,000 tons), and zinc oxide (33,600 tons). The remaining 54,000 tons went into zinc-based alloys, zinc dust, and zinc chemicals. The largest secondary producer was ZCA at its electrothermic smelter in Monaca. A substantial part of the plant's feed was crude zinc calcine recovered from steel EAF dust by its parent company, Horsehead Resources Development Co., Palmerton, PA. An average of about 15 kilograms of flue dust, containing about 23% zinc, arises per ton of EAF steel. Other major producers of zinc metal from secondary sources were Huron Valley Steel Corp., International Zinc Co., and Gulf Metals Corp.

Consumption

Domestic data for zinc consumption were developed by the U.S. Geological Survey from five separate, voluntary surveys of U.S. operations. Larger consumers were canvassed monthly, smaller ones annually. Consumption for nonrespondents was estimated on the basis of prior consumption and industry trends. Reported consumption of zinc for 1995 accounted for only 68% of apparent zinc metal consumption.

Apparent domestic consumption of slab zinc rose in 1995 by 59,000 tons to 1.24 million tons. Electroplating and hot dip galvanizing, mainly for sheet and strip, continued to be the principal use of zinc metal, consuming about one-half of total zinc production. Because the annual cost of metallic corrosion in the United States is estimated at about \$300 billion, galvanizing continues to be the fastest-growing application of zinc. It may account for more than 55% of consumption by the end of the decade, mainly because of the increased use of galvanized steel in residential construction. The second largest use of zinc was for zinc-based alloys, followed by brass alloys, consuming 23% and 11%, respectively. Most of the metal consumed in the United States was Special High Grade, followed by Prime Western and High Grade. Overall, zinc metal accounted for about 85% of the total zinc consumed in all its forms. (See tables 7 and 8.)

World consumption of refined zinc metal increased by 5.7% in 1995. The largest increase took place in Asia, and lesser increases in Europe and North America.

Stocks

In 1995, exports from the former Eastern Bloc began to fall, causing LME stocks to drop by 43%. Because producer, consumer, and merchant stocks changed only slightly, total refined metal inventories in the world at the end of 1995 stood at 1.3 million tons, or nearly twice the normal levels. For the next few years, zinc demand is expected to exceed supply, which will further erode the existing consumer, producer and merchant stocks, as well as reduce stock levels on the LME.

Prices

For the past 5 years, U.S. zinc producers and traders have used the LME price as their price basis, adding either a premium, or a fee for delivery and/or importing costs. The premium in 1995 fluctuated between \$0.04 and \$0.07 per pound over the LME spot price, while the amount of the fee reflected the place of origin and cost of delivery. The price reported in table 1 was published by *Platt's Metals Week*, which based its price on the daily LME spot price for Special High Grade plus a premium that reflected market conditions.

While domestic price continued the slow annual increase that began in 1993, the 1995 price reflected the changing fortunes of the zinc market. After a peak in January, it declined below \$0.50 per pound in October, and finished the year about \$0.10 below January price.

Foreign Trade

The United States remained dependent on imports of slab zinc in 1995; imports were equivalent to nearly 70% of the apparent consumption. The majority of slab zinc imports was provided by Canada's Cominco, produced at Trail, BC, from concentrates from Alaska's Red Dog Mine. Imports of slab zinc in 1995 increased by 62,569 tons, reflecting expanded consumption of zinc metal and increased shipments of zinc concentrates from the Red Dog Mine for processing at Trail and subsequent export as slab zinc to the United States. (*See tables 11, 12 and 13.*)

World Review

Canadian miner Cambior Inc. opened two mines in Quebec. In January 1995 it reopened the Bouchard-Hébert Mine (formerly Moburn Mine) and by yearend the production had reached 23,642 tons of zinc in concentrate. Proven and probable mining reserves were estimated at more than 10 million tons, grading 4.31% zinc.⁴ Cambior's other venture included the new Grevet polymetallic project, where milling operations began in late December. Annual production in 1996 was projected at 62,000 tons of zinc in concentrate. Proven, probable, and possible mining reserves were estimated at nearly 11 million tons at a grade of 8.5% zinc, plus copper, gold, and silver.

Other developments in Canada included the opening of the Photo Lake copper-zinc mine in Manitoba by Hudson Bay Mining and Smelting Co. Ltd.; the opening of the Grum Mine and the reopening of the Vangorda Mine at Fargo, Yukon Territory, by Anvil Range Mining Corp. and partner Hyundai Corp. of the Republic of Korea; the reopening of the Westarm copper-zinc mine near Flin Flon in Manitoba, which had been dormant for 9 years; the start of development of the Pick Lake deposit by Inmet Mining, opening of which should coincide with exhaustion of the company's nearby Winston Lake ore body; and the closure of the Geco copper-zinc-silver mine in northwestern Ontario, which started production in 1957.

In 1995, European zinc producers undertook numerous negotiations to reduce metal production in order to ease the surplus in the European market. Results were inconclusive, because some participants took the view that a voluntary shutdown was unnecessary, given that a number of plants appeared to be on the brink of closure because of high operating cost caused by rising environmental expenditures, high wages, and expensive power. Instead of closing, most producers only restructured their operations, while some of the others actually increased their production. Spain's Asturiana de Zinc, S.A. (AZSA) expanded the capacity of the Aviles smelter by 50,000 tons in 1995, to 350,000 tons per year. As part of restructuring, AZSA separated the management of its mining activities (principally Reocin) from roasting and smelting operations. One-third of the concentrate was sourced from its own Reocin Mine and the rest was imported, mostly from Canada. More than 70% of AZSA's output was exported, mainly to Japan and the United States.

The development of Arcon International Resources' Galmoy lead-zinc mine in Ireland began in May 1995. Only about 3% of the property's 14 square kilometers (4,200 acres) were explored prior to the start of construction. Reserves at the two shallow, tabular-shaped ore bodies total about 6 million tons grading approximately 11% zinc and just over 1% lead.⁵ The CW ore body, which will be mined first, contains about 4 million tons of ore, and the more fragmented G ore body contains about 2 million tons. Both have a typical thickness of 6 to 8 meters. By the end of 1996, the mine should be producing at full capacity, 650,000 tons of ore per year; the ore will be processed into more than 120,000 tons of concentrate with 55% zinc content, and with only a trace of cadmium and very little iron. According to Arcon officials, the Galmoy Mine will be the lowest-cost zinc producer in Europe at about 37 cents per pound of zinc in concentrate.

Production of zinc ore and concentrate in the Commonwealth of Independent States (CIS) in 1995 increased only slightly, while slab zinc output increased by 5.4%, to about 100,000 tons. This first increase in 5 years was due mainly to the 25,000-ton growth in slab production at the Cheliabinsk smelter in Russia. A further increase is expected when the modernization and expansion of the Cheliabinsk smelter is completed. It should raise the annual capacity from 150,000 tons to 220,000 tons. Kazakstan is expected to restructure its zinc industry, since the region cannot produce sufficient concentrate to feed both the Ust-Kamenogorsk and the Leninogorsk smelters. The shortage of indigenous zinc concentrates and lack of funds for imports brought the Ust-Kamenogorsk smelter to the brink of collapse and may force it to enter the international lead-zinc tolling market. By the end of 1995, it was working at one-half of its zinc-producing capacity of 240,000 tons per year.

Cia. Mineira de Metais (CMM) of Brazil reopened its idled Morro Agudo Mine in the Paracatu, Minas Gerais, region of Brazil, at which operations had been suspended in 1991 because of a depressed domestic market. This new production will augment declining output from the nearby Vazante Mine. The

additional production of 45,000 tons of zinc concentrate from the Morro Agudo Mine, together with imported zinc ore, will allow CMM to continue to produce around 100,000 tons of zinc metal per year, more than one-half of Brazil's production.

Peru's mining companies began escalating exploration, which had languished for more than 20 years. For example, Cia. Minera San Ignacio de Morococha S.A. (SIMSA), the largest privately owned zinc producer in Peru, increased its exploration budget in 1995 to about \$5 million, up from \$3.5 million in 1994. SIMSA's production in 1995 increased by about 22%, to 70,400 tons. Cia. de Minas Buenaventura, the second biggest miner, raised its 1995 exploration budget to \$8 million, from \$5 million the previous year. As a result of increased exploration activity by the Peruvian mining companies, the massive Iscaycruz zinc deposit, northeast of Lima, was discovered. The Empresa Minera Iscaycruz S.A.'s mine is to start operation in March 1996, and will add about 15% to annual zinc production in Peru. Proven reserves stand at 2.73 million tons, grading 21.4% zinc. Ore treatment capacity will be 1,000 tons per day, yielding about 62,700 tons of zinc in concentrates.⁶ Cominco Ltd. and Southwestern Gold Corp., both of Vancouver, Canada, agreed to participate in a joint development of the Accha deposit in Peru. It has estimated reserves of 5 million tons of ore grading 20% zinc and 3% lead. Only the state-owned Empresa Minera del Centro del Peru (Centromin), Peru's largest miner, is bucking the trend of increased exploration. It lacks funds even to maintain current production and is hoping to secure financial aid from foreign investors. However, very few companies have the resources needed to upgrade the seven mines and smelting and refining facilities, including the 72-year-old metallurgical installation at La Oroya, 190 kilometers east of Lima. Despite environmental and other technical problems, Centromin produced 280,759 tons of zinc in 1995.

Zinc metal demand in Turkey is projected to rise by 13% by 1999, while output from the state-owned Cinko-Kursun Metal Sanayii A.S. (Cinkur) smelter is expected to be half the 1995 production of 20,000 tons, due to declining domestic ore production. Falling ore output, owing to diminishing ore reserves, at Cinkur's Kayseri mines could be offset by the newly opened Cayeli copper-zinc mine, the annual capacity of which is expected to be 70,000 tons of zinc concentrate by 1996. However, Cinkur's smelter is configured for carbonate-based ore from its own Kayseri mines, and not the sulfide-based ore from the Cayeli Mine. Because of the proposed privatization of Cinkur, the decision about conversion of the smelter's smelting and refining process will await the new owners. Meantime, concentrate from the Cayeli Mine is being exported.

The principal zinc mines in China are in the Provinces of Gansu, Guangdong, Hunan, and Yunnan, and in the Autonomous Region of Guangxi. Low prices for zinc concentrates, about 30% of the price of the metal, caused rapid growth in zinc smelting capacity during previous years, surpassing growth in domestic concentrate supply. While zinc smelters and refineries were expanding there were no new major mining projects. Consequently, an increasing amount of feed was imported in 1995, forcing smelters either to sell metal on

the foreign spot market to pay for imports of concentrates or temporarily suspend operation. The Huludao smelter in Liaoning Province, the largest smelter in China, was forced to sell about 1,000 tons of zinc in order to cover its demand for imported zinc concentrates. Because of low concentrate supply, it was closed temporarily in 1995 and the planned production for 1996 is well below the 200,000-ton capacity. Low sales revenues also caused a month-long closure of the 115,000-ton-capacity Zhuzhou smelter, the second largest smelter in China.⁷

Because of the rising value of the yen, reduction of import duties, and a prolonged recession, the Japanese zinc industry went through a major realignment in 1995. Because the production cost, such as labor and utility charges, remained basically unchanged and the value of dollar continued to decline, it was more economical for end users to import zinc metal than buy it from domestic producers. The already inexpensive imported metal, because of the yen's high value, will become even cheaper as the import duty is gradually reduced in accordance with an agreement signed at the last World Trade Organization (formerly General Agreement on Tariffs and Trade) meeting. The prospect of declining orders of galvanized steel by the construction industry and automobile manufacturers, forced some zinc smelters to restructure and others to cease production altogether. The Nippon Mining and Metals Co. Ltd. subsidiary, Nikko Zinc Co. Ltd., suspended primary zinc smelting and refining at its Tsuruga roaster and Mikkaichi smelter. The October 1995 shutdown of the Mikkaichi smelter was preceded by a gradual output reduction from 100,000 tons in 1993 to 28,800 tons in 1995. Both plants are scheduled to become recycling plants, benefiting from tightening environmental regulations concerning the disposal of galvanized steel. After closure of its Naoshima smelter in 1994, Mitsubishi Materials Corp. followed with a decision in 1995 to close the Barajima smelter in Akita. The gradual shutdown of the 105,600-ton-capacity smelter, representing about 14% of Japan's domestic zinc production capacity, was expected to be complete by June 1996. Domestic demand will be met by increased imports and by expanded production from other smelters. For example, Toho Zinc Co. Ltd. is planning to boost annual production at the Annaka smelter to its full capacity of 139,200 tons per year from 1995 production of 120,000 tons, and Hikoshima Smelting Co. Ltd. is to exceed the capacity of its 84,000-ton-capacity smelter in Hikoshima.⁸

In June 1995, the first concentrates were shipped from the McArthur River Mine, Queensland, Australia, to smelters in the United Kingdom and Germany. The underground mine, 70% owned by M.I.M. Holdings Ltd., was expected to produce up to 1.5 million tons of ore annually by mid-1996, resulting in 350,000 tons of concentrate containing 160,000 tons of zinc. About one-half of the concentrates will be shipped to smelters in Japan, 30% owners of the McArthur River project. Proven reserves amount to 21 million tons averaging 13.9% zinc and 6.2% lead.⁹ At the end of 1995, CRA approved the development of the Century Zinc project in the Gulf of Carpentaria region of Queensland. The deposit contains indicated resources of 118 million tons of ore averaging 10.2%

zinc. The planned annual production of 450,000 tons of zinc concentrates would make it the largest zinc mine in the world. Broken Hill Pty. announced development of the Cannington polymetallic deposit in Queensland. Production was expected to start in late 1997 and average 1.5 million tons of ore. Proven reserves are 5.3 million tons grading 13.4% lead, 5.6% zinc, and 640 grams of silver per ton.

Outlook

In the United States, the domestic zinc market slowed down at the end of 1995. Because the future of the zinc market is determined by its largest use, galvanizing, the anticipated increase of automobile vehicle production should facilitate destocking of zinc semis and zinc-containing products in 1996. This could be further aided by increased use of galvanized steel in residential housing construction.

Reopenings and new mine startups are expected to increase world mine output by about 6.3% in 1996 and a further 3.8% the following year. While ore production will grow by 0.5 million tons (metal content), smelter capacity will remain essentially unchanged, rising by about 1.6% in 1996. The closure of zinc smelters in Japan will be offset by a marginal increase in production at existing smelters, planned expansion of the Onsan smelter in the Republic of Korea, and the possible return of the Datteln smelter in Germany to full capacity. The ability of the CIS and China to absorb surplus concentrates will determine whether smelter bottlenecks will develop.

In the absence of a significant increase in refining capacity, and with the expected decline of zinc exports from former Eastern Bloc countries, refined zinc demand in the industrialized countries will exceed supply in 1996 and metal inventories are expected to decline for the second consecutive year. While the anticipated drawdown of inventories may push refined zinc prices to about \$1,500 per ton, that increase may not be sufficient to significantly affect DLA sales.

¹Cominco Ltd. Annual Report 1995, p. 9.

²Savage Resources Limited. Annual Report 1995, p. 8.

³1995 Hecla Mining Annual Report, p. 6.

⁴Cambior Annual Report 1995, p. 14.

⁵Metal Bulletin. Galmoy Makes Slow Progress on Decline. Nov. 6, 1995, p. 7.

⁶Report by U.S. Embassy, Lima, Peru. July 1995.

⁷Metal Bulletin Monthly. Zinc in China—From Shortage to Surplus. Jan. 1996, p. 20.

⁸Metal Bulletin. Japan Falts as Asian Zinc-Lead Demand Grows. Aug. 31, 1995, p. 27.

⁹———. McArthur River to Aid MIM “Renaissance.” Sept. 11, 1995, p. 16.

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TABLE 1
SALIENT ZINC STATISTICS 1/

(Metric tons unless otherwise specified)

	1991	1992	1993	1994	1995
United States:					
Production:					
Domestic ores, recoverable content	518,000	523,000	488,000	570,000	614,000
Value	thousands \$602,000	\$674,000	\$497,000	\$619,000	\$756,000
Refined zinc:					
From domestic ores	218,000	227,000	214,000	201,000	223,000
From foreign ores	35,600	44,800	26,000	15,600	8,840
From scrap	122,000	128,000	141,000	139,000	131,000
Total	376,000	399,000	382,000	356,000	363,000
Secondary zinc 2/	229,000	238,000	217,000	222,000	222,000
Rolled zinc	41,800	48,200	W	W	W
Exports:					
Ores and concentrates (zinc content)	382,000	307,000	311,000	389,000	424,000
Slab zinc	1,250	565	1,410	6,310	3,080
Rolled zinc	10,400	5,430	6,600	6,680	5,180
Imports for consumption:					
Ores and concentrates (zinc content)	45,400	44,500	33,100	27,400	10,300
Slab zinc	549,000	644,000	724,000	793,000	856,000
Rolled zinc	537	171	135	475	332
Stocks of slab zinc, Dec. 31:					
Industry	80,500 r/	81,500 r/	77,000 r/	79,700 r/	70,600
Government stockpile	344,000	341,000	326,000	286,000	272,000
Consumption:					
Refined zinc:					
Reported	790,000	814,000	828,000	843,000 r/	838,000
Apparent 3/	931,000 r/	1,050,000 r/	1,120,000 r/	1,180,000 r/	1,240,000
All classes 4/	1,160,000 r/	1,290,000 r/	1,340,000 r/	1,400,000 r/	1,460,000
Price: Special High Grade, cents per pound (delivered)	52.77	58.38	46.15	49.26	55.83
World:					
Production:					
Mine	thousand metric tons 7,270	7,260	6,950 r/	7,020 r/	7,120 e/
Smelter	do. 7,310	7,230	7,400	7,370 r/	7,480 e/
Price: London, cents per pound	50.67	56.24	43.64	45.26	46.82

e/ Estimated. r/ Revised. W Withheld to avoid disclosing company proprietary data.

1/ Data are rounded to three significant digits, except prices.

2/ Excludes secondary slab and remelt zinc.

3/ Domestic production plus net imports, plus or minus stock changes.

4/ Based on apparent consumption of refined zinc plus zinc content of ores and concentrates and secondary materials.

TABLE 2
MINE PRODUCTION OF RECOVERABLE ZINC
IN THE UNITED STATES, BY STATE 1/

(Metric tons)

State	1994	1995
Alaska	W	321,000
Missouri	42,000	W
Montana	21,000	22,700
Oregon	118	--
Other	507,000	270,000
Total 2/	570,000	614,000

W Withheld to avoid disclosing company proprietary data, included with "Other."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes production from Colorado, Idaho, Illinois, New York, Tennessee, and States indicated by the symbol "W."

TABLE 3
LEADING ZINC PRODUCING MINES IN THE UNITED STATES IN 1995, IN ORDER OF OUTPUT

Rank	Mine	County and State	Operator	Source of zinc
1	Red Dog	Northwest Arctic, AK	Cominco Alaska Inc.	Zinc ore.
2	Elmwood-Gordonsville	Smith, TN	Savage Zinc Inc.	Do.
3	Pierrepont	St. Lawrence, NY	Zinc Corporation of America	Do.
4	Balmat	do.	do.	Do.
5	Young	Jefferson, TN	ASARCO Incorporated	Do.
6	Montana Tunnels	Jefferson, MT	Montana Tunnels Mining Inc.	Do.
7	Immel	Knox, TN	ASARCO Incorporated	Do.
8	Cumberland	Smith, TN	Savage Zinc Inc.	Do.
9	Leadville Unit	Lake, CO	ASARCO Incorporated	Do.
10	New Market	Jefferson, TN	do.	Do.
11	Clinch Valley	Grainger, TN	Savage Zinc Inc.	Do.
12	Casteel 1/	Iron, MO	The Doe Run Co.	Lead ore.
13	Sweetwater	Reynolds, MO	ASARCO Incorporated	Do.
14	Coy	Jefferson, TN	do.	Zinc ore.
15	Jefferson City	do.	Savage Zinc Inc.	Do.
16	West Fork	Reynolds, MO	ASARCO Incorporated	Lead-zinc ore.
17	Buick	Iron, MO	The Doe Run Co.	Do.
18	Rosiclare	Hardin and Pope, IL	Ozark-Mahoning Co.	Fluorspar.
19	Fletcher	Reynolds, MO	The Doe Run Co.	Lead ore.
20	Viburnum No. 29	Washington, MO	do.	Do.
21	Lucky Friday	Shoshone, ID	Hecla Mining Co.	Lead-zinc ore.
22	Viburnum No. 28	Iron, MO	The Doe Run Co.	Lead ore.

1/ Includes Brushy Creek Mill.

TABLE 4
REFINED ZINC PRODUCED IN THE UNITED STATES 1/

(Metric tons)

	1994	1995
Primary:		
From domestic ores	201,000	223,000
From foreign ores	15,600	8,840
Total	217,000	232,000
Secondary	139,000	131,000
Grand total (excludes zinc recovered by remelting)	356,000	363,000

1/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 5
REFINED ZINC PRODUCED IN THE UNITED STATES, BY GRADE 1/

(Metric tons)

Grade	1994	1995
Special High	119,000	117,000
High	W	W
Continuous Galvanizing	62,000	77,500
Controlled Lead	W	W
Prime Western	175,000 r/	168,000
Total	356,000	363,000

r/ Revised. W Withheld to avoid disclosing company proprietary data, included with "Prime Western."

1/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 6
SLAB ZINC CAPACITY OF PRIMARY ZINC PLANTS IN THE UNITED STATES,
BY TYPE OF PLANT AND COMPANY

(Metric tons)

Type of plant and company	Slab zinc capacity	
	1994	1995
Electrolytic:		
Big River Zinc Corp., Sauget, IL	82,000	82,000
Savage Zinc, Inc., Clarksville, TN	98,000	98,000
Electrothermic:		
Zinc Corp. of America, Monaca, PA 1/	146,000	146,000
Total operating capacity	326,000	326,000

1/ Includes secondary capacity.

TABLE 7
U.S. CONSUMPTION OF ZINC 1/

(Metric tons)

	1994	1995
Refined zinc, apparent	1,180,000 r/	1,240,000
Ores and concentrates (zinc content) 2/	2,240	1,650
Secondary (zinc content) 3/	222,000	222,000
Total	1,400,000 r/	1,460,000

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes ore used directly in galvanizing.

3/ Excludes secondary slab zinc and remelt zinc.

TABLE 8
U.S. REPORTED CONSUMPTION OF ZINC IN 1995, BY INDUSTRY USE AND GRADE 1/

(Metric tons)

Industry use	Special High Grade	High Grade	Prime Western	Remelt and other grades		Total
Galvanizing	90,000	77,900	171,000	30,500		390,000
Zinc-base alloys	194,000	--	W	W		194,000
Brass and bronze	44,800	18,800	26,000	1,970		91,500
Zinc oxide	W	W	W	--		70,900
Other	W	W	W	W		90,800
Total	435,000	98,200	251,000	54,400		838,000

W Withheld to avoid disclosing company proprietary data; included in "Total."

1/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 9
ZINC CONTAINED IN PIGMENTS AND COMPOUNDS 1/ PRODUCED
AND SHIPPED IN THE UNITED STATES 2/

(Metric tons)

	1994		1995	
	Production	Shipments	Production	Shipments
Zinc chloride	W	W	W	W
Zinc oxide	106,000	105,000	104,000	104,000
Zinc sulfate	22,700	22,000	22,300	20,000

W Withheld to avoid disclosing company proprietary data.

1/ Excludes leaded zinc oxide and lithopone.

2/ Data are rounded to three significant digits.

TABLE 10
 REPORTED DISTRIBUTION OF ZINC CONTAINED IN ZINC OXIDE
 SHIPPED, BY INDUSTRY 1/ 2/

(Metric tons)

	1994	1995
Agriculture	1,900	W
Ceramics	W	2,710
Chemicals	W	24,000
Paints	3,550	3,840
Photocopying	W	W
Rubber	65,600	68,200
Other	32,100 r/	5,330
Total	105,000	104,000

r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Other."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ In addition, zinc oxide was imported as follows, 1994--41,300 and 1995--49,000; distribution cannot be distinguished by industry.

TABLE 11
 U.S. EXPORTS OF ZINC ORES AND CONCENTRATES, BY COUNTRY 1/

	1994		1995	
	Quantity (metric tons, zinc content)	Value (thousands)	Quantity (metric tons, zinc content)	Value (thousands)
Belgium	86,700	\$36,100	55,000	\$27,300
Canada	147,000	67,600	176,000	89,200
China	37	5	9,240	4,420
Germany	30,200	12,600	30,200	14,400
Japan	68,400	24,500	68,000	29,600
Korea, Republic of	11,700	4,850	22,300	10,700
Latvia	20,300	4,460	--	--
Netherlands	9	8	25,400	12,300
Russia	9,990	2,200	6,870	2,300
Spain	9,660	2,210	15,400	3,330
Thailand	--	--	9,240	4,420
Other	5,690	2,080	6,320	2,940
Total	389,000	157,000	424,000	201,000

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: Bureau of the Census.

TABLE 12
U.S. EXPORTS OF ZINC COMPOUNDS 1/

	1994		1995	
	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)
Lithopone	426	\$393	342	\$570
Zinc chloride	947	939	1,690	1,250
Zinc compounds, n.s.p.f.	8,530	13,300	1,690	4,350
Zinc oxide	8,200	7,190	7,090	9,110
Zinc sulfate	5,230	8,500	4,210	2,260
Zinc sulfide	2,000	792	377	498

1/ Data are rounded to three significant digits.

Source: Bureau of the Census.

TABLE 13
U.S. IMPORTS FOR CONSUMPTION OF ZINC COMPOUNDS 1/

	1994		1995	
	Quantity (metric tons, gross weight)	Value (thousands)	Quantity (metric tons, gross weight)	Value (thousands)
Lithopone	1,110	\$857	1,450	\$1,560
Zinc chloride	3,360	2,960	2,450	2,370
Zinc compounds, n.s.p.f.	225	519	136	314
Zinc oxide	41,300	45,800	49,100	54,200
Zinc sulfate	7,200	4,000	5,400	3,820
Zinc sulfide	1,950	5,530	--	--

1/ Data are rounded to three significant digits.

Source: Bureau of the Census.

TABLE 14
ZINC: WORLD MINE PRODUCTION (CONTENT OF CONCENTRATE AND DIRECT SHIPPING ORE UNLESS NOTED), BY COUNTRY 1/ 2/

(Metric tons)

Country	1991	1992	1993	1994	1995 e/
Algeria	2,610	4,044 r/	3,672 r/	3,050 r/	3,000
Argentina	39,253	40,978	31,395	33,000 e/	33,000
Australia	1,024,000	1,025,000	1,010,000	995,000	930,000 3/
Austria	14,827	15,787 r/	20,014 r/	-- e/	--
Bolivia	129,778	143,936	122,638	100,742 r/	146,131 3/
Bosnia and Herzegovina e/	XX	2,000 r/	350 r/	300 r/	300
Brazil	130,000	149,000	171,800	145,900 r/	146,000
Bulgaria	29,100	29,000 e/	32,000 r/	30,000 r/	30,000 3/
Burma	996	1,078	850	1,316 r/	719 3/
Canada	1,156,582	1,324,675	1,007,257	984,000	1,111,497 3/
Chile	30,998	29,730	29,435	31,038 r/	30,000
China e/	750,000	758,000	775,000	990,000 r/	950,000
Colombia	266	277	279	275	275
Czech Republic	XX	XX	1,500 e/	100	-- 3/
Czechoslovakia e/ 4/	11,600	7,500	XX	XX	XX
Ecuador e/	100	100	100	100	100
Finland	57,310 r/	32,817 r/	22,529 r/	3,734 r/	3,500
France	27,109	16,539	13,834	1,000 e/	--
Georgia e/	XX	2,000	1,500	1,000	700
Germany	53,987	14,288	--	-- e/	--
Greece	30,000	26,000	22,000	33,216 r/	25,000
Honduras	38,280	29,008	18,256	16,697	14,500
India	104,500	152,800	156,300	147,300 r/	157,300 3/
Iran	70,000 e/	66,000	77,000	75,000 e/	75,000
Ireland	187,500	194,100	193,700	195,000 e/	182,000
Italy	36,349	35,032	7,100	22,900 r/	20,000
Japan	133,004	134,510	118,599	100,653	95,274 3/
Kazakstan e/	XX	250,000	250,000	190,000 r/	190,000 3/
Korea, North e/	200,000	200,000	210,000	210,000	210,000
Korea, Republic of	22,039	21,883	13,808 r/	7,122 r/	7,000
Macedonia e/	XX	16,000	16,000	16,000	16,000
Mexico	317,101	294,408	369,697	381,689 r/	363,658 3/
Morocco	24,331	22,604	62,874 r/	74,693 r/	75,000
Namibia	33,150	36,053	28,380	33,414 r/	30,209 3/
Norway	18,886	21,058	14,327	15,586	16,000
Peru	638,064	604,525	664,045	690,017 r/	688,619 3/
Poland	144,700	151,700	150,900 r/	150,000 r/	150,000
Romania	26,322 r/	25,813 r/	28,017 r/	35,357 r/	34,730 3/
Russia e/	XX	150,000	170,000	137,000 r/	166,000
Saudi Arabia e/	2,475 3/	2,480	2,500	2,000 r/	2,000
Serbia and Montenegro e/	XX	19,700	9,700	7,770 r/	8,000
Slovakia e/	XX	XX	1,000 r/	1,000 r/	1,000
Slovenia	XX	1,550	--	-- e/	-- 3/
South Africa	64,425	71,928	77,096	76,361	70,241 3/
Spain	261,000 e/	204,655	170,200	150,425	170,000
Sweden	161,170	171,539	168,617	159,858	160,000
Thailand e/	87,000 3/	62,000	70,000	56,000	20,000
Tunisia	5,310 r/	4,090	2,400	26,500	25,000
Turkey 5/	32,546	32,514	32,500 e/	34,000 r/	67,000 3/
U.S.S.R. 6/	475,000 e/	XX	XX	XX	XX
United Kingdom	1,078	--	--	-- e/	--
United States	547,000	552,000	513,000	598,000	644,000 3/
Uzbekistan e/	XX	60,000	50,000 r/	35,000 r/	35,000
Vietnam e/	15,000	15,000	15,000	15,000	15,000
Yugoslavia 7/	75,000 e/	XX	XX	XX	XX
Zaire	42,400	22,300	6,500 e/	6,500 e/	1,000
Zambia 8/	19,825	14,706	16,704	--	-- 3/
Total	7,270,000	7,260,000	6,950,000 r/	7,020,000 r/	7,120,000

See footnotes at end of table.

TABLE 14--Continued

ZINC: WORLD MINE PRODUCTION (CONTENT OF CONCENTRATE AND DIRECT SHIPPING ORE UNLESS NOTED), BY COUNTRY 1/ 2/

e/ Estimated. r/ Revised. XX Not applicable.

1/ World totals, U.S. data, and estimated data are rounded to three significant digits; may not add to totals shown.

2/ Table includes data available through Aug. 1, 1996.

3/ Reported figure.

4/ Dissolved Dec. 31, 1992.

5/ Content in ore hoisted.

6/ Dissolved in Dec. 1991.

7/ Dissolved in Apr. 1992.

8/ Data are for years beginning Apr. 1 of that stated. Content of ore milled. Mine closed June 1994.

TABLE 15
ZINC: WORLD SMELTER PRODUCTION, BY COUNTRY 1/ 2/

(Metric tons)

Country	1991	1992	1993	1994	1995 e/
Algeria, primary	24,900	25,000 r/	29,000 r/	24,000 r/	24,000
Argentina:					
Primary	35,800	34,500	35,000 e/	34,500 e/	34,500
Secondary e/	2,800	2,800	2,800	2,700	2,800
Total	38,600	37,300	37,800 e/	37,200 e/	37,300
Australia:					
Primary 3/	322,000	333,000	316,000	323,000 r/	332,000 4/
Secondary e/	4,500	4,500	4,500	4,500	4,500
Total e/	327,000	338,000	321,000	328,000 r/	337,000
Austria, primary and secondary	15,890	5,537	6,838 r/	--	--
Belgium, primary and secondary	384,200 r/	310,600	299,600	306,200 r/	300,000
Brazil:					
Primary	157,462	180,414	187,550	187,300 r/	187,000
Secondary	5,538	7,000	7,200	7,000	7,000
Total	163,000	187,414	194,750	194,300 r/	194,000
Bulgaria, primary and secondary	58,730	57,820 r/	54,039 r/	64,000 r/	65,000
Canada, primary	660,552 r/	671,702 r/	659,881 r/	690,965 r/	720,145 4/
China, primary and secondary e/	612,000	719,000	857,000	1,010,000 r/	1,050,000
Czechoslovakia, secondary 5/ 6/	800	1,100	XX	XX	XX
Finland, primary	170,389	170,523	170,934	173,000 e/	170,000
France, primary and secondary e/	299,600 4/	319,000	310,000	310,000	306,000
Germany, primary and secondary	345,712	383,117	380,948	359,878	360,000
Hungary, secondary e/	1,300	1,000	1,000	-- r/	--
India:					
Primary	83,600 r/	128,100	141,700	156,400 r/	146,500 4/
Secondary e/	200	200	200	500	500
Total e/	83,800 r/	128,000	142,000	157,000 r/	147,000
Italy, primary and secondary	263,775	252,600	254,000 e/	242,000 r/	250,000
Japan:					
Primary	640,600	645,000	609,300	571,900	573,900 4/
Secondary	138,100	135,600	135,200	141,400	143,000 4/
Total	778,700	780,600	744,500	713,300	716,900 4/
Kazakstan, primary e/	XX	260,000 r/	260,000 r/	200,000 r/	200,000
Korea, North, primary e/	175,000	175,000	200,000	200,000	200,000
Korea, Republic of, primary	254,100	253,000	272,000 e/	250,000 e/	250,000
Macedonia, primary and secondary e/	XX	30,000 r/	30,000 r/	30,000 r/	30,000
Mexico, primary	189,100	151,600	209,900	209,200 r/	222,748 4/
Netherlands, primary 7/	211,082	218,410 r/	206,700	212,600 r/	210,000
Norway, primary	124,916	127,564	129,192	131,921	130,000
Peru, primary	154,600	138,200	165,400	165,000	165,000
Poland, primary and secondary	126,000	134,600	149,000 r/	158,000 r/	155,000
Portugal, primary e/	2,100	2,200	2,800	3,000	3,000
Romania, primary and secondary	8,740	11,600	14,100	18,500	18,000
Russia: e/					
Primary	XX	140,000	140,000	100,000 r/	121,000
Secondary	XX	60,000	60,000	50,000	50,000
Total	XX	200,000	200,000	150,000 r/	171,000

See footnotes at end of table.

TABLE 15--Continued
ZINC: WORLD SMELTER PRODUCTION, BY COUNTRY 1/ 2/

(Metric tons)

Country	1991	1992	1993	1994	1995 e/
Serbia and Montenegro, primary and secondary	XX	14,182	6,985 r/	3,895 7/	5,500
Slovakia, secondary e/ 5/	XX	XX	1,000	1,000	1,000
Slovenia, primary and secondary e/	XX	2,500	2,500	2,500	2,500
South Africa, primary	91,700	83,200	96,154	93,850	98,782 4/
Spain, primary and secondary	262,200	351,900 r/	327,600	300,600 r/	325,000
Thailand, primary	62,152	60,557	65,000 e/	58,513 r/	46,398 4/
Turkey, primary	17,370	18,770	18,500 r/	18,567 r/	20,000
Ukraine, secondary e/	XX	15,000	15,000 r/	15,000 r/	5,000
U.S.S.R.: e/ 8/					
Primary	700,000	XX	XX	XX	XX
Secondary	100,000	XX	XX	XX	XX
Total	800,000	XX	XX	XX	XX
United Kingdom, primary and secondary	100,651	96,813	102,391	101,300 r/	100,000
United States:					
Primary	253,000	272,000	240,000	217,000	232,000 4/
Secondary	123,000	128,000	142,000	139,000	131,000 4/
Total	376,000	399,000 r/	382,000	356,000	363,000 4/
Uzbekistan, primary e/	XX	65,000	65,000	70,000 r/	70,000
Vietnam, primary and secondary e/	10,000	10,000	10,000	10,000	10,000
Yugoslavia, primary and secondary 9/	78,000	XX	XX	XX	XX
Zaire, primary	28,300	18,800	6,000 r/ e.	1,000 r/ e.	--
Zambia, primary 10/	6,339	7,288	3,446	--	--
Grand total	7,310,000	7,230,000	7,400,000	7,370,000 r/	7,480,000
Of which:					
Primary	4,370,000	4,180,000 r/	4,230,000 r/	4,090,000 r/	4,160,000
Secondary	376,000	355,000	368,000 r/	361,000 r/	345,000
Undifferentiated	2,570,000	2,700,000	2,800,000 r/	2,920,000 r/	2,980,000

e/ Estimated. r/ Revised. XX Not applicable.

1/ World totals, U.S. data, and estimated data are rounded to three significant digits; may not add to totals shown.

2/ Wherever possible, detailed information on raw material source of output (primary--directly from ores, and secondary--from scrap) has been provided. In cases where raw material source is unreported and insufficient data are available to estimate the distribution of the total, that total has been left undifferentiated (primary and secondary). To the extent possible, this table reflects metal production at the first measurable stage of metal output. Table includes data available through Aug. 1, 1996.

3/ Excludes zinc dust.

4/ Reported figure.

5/ All production in Czechoslovakia in 1991-92 came from Slovakia.

6/ Dissolved Dec. 31, 1992.

7/ Sales.

8/ Dissolved in Dec. 1991.

9/ Dissolved in Apr. 1992.

10/ Data are for years beginning Apr. 1 of that stated. Imperial smelter production ceased in Mar. 1993. Electrolytic production was suspended Jan. 1991 to Mar. 1993 and ceased in Jan. 1994.