THE LEAD-ZINC INDUSTRY OF THE UNITED STATES, CANADA AND MEXICO

Compiled by Arizona Department of Mineral Resources From U.S.Tariff Commission's Report to Congress, April 1954.

L E A D

Mine Production - in short tons of lead content.

	1949	1950	1951	1952	1953
United States	410,000	431,000	388,000	390,000	335,000
Canada	160,000	166,000	158,000	165,000	196,000
Mexico	243,000	262,000	249,000	271,000	244,000

Consumption of Primary Metals - in short tons.

	1949	1950	1951	1952
United States	579,000	885,100	677,700	781,900
Canada	51,300	57,300	62,800	55,500
Mexico	9,000	10,600	9,900	10,900

	Proportion of U.S.Imports for Consumption (1948-53) percent	U. S. Imports for Consumption as Proportion of Mine Output of Supplying Countries (1948-52) percent
Mexico	33	60
Canada	20	56

MEXICO'S LEAD INDUSTRY

Virtually all of the crude ore mined in Mexico is smelted in that country, chiefly by American-owned companies. In the period 1946-52, Mexico accounted for about 14 percent of the total world mine and primary smelter output of lead; in both of these categories, it ranks second only to the United States as a world producer.

Consumption of lead in Mexico averaged about 10,000 tons per year during 1946-52, and was equivalent to only 4 percent of Mexico's mine output, leaving a large annual surplus available for export. The United States has been the principal foreign outlet, and the United Kingdom and Belgium are the other major foreign markets. U. S. imports from Mexico increased from 120,000 tons in 1948 to about 230,000 tons in 1950 but declined sharply to 50,000 tons in 1951, when Mexico diverted lead shipments to European markets, where higher prices were obtainable with Marshall Plan money, though the United States itself was scratching around for all the lead she could get. The ceiling price in 1951 was 17.0 cts. until Oct. 2nd, when it was raised to 19 cts. However, foreign lead was not

under control, and bidding for foreign consumers jumped the price of foreign lead to several cents above the domestic price. Therefore more and more foreign lead was drawn away from the American market. In 1952 imports from Mexico increased to 210,000 tons, and in 1953 they amounted to 138,000 tons.

CANADA'S LEAD INDUSTRY

In both the prewar and postwar periods, Canada accounted for approximately 10 percent of the total world output of lead and ranked fourth as a world producer after the United States, Mexico and Australia.

Primary smelter production of lead in Canada has averaged about 160,000 tons per year in 1946-52, and was equivalent to 95 percent of Canadian mine output of lead. Consumption of lead in Canada was at a fairly stable rate of about 60,000 tons per year during 1946-52, and was equivalent to about 35 percent of Canada's average postwar mine output. The quantity of lead available for export from Canada consists of lead from domestic ores and lead obtained from concentrates imported from South America and the United States. From 1948 to 1952, United States imports of unmanufactured lead from Canada averaged approximately 90,000 tons yearly and were equal to 56 percent of Canada's lead mine out-put in these years. In 1953, imports of lead from Canada amounted to 62,000 tons, compared with imports of 120,000 tons in 1952. From 1948 through 1953, Canada supplied 20 percent of total United States imports of unmanufactured lead from all sources.

Z I N C

Mine Production - in short tons of zinc content.

	1949	1950	1951	1952	1953
United States	593,000	623,000	681,000	666,000	535,000
Canada	288,000	313,000	341,000	367,000	400,000
Mexico	197,000	246,000	198,000	251,000	220,000

Consumption of Primary Metals - in short tons.

	1949	1950	1951	1952
United States	711,800	967,100	934,000	849,300
Canada	41,600	54,400	61,000	51,700
Mexico	7,700	10,500	17,900	9,900

	Proportion of U.S. Imports for Consumption (1948-53) percent	U. S. Imports for Consumption as Proportion of Mine Output of Supplying Countries (1948-52) percent
Mexico	42	55
Canada	36	74

MEXICO'S ZINC INDUSTRY

During 1946-1952, Mexico's mine output of zinc was nearly 210,000 tons a year, or approximately 35 percent higher than the average 1937-39 level of 170,000 tons.

Primary smelter production of zinc in Mexico has averaged 60,000 tons per year since 1946, or about 30 percent of Mexico's postwar mine output. Thus, most of Mexico's zinc ores and concentrates are exported. Mexico's zinc consumption has averaged 10,000 tons annually since 1946, equivalent to 4 percent of mine output.

The United States is the principal market for Mexico's zinc exports. Imports of unmanufactured zinc into the U. S. from Mexico averaged 160,000 tons per year in 1948-52, or nearly 75 percent of Mexico's mine production. Imports have increased from 115,000 tons in 1948 to nearly 300,000 tons in 1952, or nearly 160 percent during the 5-year period. Mexico accounted for 36 percent of total U. S. imports of unmanufactured zinc from all sources during the period 1948 through 1953.

CANADA'S ZINC INDUSTRY

Canada's mine and primary smelter output of zinc have both increased steadily during the postwar period. Mine production rose from about 250,000 tons in 1947 to an annual rate of approximately 400,000 tons during the first 10 months of 1953. Primary smelter production was at an annual average rate of 200,000 tons during 1946-52, or about 66 percent of Canada's postwar mine production.

Consumption of zinc in Canada was at a relatively stable rate of 50,000 tons per year during 1946-52, equivalent to about 17 percent of Canada's mine output.

The quantity of zinc available for export from Canada consists of zinc from domestic ores and zinc obtained from concentrates imported from South America and the United States. From 1948-1952 Canadian total exports of unmanufactured zinc were at an annual rate of nearly 290,000 tons. United States imports of unmanufactured zinc from Canada increased from 120,000 tons in 1948 to 250,000 tons in 1952. In 1953 imports of unmanufactured zinc from Canada were 280,000 tons. In the 5-year period 1948-52, United States imports from Canada averaged 175,000 tons per year and were equivalent to about 55 percent of Canada's mine production of zinc. During the 6-year period (1948-53), Canada accounted for 42 percent of total U. S. imports of unmanufactured zinc from all sources.

The same abnormal condition existed in zinc in 1951 as in lead. A"free market" outside of the United States in 1951 responded to the law of supply and demand, in which metals sold as high as 30¢ - 40¢ per lb. as compared to a U. S. controlled price of 17.5¢ which prevailed for the first nine months. The inevitable result of this disparity was the diversion of metal and concentrate imports, on which we are dependent for about one-third of our supplies, to the higher world markets.

GRADE OF LEAD-ZINC ORES IN UNITED STATES, CANADA AND MEXICO

The gross metal content of the ores mined in 1952 in the United States, which includes metal lost in milling and smelting the ores, was 1.7 percent lead, 3.2 percent zinc, 0.1 percent copper, and 0.91 ounces of silver and 0.007 ounces of gold per ton. Of the total metal contained in the ores mined in 1952, about 87 percent of the lead and 79 percent of the zinc was recoverable. The recoverable grade of ore mined in the United States varied widely among the mining states or districts, both with regard to the kinds and relative amounts of the metals contained. The following table gives the distribution of the tons ore mined and the recoverable metal content in various parts of the United States:

	Crude Ore Mined 1,000 Short Tons	Recoverable Metal Content				
		Lead %	Zinc %	Silver oz/ton	Gold oz/ton	Copper %
United States	25,086	1.4	2.5	0.73	.006	0.1
Western States	8,834	2.4	4.1	2.02	.016	0.2
S.E.Missouri	6,149	1.8	Less than.3	0.08	-	Less than 0.05
Tri-State	6,140	0.4	1.4	-	-	-
East of Miss.R.	3,963	0.2	4.5	0.01	-	-

Compare the average grade of lead-zinc ores, mined in the United States, in the following table, with the average grade of ore reserves in Canada and Mexico:

	Lead content percent	Zinc content percent	Copper content percent	Silver content oz/ton	Gold content oz/ton	Gross Value Per Ton with Pb = 14 cts. Zn = 11cts.Cu=25cts.Gold= $35/oz Silver = 85 cts/oz.
United States	1.7	3.2	0.1	0.91	0.007	$13.25
Canada	3.9	5.6	1.0	2.11	0.033	$31.18
Mexico	6-7	7-10	-	9-12	-	$45.40

Mexico, with three times as much lead-zinc in its ores as there is in U. S. ore, and Canada, with twice as much lead-zinc as the United States, have a considerable edge over the United States in ultimate production costs, regardless of the cost of labor, supplies and taxes. In addition, Canada has over four times as much gold, over twice the silver, and ten times as much copper, in by-products; and Mexico has ten times as much silver in by-products, as the United States.

Assuming 87% lead recovery and 79% zinc recovery: in the case of Mexico's 6.5% lead and 8.5% zinc, they recover 5.65% lead and 7.15% zinc; Canada's 3.9% lead and 5.6% zinc, they recover 3.4% lead and 4.4% zinc; as compared with U. S. recovery of 1.4% lead and 2.5% zinc.

Mexico's recovery of	113 lbs. lead @ 14 cts/lb. =	$15.82 per ton ore
" " "	143 lbs. zinc @ 11 cts/lb. =	$15.73 per ton ore
	Total Recovery =	$31.55 per ton ore

Canada's recovery of	68 lbs. lead @ 14 cts/lb. =	$ 9.52 per ton ore
" " "	88 lbs. zinc @ 11 cts/lb. =	$ 9.68 per ton ore
	Total Recovery =	$19.20 per ton ore

U. S.'s recovery of	28 lbs. - lead @ 14 cts/lb. =	$ 3.92 per ton ore
" " "	50 lbs. - zinc @ 11 cts/lb. =	$ 5.50 per ton ore
	Total Recovery =	$ 9.42 per ton ore

The net recovery of Mexico of $31.55 minus the U. S. recovery of $9.42 leaves $22.13, or 8.64 cts. per lb. of lead-zinc to take care of U. S. import duties and higher supply costs and taxes?

The net recovery of Canada of $19.20 minus the U. S. recovery of $9.42 leaves $9.78, or 6.27 cts. per lb. of lead-zinc to take care of U. S. import duties.

FINANCIAL ASPECTS OF LEAD-ZINC INDUSTRY IN UNITED STATES, CANADA AND MEXICO.

Important Canadian and Mexican producers of lead and zinc supplied the Tariff Commission financial and operating data on the same questionnaire forms that were used in canvassing domestic mining and milling companies. However, the individual replies were confidential, and the information had to be generalized by the Commission. Reports received for Canada covered 4 mines and 3 mills that in 1952 accounted for 80 percent and 61 percent, respectively, of total Canadian mine production of lead and zinc. Reports received for Mexico covered 15 mines and 12 mills that in 1952 accounted for 28 percent and 45 percent respectively, of Mexico's mine production of lead and zinc.

L A B O R

A comparative analysis of the data reported for the three countries indicates that average labor costs per ton of ore mined and milled are highest in Canada and lowest in the United States. The value of products obtained from crude ores mined in Canada and Mexico, however, is very much greater than in the U. S., owing both to the higher recoverable content of lead and zinc and to the higher recoverable content of gold, silver and copper. Hence, despite higher average labor costs per ton of crude ore mined in those two countries, their average labor cost per dollar's worth of mine or mill product is less than in the United States.

Average hourly earnings reported for workers at Canadian mines and mills were only slightly less than the U. S. average. Average hourly earnings for Mexican workers were very much less than average hourly earnings either in the United States or Canada.

The ratio of net operating profit before income taxes to net sales was much higher for the reporting Canadian producers than for U. S. producers for all years covered by the survey (1950, 1952, Jan. - June, 1953). This ratio for reporting Mexican producers was much higher than U. S. producers for 1950; for 1952 the ratios were nearly the same, and for the first half of 1953 the ratio was substantially lower for the reporting Mexican concerns than for United States producers.

T A X E S

An outstanding difference between the cost of lead and zinc mining and milling in the U. S. and Canada on the one hand, and in Mexico on the other, is in the element of taxes other than income taxes. Such taxes per ton of crude ore mined in Mexico, as reported to the Tariff Commission, were much higher than in Canada and very much higher than in the United States.

The principal taxes on Mexican mining operations are: (1) The special export surtax imposed in addition to the regular export duties, and (2) the Mexican production tax, a progressive tax based on the value of metals produced. Both taxes are levied in addition to Mexican national income taxes on corporate earnings, and State or Municipal taxes. The total export tax applicable to lead ore is 22.44 percent ad valorem, or 17.2 percent, depending on the distance of the mine from Mexican mills or smelters. The corresponding rates for zinc ores are 22.4 percent ad valorem and 15.3 percent. Exported lead concentrates are dutiable at 17.2 percent ad valorem, and zinc concentrates, at 18.1 percent.

Mexican production taxes are a severance tax imposed by the Government for the purpose of recovering a portion of the value of minerals exploited by private producers. In effect, the tax consists of three parts: (1) A basic advalorem rate applied to the official valuation of the metal as determined monthly by the Ministry of Finance on the basis of New York Market quotations, (2) an additional ad valorem tax based on the excess of the current prices of lead and zinc over fixed minimum prices, and (3) an additional tax equal to 10 percent of the first two taxes combined.

For lead ores the basic production tax rate is 3.7 percent ad valorem, and for lead concentrates, 2.3 percent ad valorem. An additional tax of 0.6 percent is payable for each 0.03 peso that the peso equivalent of the New York price exceeds 0.17 peso per pound. Finally, 10 percent additional is added to the two taxes above mentioned.

For zinc ore the basic production tax is 2.4 percent ad valorem, and for zinc concentrates it is 1.4 percent. An additional tax of 0.3 percent is levied for each 0.03 peso that the peso equivalent of the New York price exceeds 0.19 peso per pound. A further tax of 10 percent is added to the two foregoing taxes. For tax purposes, although the official rate of exchange is 8.65 pesos per U. S. dollar, the rate of 4.85 pesos is used by the Mexican Government for calculating these taxes.

Mexican income taxes range from 3.8 percent on annual taxable profits of 2,000 pesos to a maximum of 30 percent on taxable profits in excess of 500,000 pesos. An additional tax of 10 percent is applicable to profits distributable as dividends. An excess-profits tax, ranging from 5 percent to 25 percent, is payable on profits exceeding 15 percent of the working capital. For foreign companies working capital is defined as 60 percent of total assets.

TRANSPORTATION COSTS

Although there are wide variations in transportation costs of lead-zinc ores and concentrates to the smelters and for smelter products to refineries, and for refined products to the manufacturers, on the whole there does not seem to be any appreciable difference in such costs affecting the ultimate cost of lead or zinc production, whether the metal comes from the United States, Canada or Mexico.

RATES OF DUTY

	Under Trade Agreements				Max. rate possible as result of "escape clause" action.	
	Rate in effect on Jan. 1, 1954			Rate of duty existing on Jan.1, 1945 *		
LEAD	Rate of Duty Under Tariff Act of 1930	Specific Rate	Reduction from 1930 Rate Percent		Specific Rate **	Increase over rate in effect on Jan.1, 1954
Lead-bearing ores & Mattes.	1-1/2¢/lb.	3/4¢/lb.	50	1.2¢/lb.	1.8¢/lb.	140
Lead Bullion, Pigs or Bars.	2-1/8¢/lb.	1-1/16¢/lb.	50	1.7¢/lb.	2.55¢/lb.	140
Lead Sheets, Pipe.	2-3/8¢/lb.	1-5/16¢/lb.	50	2-3/8¢/lb.	3-9/16¢/lb.	171
ZINC						
Zinc-bearing Ores	1-1/2¢/lb.	.6¢/lb.	60	1.2¢/lb.	1.8¢/lb.	200
Zinc-Blocks, Pigs or Slabs.	1-3/4¢/lb.	.7¢/lb.	60	1.4¢/lb.	2.1¢/lb.	200
Zinc Sheets.	2¢/lb.	1¢/lb.	50	2¢/lb.	3¢/lb.	200

* The rate "existing on Jan. 1, 1945" for the purpose of Section 350 (a), Tariff Act of 1930, as amended (for determining the maximum rate possible as a result of "escape clause" action) is not necessarily the actual rate assessed on that date.

** Rate "existing on Jan. 1, 1945" plus 50 percent of that rate.

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October, 1954