

MINE PRODUCTION OF GOLD, SILVER, COPPER, LEAD, AND ZINC IN ARIZONA IN 1951.

BY CLASS OF ORE OR OTHER SOURCE MATERIAL, WITH CONTENT IN TERMS OF RECOVERABLE METAL.

Source: U. S. Bureau of Mines - Annual Area Report D-12 Final Figures

Source	Number of Mines <u>1/</u>	Material sold or treated (short tons)	Gold (fine ounces)	Silver (fine ounces)	Copper tons	Lead tons	Zinc tons
ORE:							
Dry gold	31	3,418	1,085	3,296	12	1	1
Dry gold-silver	4	186	68	2,064	1	1	-
Dry silver	27	27,567	780	242,850	19	9	-
Total ...	62	31,171	1,933	248,210	32	11	1
Copper	89	42,784,388	83,521	3,087,865	387,805	1	-
Lead	73	5,809	297	20,839	11	802	37
Lead-copper	2	2	--	9	--	1	-
Zinc	9	8,859	15	5,705	37	18	1,195
Zinc-copper	11	433,256	7,507	602,083	9,397	483	22,385
Zinc-lead	40	503,300	22,182	1,143,196	1,269	15,985	29,179
Zinc-lead-copper	4	2,643	--	6,640	69	72	199
Total ...	228	43,738,257	113,522	4,866,337	398,588	17,362	52,995
Other "lode" material:							
Old tailings, etc. <u>2/</u> ..	10	50,925	482	6,427	164	21	3
Copper precipitates ...	6	--	--	--	17,086	-	-
Total "lode" material ...	265	43,820,353	115,937	5,120,974	415,870	17,394	52,999
Gravel (placer operations)	18	--	156	11	--	--	--
1951 Total, all sources	283	43,820,353	116,093	5,120,985	415,870	17,394	52,999
1950 Total, all sources	333	42,709,272	118,313	5,325,441	403,301	26,383	60,480
1949 Total, all sources	372	38,372,879	108,993	4,970,736	359,010	33,568	70,658

1/ Detail will not necessarily add to totals because some mines produce more than one class of ore.

2/ Old tailings: Gold, 56 tons; gold-silver, 43,980 tons; copper, 6,682 tons; lead, 2 tons.

Smelter cleanings: Copper, 41 tons; lead, 152 tons.

Mill cleanings: Gold, 12 tons.

NOTES ON GOLD, SILVER, COPPER, LEAD AND ZINC MINING

IN ARIZONA IN 1951

Arizona's output of copper (415,870 short tons) was the largest in the State's history, despite labor strikes for brief periods in 1951.

Lead and Zinc output declined in 1951, due chiefly to the decline in output from the Copper Queen Mine at Bisbee, where zinc-lead ore reserves are nearly depleted.

Outstanding features of Arizona's mining activities in 1951 were the record production of copper ore, especially from open pits; the record output of zinc-copper ore from the Cochise (Dragoon), Pioneer (Superior), and Verde (Jerome) districts; the record production of copper in the Mineral Creek (Ray) district; and the record production of zinc in the Verde (Jerome) district.

Arizona's producing mines declined from 333 (including 24 placers) in 1950 to 283 (including 18 placers) in 1951.

The value of metal production was as follows:

831,740,000 lbs. Copper @ 24.2 cts.	\$ 201,281,080
34,788,000 lbs. Lead @ 17.3 cts.	6,018,324
105,998,000 lbs. Zinc @ 18.2 cts.	19,291,636
116,093 oz. Gold @ \$35.00	4,063,255
5,120,985 oz. Silver @ \$.905 plus	4,634,750
Total	\$ 235,289,045

Copper milling ore averaged 1.042 percent copper and carried minor quantities of gold and silver per ton of ore. Zinc-lead ore averaged .06 oz. of gold and 2.72 oz. of silver to the ton, .38 percent copper, 3.58 percent lead, and 7.53 percent zinc. Zinc-copper ore averaged .04 oz. of gold and 200 ozs. of silver to the ton, 2.57 percent copper, .40 percent lead, and 7.49 percent zinc.

The straight copper mines produced 97.40% of the total copper, 72.36% of the total gold, and 60.42% of the total silver, produced in Arizona. The gold, gold-silver and silver mines produced 1.80% of the total gold and 4.85% of the total silver produced in Arizona.

The lead, zinc, lead-zinc, zinc-copper, and zinc-lead-copper mines produced 99.81% of the total lead, 99.99% of the total zinc, 2.59% of the total copper, 25.85% of the total gold, and 34.73% of the total silver produced in Arizona.

Arizona Department of Mineral Resources

August, 1952

THE VALUE OF ARIZONA'S COPPER, LEAD, ZINC, GOLD AND SILVER

AS THEY LEAVE THE STATE.

In its statistical work, the Arizona Department of Mineral Resources has been publishing production figures for Arizona based on the U. S. Bureau of Mines reports. These reports cover the value of the metals produced after they have been transported East and refined and marketed (in the case of copper), and smelted, refined and marketed (in the case of lead and zinc, there being no lead and zinc smelters in Arizona).

The true value of these metals as they leave the state may therefore be said to be their market price less the cost of freight, processing and marketing. However, the true worth of the copper, lead and zinc produced in the state, for comparative purposes with other State products, should be based on the U. S. market-price, which is the standard measure of value. For example, if we want to compare the value of copper produced in Arizona with the value of livestock or cotton, we would use the average U. S. Market-prices of these products, multiplied by the total weight of the product.

At first glance, it would seem that if it is desired to learn the value of the metal as it leaves the state, the production tax which is applied against the metals (except gold and silver) as they enter interstate commerce, would serve the purpose, but the calendar cut-off differs from the actual production reported annually by the metal producers. There might be a considerable discrepancy in any one year.

A study has been made by this Department to determine the value of Arizona's metal production as it leaves the State. The five-year period, 1947-1951 inclusive, was used to indicate the relation this value bore to the total value reported by the U. S. Bureau of Mines.

In the case of copper, it was found that the freight, refining and marketing costs on 3-3/4 billion pounds of copper produced in seven years (1945-1951) was \$0.02056 cts. per lb. A figure of 2 cents per pound was accordingly used. For example, in 1951 the U. S. Market-price for copper was 24.2 cts. Therefore, the value of the copper as it left the State was 22.2 cts. per pound, and this price was applied to the total poundage of copper shipped out of the State. The five-year production of copper at this stage of its processing was found to be worth 90.72% of the value as reported by the Bureau of Mines.

In the case of lead and zinc, it was found that the value of the total lead and zinc production of the three big producers (Eagle Picher, Iron King and Mammoth St. Anthony) averaged 54.92% of that reported by the Bureau of Mines for the five-year period. This figure of 54.92% was therefore applied against the value of all lead and zinc produced in Arizona during this period and evaluated by the Bureau of Mines.

As all charges for the smelting and refining of copper are made against the base metal, the gold and silver by-products are paid for at the full government market price. This is not exactly the case with lead and zinc, where approximately 92% of the silver content is paid for by the smelter. This amounts to so small a proportion of the gold and silver produced in Arizona that it is disregarded in calculating the value of gold and silver in compiling this report.

The net value of all five metals (Copper, Lead, Zinc, Gold and Silver) as they left the State was 86.62% of the value as reported by the Bureau of Mines, for the five-year period (1947-1951 inclusive).

The tables on the next page show the details of all of the above calculations:

C O P P E R

Year	Lbs. Copper Produced	U. S. Market Price	Value	Price before Frt., Refg. & Marketing	Value	% of Bureau of Mines Valuation
1947	732,436,000	21.0 cts.	\$ 153,811,560	19.0 cts.	\$ 139,168,699	90.48
1948	750,242,000	21.7 cts.	162,802,514	19.7 cts.	147,792,119	90.78
1949	718,020,000	19.7 cts.	141,449,940	17.7 cts.	127,092,771	89.85
1950	806,602,000	20.8 cts.	167,773,216	18.8 cts.	151,650,214	90.39
1951	831,740,000	24.2 cts.	201,281,080	22.2 cts.	184,655,263	91.74
TOTAL	3,839,040,000	21.545 cts.	\$ 827,118,310	19.545 cts.	\$ 750,359,066	90.72

L E A D A N D Z I N C C O M B I N E D

Year	Lbs. Lead and Zinc Produced	U.S.B.M. Valuation of Lead & Zinc	% of Bureau of Mines Valuation	Value of Lead - Zinc Leaving State
1947	166,420,000	\$ 21,450,856	59.18	\$ 12,694,616
1948	168,754,000	25,194,990	55.85	14,071,402
1949	208,452,000	28,130,672	50.70	14,262,250
1950	173,726,000	24,299,730	50.19	12,196,034
1951	140,786,000	25,309,960	57.85	15,083,714
TOTAL	858,138,000	\$ 124,386,208	54.92	\$ 68,308,016

C O P P E R, L E A D, Z I N C, G O L D A N D S I L V E R

Year	U.S.B.M. Valuation of Copper, Lead, Zinc, Gold and Silver	Value of Copper, Lead, Zinc, Gold, Silver Leaving State	% of Bureau of Mines Valuation	Value of Metal Production Indicated by Sales Tax Reports Plus Gold and Silver
1947	\$ 182,752,537	\$ 159,353,436	87.20	\$ 166,598,364
1948	196,207,948	170,073,965	86.68	179,122,472
1949	177,894,134	149,668,543	84.13	168,314,262
1950	201,033,694	172,806,956	85.96	180,304,709
1951	235,289,045	208,436,982	88.59	222,901,284
TOTAL	\$ 993,177,358	\$ 860,339,882	86.62	\$ 917,241,091

PER YEAR	\$ 198,635,472	\$ 172,067,976	86.62	\$ 183,448,218
Value of Metal Production based on Sales Tax - % of Bureau of Mines Valuation - - -				92.35

Arizona Department of Mineral Resources
October, 1952

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