

E. J. Shea

STATEMENT 1943

Walker Mining Company

PLUMAS COUNTY, CALIFORNIA
P. O. WALKERMINE, CALIFORNIA

OPERATING OFFICE
KEARNS BUILDING, SALT LAKE CITY, UTAH

(Incorporated under the laws of the State of Arizona)

Capital Stock

Common—Authorized.....1,750,000 shares at \$1.00 per share
Issued.....1,749,308 shares at \$1.00 per share

Directors

J. R. WALKER E. L. MAY J. O. ELTON J. B. WHITEHILL
P. T. FARNSWORTH, JR. J. F. DUGAN
JOHN C. BAGLIN

Officers

J. R. Walker, *President*
J. O. Elton, *Vice-President*
J. B. Whitehill, *Secretary-Treasurer*

Transfer Agents

H. I. Carson, Transfer Agent, 25 Broadway, New York City, N. Y.
Rom Warburton, Transfer Agent, 821 Kearns Building, Salt Lake City, Utah

Annual Meeting: May 2, 1944, at 3:00 P. M. in Room 202, Phoenix National Bank Building
Phoenix, Arizona

MIN 00001611

To the Stockholders of
Walker Mining Company

Your company did not operate during the year 1943. It was closed down in October 1941, and the conditions which caused the shutdown, as given in the 1941 Annual Report, have not materially changed.

Three to six men were employed as caretakers and watchmen, who kept the plant and mine in as good repair as possible with so small a crew.

The financial statements for the year ending December 31, 1943, certified by Messrs. Pogson, Peloubet and Company, Certified Public Accountants, are submitted for your information.

Respectfully,

J. R. WALKER,

President

Salt Lake City, Utah, March 31, 1944.

MIN 00001612

Walker Mining Company

BALANCE SHEET—DECEMBER 31, 1943

ASSETS

Mines and mining claims.....		\$ 1,286,088.33
Operations were discontinued in October 1941. (See report of President). For basis of valuation see note A.		
Plant and equipment at mine, mill, camp and shops and aerial tramway	\$ 1,631,691.26	
Less reserve for depreciation.....	1,301,427.31	330,263.95
Expenses prepaid		290.02
Insurance fund deposit (securities at cost).....		32,287.50
Supplies on hand—at cost		130,200.44
Accounts receivable		787.72
Cash		18,564.09
		\$ 1,798,482.05

LIABILITIES

Capital stock:		
Authorized—1,750,000 shares of the par value of \$1.00 each		
Issued and outstanding—1,749,308 shares.....		\$ 1,749,308.00
Deficit, without deduction for depletion:		
Balance December 31, 1942.....	\$ 440,183.49	
Net loss of the year	38,350.00	478,533.49
		1,270,774.51
Accounts and wages payable and taxes accrued		2,136.04
Indebtedness to International Smelting and Refining Company—see note B.....		509,765.68
Reserve for workmen's compensation insurance		15,805.82
		\$ 1,798,482.05

INCOME ACCOUNT—YEAR ENDED DECEMBER 31, 1943

Maintenance of property and sundry expenses.....		\$ 27,389.76
Interest on note payable to International Smelting and Refining Company.....		12,122.74
		39,512.50
Less interest received		1,162.50
Net loss		\$ 38,350.00

MIN 00001613

Walker Mining Company

NOTES TO FINANCIAL STATEMENTS

NOTE A—FIXED ASSETS—BASIS OF VALUATION

Mines and mining claims and plant and equipment at mine, mill camp and shops and aerial tramway of Walker Mining Company are carried on its books at cost, such cost being represented in the case of mines and mining claims to the extent of \$1,250,000.00 by par value of capital stock issued therefor and in the case of all other fixed assets by cash cost thereof.

Depreciation reserve up to cessation of operations was accumulated on a unit of production basis.

In order to comply with the Government income tax requirements for the purpose of computing depletion, additional entries respecting the valuation of the mining property have been recorded upon the books of the Company; but being made in compliance with the Regulations of the Bureau of Internal Revenue only, the result of such entries is omitted from the current statements.

The values of fixed assets are shown on the bases above set forth and do not indicate current values which could be established only by current appraisals.

NOTE B — INDEBTEDNESS TO INTERNATIONAL SMELTING AND REFINING COMPANY

Payment of this indebtedness has been demanded by International Smelting and Refining Company not later than April 1, 1944.

*To the Board of Directors,
Walker Mining Company,
Salt Lake City, Utah.*

We have examined the Balance Sheet of Walker Mining Company as of December 31, 1943 and its Income and Surplus Accounts for the calendar year 1943, have reviewed the system of internal control and the accounting procedures of the Company and, without making a detailed audit of the transactions, have examined or tested accounting records of the Company and other supporting evidence, by methods and to the extent we deemed appropriate. Our examination was made in accordance with generally accepted auditing standards applicable in the circumstances and included all procedures which we considered necessary.

Values of mines and mining claims are stated at cost and do not indicate current values. Mining operations were discontinued in October 1941 and there is no present prospect of their resumption. The Company's activities during the year were confined to maintenance of properties.

In our opinion the accompanying Balance Sheet and related Income and Surplus accounts, together with notes attached thereto or appearing thereon, subject to the explanation in the preceding paragraphs, present fairly the position of Walker Mining Company at December 31, 1943 and the results of its operations for the calendar year 1943 in conformity with generally accepted accounting principles applied on a basis consistent in all material respects with that of the preceding year.

POGSON, PELOUBET & CO.,
Certified Public Accountants

New York, March 15, 1944

MIN 000001614

Published December 16, 1935

SECURITIES AND EXCHANGE COMMISSION

PHILADELPHIA

FORM 10-K
FOR CORPORATIONS

ANNUAL REPORT

For Fiscal Year Ended December 31, 1943WALKER MINING COMPANY

(Name of registrant)

818 Kearns Building, Salt Lake City, Utah

(Address of principal executive offices)

State of Arizona - October 23, 1913

(The State or other sovereign power under which incorporated and date of incorporation)

Charter terminated October 23rd, 1938. An extension was
obtained, which extension terminates October 23rd, 1963.

(Date of termination of charter)

First Tuesday in May at 3:00 O'clock P. M. in
Phoenix, Arizona

(Date and place of annual meetings)

TABLE OF SECURITIES REGISTERED

SECURITIES REGISTERED			Names of exchanges on which registered
Title of issue	Amount as of close of fiscal year		
	Amount as to which registration is effective	Amount to be regis- tered upon notice of issuance	
Capital Stock - Common Par value \$1.00 Non-assessable	1,749,308	692	Salt Lake Stock Exchange
Capital Stock - Common Par Value \$1.00 Non-assessable	1,749,308		New York Curb Exchange

Name and address of person authorized to receive notices and communications from the
Securities and Exchange Commission:Rom Warburton, Cashier
Walker Mining Company
818 Kearns Building
Salt Lake City, Utah

MIN 00012597

The information required to be given under the items herein set forth is more specifically defined in the Instruction Book for Form 10-K for Corporations.

The instruction book also sets forth requirements as to exhibits which are to accompany the annual report.

AFFILIATIONS

1. List the following and indicate the respective percentages of voting power, or other basis of control, as required by the instructions:

(a) All subsidiaries of the registrant.

(b) All parents of the registrant.

(a) No subsidiaries

(b) Anaconda Copper Mining Company
International Smelting and Refining Company (100%)
Walker Mining Company (50.42%)

MANAGEMENT AND CONTROL

2. List the names and addresses of all directors and officers of the registrant. Indicate the office or offices held. If any person is both an officer and director, so state.

Name	Address	Office
J. R. Walker	Boston Building Salt Lake City, Utah	President and Director
J. O. Elton	818 Kearns Building Salt Lake City, Utah	Vice-President and Director
J. B. Whitehill	818 Kearns Building Salt Lake City, Utah	Secretary-Treasurer and Director
Jas. Dickson	25 Broadway New York, N. Y.	Asst. Secretary
E. O. Sowerwine	25 Broadway New York, N. Y.	Asst. Secretary
J. H. Collins	818 Kearns Building Salt Lake City, Utah	Asst. Secretary
P. T. Farnsworth, Jr.	Walker Bank Building Salt Lake City, Utah	Director
J. F. Dugan	818 Kearns Building Salt Lake City, Utah	Director
Earl L. May	c/o Lundin & May Salt Lake City, Utah	Director
J. C. Baglin	Felt Building Salt Lake City, Utah	Director
P. J. Geisler	25 Broadway New York, N. Y.	Vice-President
A. R. Mueller	25 Broadway New York, N. Y.	Asst. Secretary

MIN 000012599

3. Give the information required below for all persons owning of record more than 10 percent of any class of equity securities of the registrant.

As of **April 1, 1944** (insert date within 93 days)

Name and address	Title of issue	Amount owned	Percent of the class
International Smelting and Refining Co. 618 Kearns Building Salt Lake City, Utah	Capital Stock - Common	682,000	50.42%

5. State briefly the general effect of: (a) Material changes, made within the fiscal year and not previously reported, in contracts and arrangements of the categories enumerated below which have been previously reported; (b) such contracts and arrangements, made or in effect within the fiscal year and not previously reported, including the dates thereof and names of parties thereto.
- (i) Material management or general supervisory contracts providing for management of, or services to, the registrant or any of its subsidiaries.
 - (ii) Material advisory, construction or service contracts with affiliates providing for management of, or services to, the registrant or any of its subsidiaries.
 - (iii) Material contracts, except as provided by the instructions, between the registrant or any affiliate of the registrant on the one hand, and, on the other hand, any director or officer of the registrant, any principal underwriter of any securities of the registrant sold by the registrant within the past 3 fiscal years, or any security holder named in answer to item 3.
 - (iv) Material bonus and profit-sharing arrangements.

(i) None

(ii) None

(iii) None

(iv) None

6. As to any options outstanding at the close of the fiscal year to purchase securities of the registrant from the registrant: (a) State the amount, with the title of the issue, called for by such options; (b) outline briefly the prices, expiration dates, and other material conditions on which such options may be exercised; (c) give the name and address of each person holding such options calling for more than 5 percent of the total amount subject to option, and give the amount called for by the options of each such person; and (d) for each class of such options not previously reported state the consideration for the granting thereof.

No such options outstanding at the close of the fiscal year.

BUSINESS

7. Describe briefly the material changes which may have occurred within the fiscal year in the general character of the business done by the registrant and its subsidiaries.

There have been no changes within the fiscal year.

(The International Smelting and Refining Company have demanded payment, not later than April 1, 1944, of the indebtedness due them, which amounted to \$509,765.68 as at December 31, 1943.)

FINANCIAL STATEMENTS

8. Submit financial statements in accordance with the instructions and the rules and regulations of the Commission supplementary thereto.

(The financial statements shall be bound as a separate part of the annual report and attached to it following the signature page.)

(See financial statements and schedules following page 11)

REMUNERATION OF DIRECTORS, OFFICERS, AND OTHERS

9. Give the information required below in tabular form concerning the aggregate remuneration paid by the registrant and its subsidiaries, directly or indirectly, to the following persons in all of their capacities:
- The name and aggregate remuneration of each person among the officers, directors, and employees of the registrant receiving one of the three highest aggregate amounts of remuneration.
 - The aggregate remuneration of all directors of the registrant; indicate the number of such directors without naming them.
 - The aggregate remuneration of all officers, other than those who are directors, of the registrant; indicate the number of such officers without naming them.
 - The aggregate remuneration of all employees of the registrant who, respectively, received remuneration from the registrant in excess of \$20,000 within the fiscal year; indicate the number of such employees without naming them.

Name, or number of persons not named	Capacities in which remuneration was received	Aggregate remuneration within registrant's fiscal year
(a) Frank Irwin John R. Hutchinson Edward A. Harris	Clerk Caretaker Watchman	\$ 2,734.83 2,474.31 1,785.80
(b) 7	Directors	110.00
(c) 4	Asst. Secretaries	None
(d) None	None	None

10. State the name of, and amount received by, each person who received as bonuses or shares in profits \$30,000, or more, from the registrant or its wholly-owned subsidiaries, during the fiscal year.

None

11. Give the information required below in tabular form concerning the aggregate remuneration paid by the registrant, directly or indirectly, to any person, other than a director, officer, or employee, whose aggregate remuneration from the registrant, in all capacities, exceeded \$20,000 during the fiscal year.

Name	Capacities in which remuneration was received from the registrant	Aggregate remuneration during registrant's fiscal year
None		

SALES OF SECURITIES BY REGISTRANT

12. Furnish the following information as to all securities of the registrant sold by the registrant within the fiscal year:
- (a) Title of issue; and, if stock, the par value, or, if no par, stated value, if any.
 - (b) Amount sold.
 - (c) Date of sale.
 - (d) Aggregate net cash proceeds, or the nature and aggregate amount of any consideration other than cash, received by the registrant.
 - (e) Names of principal underwriters, if any, indicating any such underwriters as were affiliates of the registrant.
 - (f) A statement that such securities were registered under the Securities Act of 1933, or a brief statement of the facts necessary to establish that such registration was not required.

There were no securities of the registrant sold by the registrant within the fiscal year.

13. As to any securities for which application for registration under the Securities Exchange Act of 1934 had been filed and which remained unissued at the close of the fiscal year, furnish the following information:
- (a) Title of issue.
 - (b) The total amount unissued at the close of the fiscal year.
 - (c) A brief description of the proposed transactions for the issuance of such securities.

- (a) **Capital Stock - Common**
- (b) **692 shares**
- (c) **None proposed**

DESCRIPTION OF SECURITIES

14. (a) If any material modifications, not previously reported, have been made in any security a description of which has previously been reported, or in the indenture, charter, or other constituent instrument defining rights of the holders of such security, give the title of the issue and state briefly the general effect of such modifications.
- (b) For each class of capital stock of the registrant a description of which has not previously been reported, and which, either as to dividends or on liquidation, ranks equal or prior to any stock registered on a national securities exchange, outline briefly: (1) Dividend rights; (2) limitations in any indentures or other agreements on the payment of dividends; (3) voting rights; (4) liquidation rights; (5) preemptive rights; (6) subscription rights; (7) conversion rights; (8) redemption provisions applicable thereto; and (9) liability to further calls.
- (a) **No changes**
 - (b) **None**

15. State briefly the general effect of—

- (a) Any material modifications, made within the fiscal year and not previously reported, in contracts of guarantee by the registrant of the securities of other issuers, which have been previously reported.
- (b) Any such contracts made within the fiscal year and not previously reported.

(a) **No changes**

(b) **None**

This annual report comprises—

- (1) Pages numbered 1 to 11, consecutively, and insert pages numbered _____, including the following financial statements and schedules:

(See financial statements and schedules following page 11)

(2) The following exhibits:

None

This annual report is filed subject to the instructions contained in the Instruction Book for Form 10-K for Corporations, and amendments numbered 1

SIGNATURE

In pursuance of the requirements of the Securities Exchange Act of 1934, the registrant WALKER MINING COMPANY, a corporation organized and existing under the laws of Arizona, has duly caused this annual report to be signed on its behalf by the undersigned, thereunto duly authorized, and its seal to be hereunto affixed and attested, all in the city of Salt Lake and State of Utah on the 22 day of April, 1944

WALKER MINING COMPANY

(Signature of registrant)

By _____ (Name and title) **President**

[SEAL]

Attest:

(Name and title) **Secretary**

POGSON, PELOUBET & CO.
CERTIFIED PUBLIC ACCOUNTANTS

PERCY W. POGSON
MAURICE E. PELOUBET
LEWIS M. NORTON
SIDNEY W. PELOUBET
HOWARD L. GUYETT
CRAWFORD C. HALBEY

NEW YORK 4, N. Y.
25 BROADWAY
EL PASO, TEXAS
MILLS BUILDING

NEW YORK

Walker Mining Company,
Salt Lake City,
Utah.

We have examined the financial statements (as described below) of Walker Mining Company, have reviewed its system of internal control and accounting procedures and, without making a detailed audit of the transactions, have examined or tested its accounting records and other supporting evidence, by methods and to the extent we deemed appropriate. Our examination was made in accordance with generally accepted auditing standards applicable in the circumstances, and included all procedures which we considered necessary. These financial statements are set forth in the annual report Form 10 K for the calendar year 1943 of Walker Mining Company to be filed pursuant to Section 13 (a) and (b) of the Securities Exchange Act of 1934 and the Regulations of the Securities and Exchange Commission made thereunder and comprise:

The Balance Sheet as of December 31, 1943 of Walker Mining Company (which corporation is hereinafter sometimes referred to as the registrant) and its Profit and Loss Statement and Statement of Surplus for the calendar year 1943, together with other supporting schedules referred to on page 10.

Values of mines and mining claims are stated at cost and do not indicate current values. Mining operations were discontinued in October 1941 and there is no present prospect of their resumption. The company's activities during the year were confined to maintenance of properties.

In our opinion, the accompanying Balance Sheet and related Profit and Loss Statement and Statement of Surplus and other supporting schedules referred to above and hereto annexed, together with the notes attached thereto or appearing thereon, subject to the explanation in the preceding paragraphs, present fairly the position of the registrant at December 31, 1943 and the results of its operations for the calendar year 1943, in conformity with generally accepted accounting principles applied on a basis consistent in all material respects with that of the preceding year.


POGSON, PELOUBET & CO.

Certified Public Accountants

New York, April 15, 1944

MIN 000012609

WALKER MINING COMPANYFINANCIAL STATEMENTS AND SCHEDULES SUBMITTED

Certificate of Messrs. Pogson, Peloubet & Co., Certified Public Accountants, dated April 15, 1944, with respect to the financial statements and schedules listed below:

Balance Sheet as of December 31, 1943
 Profit and Loss Statement for the calendar year 1943
 Statement of Surplus for the calendar year 1943
 Schedule V - Property, plant and equipment
 Schedule VI - Reserves for depreciation, depletion and amortization of property, plant and equipment
 Schedule XII - Reserves
 Schedule XVI - Supplementary profit and loss information

SCHEDULES OMITTED

Schedule I - Marketable securities - Other security investments
 Marketable securities
 Schedule is not applicable

Other security investments
 Omitted in accordance with Rule 5-04, Schedule I (2) of Regulation S-X

Schedule II - Amounts due from directors, officers and principal holders of equity securities other than affiliates
 Schedule III - Investments in securities of affiliates
 Schedule IV - Indebtedness of affiliates - Not current
 Schedules are not applicable

Schedule VII - Intangible assets
 Schedule VIII - Reserves for depreciation and amortization of intangible assets
 Schedule IX - Funded debt
 Schedule X - Indebtedness to affiliates - Not current
 Schedule XI - Guarantees of securities of other issuers
 Schedules are not applicable

Schedule XIII - Capital shares
 Omitted in accordance with Rule 5-04 (a) (1) of Regulation S-X

Schedule XIV - Warrants or rights
 Schedule XV - Other securities
 Schedule XVII - Income from dividends - Equity in net profit and loss of affiliates
 Schedules are not applicable

WALKER MINING COMPANYBALANCE SHEET - DECEMBER 31, 1943

See explanatory notes on following page, which are an integral
part of this Balance Sheet

ASSETS AND OTHER DEBITS

CURRENT ASSETS:

Cash on hand and in banks	\$	18,564.09	
Accounts receivable		787.72	
Supplies on hand - at average cost		<u>130,200.44</u>	149,552.25

INSURANCE FUND DEPOSIT (securities at cost)			32,287.50
---	--	--	-----------

PROPERTY, PLANT AND EQUIPMENT - see note A:

Mines and mining claims - schedule V		1,286,088.33	
--------------------------------------	--	--------------	--

Operations were discontinued in
October 1941. For basis of valuation
see note A.

Buildings and machinery at mine, mill, camp and shops and aerial tram- way - schedule V	\$	1,631,691.26	
Less reserve for depreciation - schedule VI		<u>1,301,427.31</u>	<u>330,263.95</u>
			1,616,352.28

DEFERRED CHARGES:

Prepaid expenses			<u>290.02</u>
			\$ <u>1,798,482.05</u>

LIABILITIES, CAPITAL SHARES AND SURPLUS

CURRENT LIABILITIES:

Accounts payable - trade	\$	1,356.43	
Wages payable		431.75	
Accrued taxes		347.86	
Indebtedness to International Smelt- ing and Refining Company - see note C		<u>509,765.68</u>	511,901.72

RESERVE FOR WORKMEN'S COMPENSATION

INSURANCE - schedule XII			15,805.82
--------------------------	--	--	-----------

CAPITAL SHARES AND SURPLUS:

Capital stock - see note B:			
Authorized - 1,750,000 shares of the par value of \$1.00 each			
Issued and outstanding - 1,749,308 shares		1,749,308.00	
Deficit - see Statement of Surplus		<u>478,533.49</u>	<u>1,270,774.51</u>
			\$ <u>1,798,482.05</u>

WALKER MINING COMPANY

NOTES TO BALANCE SHEET

NOTE A - PROPERTY, PLANT AND EQUIPMENT - BASIS OF VALUATION

- (a) Mines and mining claims and buildings and machinery at mine, mill, camp and shops and aerial tramway are carried at cost, such cost being represented in the case of mines and mining claims to the extent of \$1,250,000 by par value of capital stock issued therefor and in the case of all other fixed assets by cash cost thereof.
- (b) Prior to the cessation of operations it was the practice of the registrant to accumulate depreciation reserve on a unit of production basis.
- (c) The registrant has consistently followed the practice of not deducting in any of its financial statements, any amount for depletion on account of metals mined, and no such deduction is included in any of the financial statements submitted herewith.

In order to comply with the Government income tax requirements for the purpose of computing depletion, additional entries respecting the valuation of the mining property have been recorded upon the books of the registrant but being made in compliance with the Regulations of the Bureau of Internal Revenue only, the result of such entries is omitted from the current statements.

- (d) The values of property, plant and equipment are shown on the bases above set forth and do not indicate current values which could be established only by current appraisals.

NOTE B - CAPITAL STOCK

No shares are reserved for officers and employees or for options, warrants, conversions and other rights.

NOTE C - INDEBTEDNESS TO INTERNATIONAL SMELTING AND REFINING COMPANY

Payment of this indebtedness was demanded by International Smelting and Refining Company not later than April 1, 1944.

WALKER MINING COMPANYPROFIT AND LOSS STATEMENTYEAR ENDED DECEMBER 31, 1943

Maintenance of property and sundry expenses	\$ 25,514.00
General and administrative expense	<u>1,875.76</u>
	27,389.76
Interest on note payable to International Smelting and Refining Company	<u>12,122.74</u>
	39,512.50
Less interest received	<u>1,162.50</u>
Net Loss	<u>\$ 38,350.00</u>

See note A to Balance Sheet.

MIN 000012613

WALKER MINING COMPANYSTATEMENT OF SURPLUSYEAR ENDED DECEMBER 31, 1943

Deficit, December 31, 1942, without deduction for depletion	\$ 440,183.49
Net loss	38,350.00
	<hr/>
Deficit, December 31, 1943, without deduction for depletion	\$ 478,533.49
	<hr/>

MIN 000012614

PROPERTY, PLANT AND EQUIPMENT

<u>Column A</u>	<u>Column F</u>
<u>Classification</u>	Balance at close <u>of period</u>
<u>Mines, mining claims and development</u>	
Mines and mining claims	\$ 1,286,088.33
	<hr/>
<u>Buildings and machinery at mine, mill, camp and shops and aerial tramway</u>	
Mine, mill and shop buildings and equipment	\$ 1,002,739.36
Mill camp buildings and equipment	299,835.67
Aerial tramway	224,906.56
Dam construction	82,730.32
Miscellaneous	21,479.35
	<hr/>
	\$ 1,631,691.26
	<hr/>

NOTE - There have been no changes in the above accounts during the year.

RESERVES FOR DEPRECIATION, DEPLETION AND AMORTIZATION
OF PROPERTY, PLANT AND EQUIPMENT

<u>Column A</u>	<u>Column E</u>
<u>Description</u>	Balance at close <u>of period</u>
Reserve for depreciation of buildings and machinery at mine, mill, camp and shops and aerial tramway	\$ 1,301,427.31
	<hr/>

NOTE 1 - There has been no change during the year.

NOTE 2 - See note A (c) to Balance Sheet.

RESERVES

<u>Column A</u>	<u>Column B</u>	<u>Column D</u>	<u>Column E</u>
<u>Description</u>	<u>Balance at beginning of period</u>	<u>Deductions from reserve</u>	<u>Balance at close of period</u>
Reserve for workmen's compensation insurance	\$ 22,935.67	7,129.85 (1)	15,805.82

NOTE 1 - Compensation paid and expenses.

SUPPLEMENTARY PROFIT AND LOSS INFORMATION

<u>Column A</u>	<u>Column B</u>	<u>Column</u>
<u>Item</u>	Charged directly to Profit and Loss - to costs or operating <u>expenses</u>	<u>Total</u>
1. Maintenance and repairs		None
2. Depreciation, depletion and amortization of fixed and in- tangible assets (or charges in lieu thereof)		None
3. Taxes, other than income and excess profits taxes	\$ 1,802.34	1,802.3
4. Management and service contract fees		None
5. Rents and royalties		None

NOTE - The items as shown above contain all charges of a material amount falling under the different classifications. An analysis of the operating accounts has been made with a view to segregating all items of a material amount falling under these classifications.

C
O
P
Y

United States
SECURITIES AND EXCHANGE COMMISSION 1-1528
18th and Locost Streets
PHILADELPHIA, PENNSYLVANIA 3

July 19, 1944

Mr. Rom Warburton, Cashier
Walker Mining Company
P. O. BOX 1079
Salt Lake City 10, Utah

Dear Sir:

This will acknowledge your letter of July 5, 1944, in respect of our letter of March 14, 1944, wherein it was suggested that in view of the cessation of operations because of unfavorable ore development and inability to operate profitably, charges should be made to deficit account for all losses, including write-down of fixed assets, and development no longer used or useful.

You advise us that on June 7, 1944, petition was filed in the District Court of the United States in and for the Northern District of California, Northern Division, for a reorganization of the Walker Mining Company under Chapter X of an act of Congress of the United States entitled "An Act to Establish a Uniform System of Bankruptcy throughout the United States."

In view of this action, changes in the financial statements in respect of our suggestion may be deferred until the present proceedings are completed. However, with regard to financial Statements to be included in the annual reports filed in the future, a note should be appended to the Financial Statements setting forth the filing of the petition under the aforesaid Chapter X, together with an appropriate statement of the status of the matter. In addition, the recent negative operating and developmental results and questionable value of the properties should be disclosed in a footnote to the balance sheet.

Very truly yours,

/s/ Ernest W. Ramspeck
Assistant Director
Corporation Finance Division

COPY

MIN 000012585

INTERNATIONAL SMELTING AND REFINING COMPANY

25 Broadway, New York 4, N.Y.

September **RECEIVED**
SEP 28 1944
W. K. DALY

Mr. Rom Warburton, Cashier,
International Smelting and Refining Co.,
Kearns Building,
Salt Lake City 10, Utah.

Dear Sir:

We have just received copy of Order from the Court under date of September 14, 1944 outlining procedure for filing claims, etc. in the Walker Mining Company case, the original of which I gave to Mr. Hoover.

I presume that you and Mr. Stephenson are attending to all of the details of this case as the Utah Court is in charge. You have, of course, a record of stock certificates which our books show to be as follows:

<u>Ctf. No.</u>	<u>In Name Of</u>	<u>No. of Shares</u>
1155	International Smelting Company	630,000
3567	" "	252,000
6979	J. B. Whitehill	10
6980	J. O. Elton	10
3653	John F. Dugan	12
14825	P. T. Farnsworth, Jr.	10
	Total	882,042

These shares are carried on our books at a cost of \$882,049.50.

It is my understanding that all notes received from Walker Mining Company are in your possession, and that you have, for the purpose of this action, accrued interest up to date of Receivorship. You also have the details and are in position to file any items of open account claims.

I am advised also that in the pre-payment of fire insurance by the Butte Office of Anaconda Copper Mining Company a charge for the premium payment was sent to you by Mr. Frazer. If that bill was not paid by Walker Mining Company while funds were still available and prior to Receivorship, claim should be filed for Anaconda Copper Mining Company. Aside from the insurance invoice, I do not know of any other items on the books of

MIN 00001558

Mr. Rom Warburton

-2-

9/27/44.

Anaconda Copper Mining Company.

I am writing the above merely to make sure that there is no slip-up in the requirements of this action and will appreciate confirmation from you that all matters pertaining to the Walker Receivorship are being attended to by the Salt Lake Office.

Very truly yours,

E. O. Sowerwine,
Secretary-Treasurer.

B

cc-Mr. W. H. Hoover
-Mr. Jas. Dickson
-Mr. W. K. Daly

MIN 000001559

C
O
P
Y

JAN 18 1945
E. O. SOWERWINE

IN THE UNITED STATES DISTRICT COURT
DISTRICT OF UTAH
CENTRAL DIVISION

IN THE MATTER OF : B-16087
WALKER MINING COMPANY, :
Debtor : MEMO DECISION

Having been appointed Special Master to hear the evidence and make findings of fact and conclusions of law on the claim of the International Smelting & Refining Company against the said Walker Mining Company on account of money claimed to be loaned to said Walker Mining Company, and to suggest to the Court a form of decree to be entered in the premises, and having heard all the evidence introduced and the arguments of counsel on said claim and the objections filed thereto, and the Special Master being of the opinion that said claim should be approved and allowed and that the evidence introduced thereon satisfactorily shows that the money advanced to said Walker Mining Company by claimant was loaned in good faith by said claimant and not with an ulterior motive to wreck the said Walker Mining Company, and that all the dealings of said claimant with said Walker Mining Company have been fair and free from fraudulent intent or practice, the Special Master finds the facts on said objections in favor of the claimant and against the objecting stockholders and directs that the attorney for the claimant prepare the formal findings of fact, conclusions of law and suggested decree and present the same, upon notice to the objecting stockholders, to the Special Master for consideration and approval.

That the claimant has for many years been the owner of a majority of the stock of the Walker Mining Company and has elected at all times since owning such majority stock a majority of the Board of Directors of the Mining Company. That under the law of the State of Arizona, in which State the Walker Mining Company was organized, the cumulative system of voting for the election of officers is provided by law, and at all times the minority stockholders of said Walker Mining Company have had the right and, if exercised, the ability to elect a portion of the directors of the Walker Mining Company, and at times have exercised that right; that by the power of electing a majority of the directors of such Mining Company the claimant has been in a position where it might have, if it had so designed, converted its power of control to sinister purposes and to the damage and prejudice of the minority stockholders, or likewise with the same power of control, it could have afforded great benefit to the stockholders of the Mining Company by providing for the efficient management and control and working of the Mining Company.

The Special Master is of the opinion that under the evidence as disclosed in this case it is clearly shown that by such control through the ownership of such majority stock of said Walker Mining Company, the Walker Mining Company has been greatly benefitted through exercising the available organization of the claimant for necessary services of experts and for office facilities furnished by the claimant corporation; that in all such dealings the International Smelting & Refining Company has treated the minority stockholders and other stockholders of the Walker Mining Company fairly, and is not guilty of any of the charges made by the objecting stockholders.

Dated at Salt Lake City, Utah,
January 15, 1945.

T. D. LEWIS
SPECIAL MASTER

Filed in United States District
Court, District of Utah
Jan 15 1945
V. P. Ahlstrom, Clerk
By _____ Deputy

IN THE UNITED STATES DISTRICT COURT IN AND FOR THE
DISTRICT OF UTAH, CENTRAL DIVISION

--o--o--o--o--

IN THE MATTER OF)
WALKER MINING COMPANY)

No. B 16087

Debtor)

D E C R E E

A full hearing before the Court of all objections to the Findings of Fact and Conclusions of Law of the Special Master herein with respect to the claim of International Smelting and Refining Company against debtor above named having been had and concluded on February 9, 1945, pursuant to stipulation of all parties concerned;

NOW, THEREFORE, the Court being fully advised in the premises, IT IS HEREBY ORDERED, ADJUDGED AND DECREED as follows:

1. That said Findings of Fact and Conclusions of Law of said Special Master be and they are hereby approved and adopted as the Findings of Fact and Conclusions of Law of this Court.

2. That Debtor is not and has never at any time been an alter ego or instrument or department of Anaconda Copper Mining Company or of International Smelting and Refining Company, hereinafter called Claimant.

3. That Debtor's business and affairs have at all times been carried on and conducted in the manner and according to the methods and practice usually employed by corporations free of any domination or control by others.

4. That no act or omission of said Anaconda Copper Mining Company or of said Claimant, their officers, agents and employees, or any of them, established by any evidence, constitutes or proves any domination or control by them or any of them over Debtor or any of Debtor's acts, business or affairs, or constituted fraud, or occasioned damage or prejudice to or violated any right of Debtor or any of its stockholders.

5. That any and all advances of money made by said Claimant to Debtor were thus made as loans and not as capital investments.

6. That on December 31, 1940, Debtor was indebted to Claimant in the principal sum, to wit, \$804,909.45, named in Debtor's promissory note to Claimant of that date; that on and prior to January 30, 1942, payments aggregating \$320,000.00 were made on the principal sum named in said promissory note, thus leaving a balance of principal sum remaining unpaid of \$484,909.45; that on said January 30, 1942, there was accrued interest on unpaid balances due and owing to Claimant pursuant to the terms of said promissory note aggregating \$1,219.69; that no part of said last mentioned interest and no part of said \$484,909.45 or of interest accruing on said last mentioned sum since said January 30, 1942, has been paid; that on October 16, 1944, said unpaid balance of principal sum, to wit, \$484,909.45, plus interest thereon at said agreed rate of two and a half per cent per annum, plus said unpaid interest item of \$1,219.69 aggregated the sum of \$519,016.88 as set forth in Claimant's proof of claim on file herein; that there is now unpaid, due and owing from Debtor to Claimant said principal sum of \$484,909.45, plus interest thereon at said rate of two and a half per cent per annum from and after said January 30, 1942, plus said interest item aggregating \$1,219.69, and that the whole thereof be and is hereby approved and allowed as a valid indebtedness due and owing from Debtor to Said Claimant.

7. That any and every objection to the Claim made by said Claimant against Debtor for said indebtedness be and they are hereby dismissed.

8. That said Claimant recover from and have judgment herein against the persons who filed objections herein against said claim of said Claimant against

MIN 00001533

debtor, to wit; George E. Baglin, George Baglin, S. J. Price, Edwin McCarthy, J. T. Evans, Albert Penhale, Beatrice L. Penhale and Hulda Van Steeter and each of them for its costs necessarily expended upon the hearing on said objections before said Special Master, said costs to be taxed herein.

Done this 10th day of February, 1945.

TILLMAN D. JOHNSON

JUDGE

Received a copy hereof this 10th day of February, 1945, and subject to objections heretofore filed herein, consent is hereby given that said Decree may be signed forthwith.

HARRY D. PUGSLEY

Attorney for all stockholders objecting
to claim of International Smelting and
Refining Company

MIN 000001534

GERALD R. JOHNSON, ESQ.,
1100 California State Life Bldg.,
Sacramento 14, California.
Attorney for Trustee.

IN THE UNITED STATES DISTRICT COURT IN AND FOR THE DISTRICT OF UTAH
CENTRAL DIVISION

IN PROCEEDINGS FOR THE REORGANIZATION OF A CORPORATION

In the Matter of

WALKER MINING COMPANY,
Debtor.

No. B. 16087

**BRIEF STATEMENT OF TRUSTEE'S INVESTIGATION (ETC.) PURSUANT
TO SECTION 167(5) OF THE ACT OF CONGRESS RELATING TO BANK-
RUPTCY**

Willard H. Davis, Trustee of the Walker Mining Company, a corporation, the above named debtor, hereby submits a brief statement of his investigation of the property, liabilities and financial condition of said debtor, the operation of its business and the desirability of the continuance thereof.

PROPERTY OF DEBTOR

The property of the said debtor consists of extensive mining ground in Plumas County, State of California, where all of its mining and milling operations have been carried on since the date of its organization. The cost of debtor's concentrating mill and all machinery, equipment, buildings and other property constituting its plant on said mining property was approximately \$1,630,000.00, in addition to which it has on hand warehouse supplies acquired by it at a cost of approximately \$130,000.00. Many miles of underground workings have been excavated and extensive diamond drilling has been carried on at said mining property.

LIABILITIES OF THE DEBTOR

The liabilities of the debtor as represented by claims which have been filed with the Clerk of the above entitled court total \$530,460.01, of which \$519,016.88 plus some additional interest accumulated since October 16, 1944 is owing to the International Smelting & Refining Company on a promissory note dated December 31, 1943, bearing interest at 2 1/4% per annum, the remainder of debtor's indebtedness consisting of \$4,628.00 owing to the Anasazi Copper Mining Company for advances made for premiums on fire insurance, a tax claim in the sum of \$988.00, a labor claim for \$81.23 and fixed claims for injuries or death totalling \$5,760.90. There are also a number of potential claims under the Workmen's Compensation Act of the State of California, the amounts of which have not yet been determined.

Objections to the claim of the International Smelting & Refining Company were made by or on behalf of eight of debtor's stockholders. A hearing on said objections was commenced on December 15, 1944 and continued thereafter (excepting one Sunday, December 17, 1944)

until and including December 23, 1944. On February 10, 1945 the Honorable Tillman D. Johnson, District Judge, signed a decree in these proceedings approving and allowing said claim as a valid indebtedness due and owing from debtor to the International Smelting & Refining Company, in the principal sum of \$519,016.88 plus interest from October 16, 1944 at the rate of 2½% per annum.

FINANCIAL CONDITION

Debtor has no operating revenue inasmuch as all of its mining activities were terminated during the month of October, 1941. Consequently it has become necessary to borrow the sum of \$15,000.00 from the Continental National Bank & Trust Company of Salt Lake City, Utah, for the purpose of paying current expenses and for the preservation of debtor's estate. This indebtedness is in addition to that which has been hereinbefore mentioned.

OPERATION OF DEBTOR'S BUSINESS AND DESIRABILITY OF CONTINUANCE THEREOF

Since debtor's organization an aggregate of 362,696 dry tons of material have been produced from said mining property and mill and smelted by the International Smelting & Refining Company, of which 12,382 tons were crude ore and 350,813 tons were concentrates, lime scale, ball mill cleanings, precipitates and scrap copper. The net smelter returns of all of said material aggregated \$20,091,290.08, and without any deductions for railroad freight, sampling or smelter treatment charge, the aggregate value of all metal content principally copper, was \$22,243,025.26. Except for comparatively brief periods of suspension, mining and milling operations were carried on by debtor until the month of October, 1941, when said operations terminated. The mine activities were terminated for the reason that debtor's production cost at that time exceeded the selling price of 12c per pound for copper which had been previously fixed by the United States Government. The records reveal that debtor's production costs have always been high due to the low quality of ore mined and debtor's properties have always been classified by mining engineers as a high cost producer. On June 7, 1944 debtor filed a petition for reorganization which was approved on June 10, 1944.

By reason of the low grade of presently known ore bodies coupled with high production costs and the present price of copper, the Walker Mine cannot be operated at a profit. A few stockholders have indicated that further exploration might disclose high grade ore bodies in or near the Walker Mine properties, which would permit the mine to operate at a profit. It is not believed, however, that sufficient speculative capital, estimated at one million dollars, could be obtained for that purpose. Therefore, it is not desirable nor does it appear possible to resume mining operations. It further appears that reorganization of debtor is not possible and that the present proceedings should be terminated.

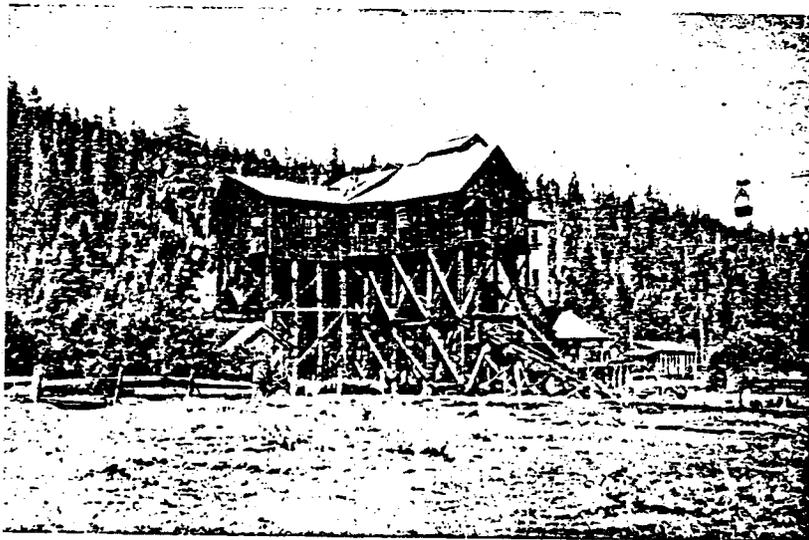
February 14, 1945.

WILLARD H. DAVIS, Trustee.

GERALD R. JOHNSON, ESQ.,
1100 California State Life Bldg.,
Sacramento 14, California.
Attorney for Trustee

The Walker mine was shut down from February, 1932, until the fall of 1935. In September, 1935, the mill was started and 500 to 600 tons of ore per day were treated. This has now been increased to 1200 tons per day. The last full year's operation was in 1931, and the following information is quoted from the annual report to stockholders for that year:

The mine operated 289 days during the year, part of the time on a basis of six days per week and part on a basis of five days per week, to curtail production. Average production per day was 1494 tons of ore and 16.8 tons of waste. After smelter deductions have been made the mine was credited with the production of 11,952,440 lbs. of copper, which after crediting the value of the gold and silver cost 8.8325¢ per lb. including development work. The latter with some miscellaneous charges cost \$99,523.41 or \$12.722 per foot on 7823 ft. New construction and equipment cost \$18,731.19.



Tramway terminal at Spring Garden, Walker Mining Co.

Operating costs per ton of crude ore for breaking, producing, milling and delivery of concentrates to Spring Garden were as follows:

	Tons	Amount	Cost per ton
Breaking, including development.....	424,452.00	\$428,907.86	\$1.0105
Producing	440,558.00	200,119.25	.4542
Total breaking, development and producing..	429,486.88	\$629,027.11	\$1.4647
Milling	432,294.00	235,341.04	.5444
Tramway 25,613.105 tons concentrate at average concentration ratio of 17.0853.....	436,916.00	16,145.97	.0370
Totals	430,348.00	\$880,514.12	\$2.0461

MIN 000011662

Brea
Ore milled
Average g
Average g
Average c
Average g
Average g
Average g
Dry tons

For
table of

Bro
close to
ties. Th
A rough
Porte, a
Allston
of the S
Gold, C
and one
homeste

On
respecti
vein str
width in
it swells
wide. Co
amphibol
wall of th
long. Or
tunnel on
a width c
80° NW
deep on
ries son

Th
lower (c
mill wit
Th

Bu
system
ing to
from 1
Niagar
Th
poratio
York;

1 of
1 of

Legend for Flowsheet of Crushing Plant and Concentrator

Number ¹	Description of machines
1	Track from mine.
2	One grizzly, 11-inch spaces.
3	One bin, 1500-ton capacity.
4	One pan conveyor, 42-inch.
5	One grizzly, 1½-inch spaces.
6	One Traylor jaw crusher, 15 by 24 inch.
7	Belt conveyor, 20-inch.
8	Electromagnet.
9	One grizzly, 1½-inch spaces.
10	Two Anaconda jaw crushers, 8 by 20 inch.
11	One bucket elevator, 16-inch.
12	One trommel screen, 1½-inch holes.
13	One set Anaconda rolls, 24 by 55 inch, set at 1-inch.
14	Two trommel screens, 1-inch holes.
15	One set Anaconda rolls, 24 by 55 inch, set at ¾ inch.
16	One bucket elevator, 16-inch.
17	One belt conveyor, 20-inch.
18	One tripper conveyor.
19	Fine-ore bin, 2400-ton capacity.
20	Four feed conveyor belts, 18-inch.
21	Four Marcy ball mills, three No. 75 and one No. 77.
22	Four scoop boxes.
23	Reagent feeders.
24	Four Dorr duplex classifiers, three 6 feet by 18 feet 4 inches and one 6 feet by 23 feet 4 inches.
25	One Galigher sampler for heads.
26	Eight Callow rougher flotation machines, two 3-foot 11-pan units per mill section.
27	Four primary Callow cleaner machines, one 3-foot 4-pan unit per mill section.
28	Four secondary Callow cleaner machines, one 18-inch hopped type unit per mill section.
29	Two Callow scavenger machines, 3-foot 7-pan units.
30	One middlings sump, tank capacity 2000 gallons.
31	Three Krogh pumps, 3-inch.
32	Two Dorr concentrates thickeners, 12 by 25 foot.
33	One Dorr thickener, 11 feet 4½ inches by 46 feet.
34	One centrifugal pump, 3-inch.
35	Water storage tank, capacity 100,000 gallons.
36	One bucket elevator, 16-inch.
37	One Oliver filter, 12 by 8 foot.
38	One Oliver vacuum pump, 14 by 8-inch.
39	One Oliver compressor, 9½ by 8-inch.
40	One belt conveyor, 18-inch.
41	Concentrates storage bin, 290-ton capacity.
42	One Galigher automatic sampler for tailings.
43	One centrifugal pump, 1½-inch.

¹ Refer to numbers of Figure 1.

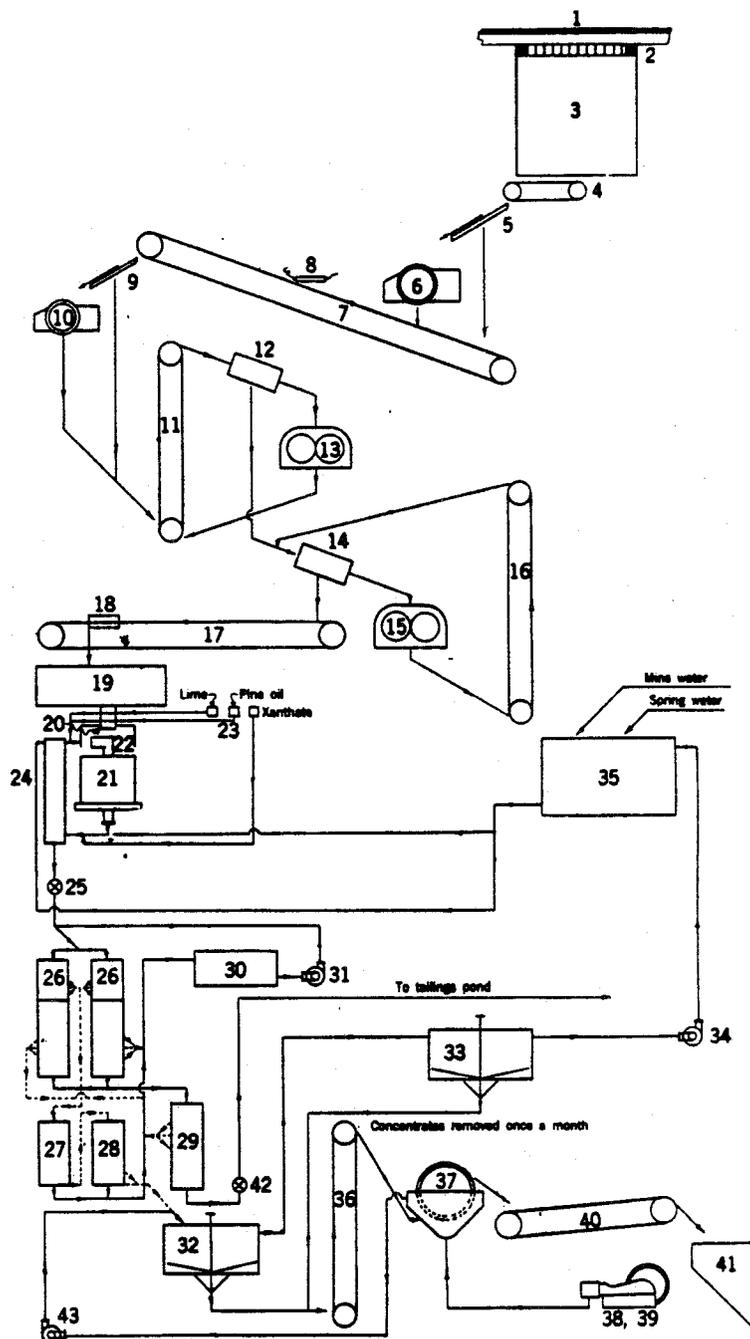


FIG. 1. Flow sheet of crushing plant and concentrator, Walker Mining Co.

ANACONDA COPPER MINING COMPANY
and Subsidiary Companies

NOTES TO CONSOLIDATED PROFIT AND LOSS STATEMENT

NOTE A - BASIS

- (a) Principles applying to this Consolidated Profit and Loss Statement are the same as set forth in note A to the general Consolidated Balance Sheet.
- (b) The net income attributable to the registrant of four small unconsolidated subsidiaries more than 75% owned, the operations of which are not an integral part of the operations of the consolidated group, amounted for the year ended December 31, 1941 to \$14,832.16.
- (c) Sales of metals and manufactured products are included in income as billed and delivered to customers. Undelivered sales contracts and purchase commitments are not given effect to in this Consolidated Profit and Loss Statement.

NOTE B - INTERCOMPANY SALES AND PROFITS

- (a) Sales to consolidated subsidiaries have been eliminated and the sales shown in this Consolidated Profit and Loss Statement include only sales to others than the registrant and consolidated subsidiaries.
- (b) Intercompany profits, where these are material, have been eliminated in this Consolidated Profit and Loss Statement. The principal intercompany transactions are sales of copper and other metals to manufacturing subsidiaries. The inventories of manufacturing subsidiaries include, so far as is ascertainable, no intercompany profit.
- (c) Any intercompany profits, resulting from transactions in connection with purchases and sales of supplies and furnishing of services, and in connection with refining and smelting operations, are not material in amount and have not been eliminated.
- (d) The principal transactions with unconsolidated subsidiaries consist of sales of copper and other metals to Anaconda Wire and Cable Company and smelting and refining on toll of ores and concentrates produced by Mountain City Copper Company and Walker Mining Company. These sales and tolls are included in this Consolidated Profit and Loss Statement as a separate item under the caption "Gross sales and earnings - To subsidiaries whose accounts are not consolidated in this Profit and Loss Statement." The greater part of the sales of metals during the year were made under the direction of the Office of Production Management or the War Production Board, or to the Metals Reserve Corporation, at prices and under conditions prescribed by those agencies.
The company's accounting system did not provide for the allocation of profit to particular lots of metals sold and it is impractical to determine the profit made on sales of metals to unconsolidated subsidiaries.
Smelting and refining tolls are charged on the same basis as those charged to outside customers. The nature of smelting operations is such that it is impractical to allocate profits to particular lots or to ore received from particular shippers. The company's accounting system makes no provision for such allocation.
- (e) Other transactions with unconsolidated subsidiaries not material in amount include sales of miscellaneous products and supplies which are made on the same basis as those to outside customers and furnishing of various services, principally of a technical nature, which are charged for at cost or approximate cost.

ANACONDA COPPER MINING COMPANY
and Subsidiary Companies

NOTES TO CONSOLIDATED PROFIT AND LOSS STATEMENT

(continued)

NOTE C - COST OF SALES

Inventories used in the computation of cost of sales are as follows:

	<u>Metals and manufactured products</u>	
	<u>In process</u>	<u>Finished</u>
At beginning of year	\$ 6,837,284.19	42,508,864.70
At end of year	7,037,733.36	36,114,142.03

See note D to general Consolidated Balance Sheet.

NOTE D - INCOME OF SUBSIDIARIES OPERATING IN FOREIGN COUNTRIES

- (a) There is included in consolidated income \$22,635,388.25 as Anaconda Copper Mining Company's proportion of the income of its domestic and foreign consolidated subsidiaries operating in Mexico and South America; and \$316,216.05 of the earnings of those companies has been apportioned to minority stockholders; all of which income has been received in United States funds.
- (b) There is included in consolidated income \$970,515.67 which is the equivalent (based on the average monthly exchange rates for the year) in United States currency of the net income for the year 1941 of Anaconda American Brass Limited, a wholly owned Canadian subsidiary, after adjustment resulting from the conversion of net current assets at rates in effect at December 31, 1941. No dividends were received from said subsidiary during the year. (See Note B to general Consolidated Balance Sheet).

NOTE E - SELLING, GENERAL AND ADMINISTRATIVE EXPENSES

It has been the practice of the registrant and subsidiaries to include in and not to segregate from cost of sales certain expenses which might, under some systems of classification, be considered selling, general and administrative expenses. These have been distributed to the processes and operations to which they apply. A survey of the operating accounts has been made for the year and expenses of material amount, which are clearly of a selling, general and administrative nature, have been segregated from the accounts to which they have been distributed and are shown separately in the Consolidated Profit and Loss Statement.

NOTE F - DISCOUNT AND EXPENSE AND PREMIUM ON DEBENTURES RETIRED

See Note K to general Consolidated Balance Sheet.

NOTE G - DIVIDENDS AND EARNINGS OF PRINCIPAL UNCONSOLIDATED SUBSIDIARIES

In the year 1941, the share of the registrant and consolidated subsidiaries in the combined net income (without, in the case of mining companies, making any provision for depletion of metal mines) of the principal unconsolidated subsidiaries

MIN 000012547

WALKERMINE - 1943

Walkermine was not being operated during World War II, but was being maintained so that operations could resume, if feasible, at a later date.

We visited the caretaker, Parnell "Red" Sisk, and his family for several days in October, and toured the mine with Red as he went about his caretaking duties.

The mine trolleys provided seating for four to six passengers and pulled one or more additional cars. The cars being pulled on our trip were used for hauling out rocks which had fallen into the tunnels. The alternating current delivered to the mine was converted to direct current for trolley operation by a transformer located at the mine site.

Our host and guide told me that the patches of concrete on the tunnel walls sealed valuable deposits of gold that were being saved for later mining, and I made plans to return with a pick; my husband discouraged dreams of riches when he told me that the concrete was only for support of tunnel walls and that Red was taking advantage of my gullibility.

My gullibility could have inspired the story about the grizzly as well. And for this story, it is my husband who claims to know a former Walkermine employee who quit in some haste when he was told to free the Grizzly. "I ain't turning no damn bear loose," was quoted as his parting remark.

The mine grizzly was located in the highest building on the mountain and was fed large pieces of ore by elevator. The large pieces of rock were "chewed" into smaller pieces by the grizzly, which occasionally became clogged and had to be freed by a charge of dynamite.

Unfortunately, there is no doubt about the truth of a collision of a trolley loaded with explosives entering the mine with a trolley carrying miners who were leaving; we saw the scars on the tunnel intersection, and were also shown the basket. The basket, standard equipment in underground mines, is divided into sections for re-assembling bits and pieces of a human body - a bit of left arm in one part, right thigh in another, torso in the center section, etc.

In above-ground locations we saw the tram cable around a wheel about fifteen feet in diameter, and the tram itself on a supply trip from Spring Garden.

The ball mill was especially interesting to us because of a feeling for the power of the rock. The mill, a large revolving tank, was used to break the ore into smaller pieces by collision with iron balls. The balls weighed about twelve pounds when put into service and became progressively smaller with use with some, still spherical, reduced to the size of a small marble and weighing less than an ounce.

MIN 000011635

The ore sample collection was also impressive, and indicated to us that the samples were a catalog of the composition of every cubic foot of the mountain. The samples were on diamond drill cores in boxes 6 to 8 inches wide, 2 to 3 inches deep, and 15 to 20 feet long.

The Walkermine area in October is beautiful with autumn color and we enjoyed having a complete town for ourselves, with long hikes in the day and uninterrupted bridge games in the evening. Our hosts used the superintendent's house as a guest cottage, and it wasn't a bad place to stay if one didn't have to worry about running a mine. We enjoyed the living-on-top-of-the-world feeling even more because of the contrasts with the anxieties, tensions, shortages, restrictions, and general run-down grubbiness of San Francisco and of most places in the "real world" in wartime. We found a rare tranquility in an uninhabited town which is only waiting.

Walkermine, as it turned out, was waiting to be dismantled and to be remembered only by nostalgia buffs.

Reminders of the mine in Portola include a number of houses that were purchased at auction and moved to north side lots; one of the houses was occupied by Dubby and Edith (Joy) Hardy and their infant daughter (now Diane Angel) when Edith was killed, apparently because of gases from a defective or inadequate heating system, in 1952. A smaller building, attached to a section of old army barracks, was the residence of Bud and Norma Janes when Bud, now an Appellate Court Justice, first began the practice of Law. Other converted Walkermine houses are now occupied by Nelda Whitenton and by Hank and Monica Sproul.

Walkermine as a going operation would be remembered by Vic Dods, a Western Pacific Railroad conductor in Portola, who worked at the mine for a time in the 1930's. The mine and miners should also be remembered by Edith Austin who, with her husband, the late Tom Austin, operated the Red Feather, and by Norma Peterson who played the piano there - and by Roy Mitts and Snap Applegate who tended bar and dealt twenty-one at the old HM&J Club, and by a number of other long-time residents of eastern Plumas County.

Marcile
Marcile Nielsen

Gil Luman Interview

Gil Luman worked at Walkermine during the years of 1928 and 1929. He was employed as mill hand (lumber), logger, and recreation aide.

The community of Walkermine was almost self-contained. It contained a saw mill, foundry, blacksmith shop, and machine shop. Groceries were shipped in via the tram way. The saw mill cut all of the mine logging, and lumber used in the structures, and the timbers used in the construction of the tram towers. Many of the parts, such as bearings, were manufactured in the foundry and machine shop. This was very necessary as the only mode of travel during some of the winter months was the tram.

Logging was done with a steam donkey; this method of logging was similar to the present day high lead method of logging. The logs were ground skidded by cable to a landing below the donkey. The logs were conveyed by truck and flume to the sawmill.

The mill was a 36" circular mill. Two 36" opposed vertical circular saws cut the lumber. (Indications are that some of the lumber was sold commercially.)

A man by the name of Ralph Gil was the donkey puncher (operator). He was Gil Luman's immediate supervisor when he was logging.

As a recreation aide Mr. Luman's immediate supervisor was Wayne Braden. He coordinated baseball games and other sporting events. Wayne Braden's father was the sheriff of Plumas County at that time. A sister of Wayne Braden, Evelyn Braden, resides in Quincy. She drives the taxi cab. Wayne Braden was killed at the Engel Mine. It was suspected that he was killed by his partner during an argument over finances.

An explosion occurred at the mine during the '30's that killed seven to nine men. An ore car loaded with the explosives hit either one side of the adit or the side of the tummel. Mr. Luman could recall the accident but it was not too clear as he was not working at the mine at that time. (Interview with Roy Harrison indicates that the car hit the adit. Mr. Harrison was called on to identify the bodies.)

At the time Mr. Luman worked there the village at Walkermine supported a hospital, a grade school, and high school. He did not remember when their construction took place. Prior to construction of the high school the high school students were boarded out, probably at Portola, to get their high school education.

All communities such as the one at Walkermine contained local colorful characters. One of them was Art Erickson, also known as The Flying Swede.

On one of the trips the Flying Swede got drunk and fell approximately 30 feet to the snow where he remained for a considerable length of time before he was found. Mr. Luman and two other men towed him out via snow shoes and tobaggan, about a four mile trek.

Mr. Luman stated that skilled labor was \$5.50 per day for a ten hour day. One dollar a month was retained to pay the compensation doctor who visited the camp once a month.

It was pointed out by Mr. Luman that both the Engle mine and the Walker mine produced enough gold to pay for their operation.

The miners worked under relatively safe conditions considering that during that era safety was not a major concern. Occasional cave-ins occurred, and the previously mentioned explosion that killed seven to nine men. The greatest concern was the mis-fires of explosive charges. A series of charges were set to go off almost simultaneously. Since black powder fuses and caps were used, one could count the explosions and determine whether all of the charges were exploded. Needless to say, misfires produced nervous disorders, frustration, and, in some instances, temporary insanity - that is, for the person or persons who had to locate and render harmless the unexploded charge. Overall, Walker mine retained a good safety record throughout its years of operation.

Frank and Johnny Sobrero worked at Walkermine. The Sobreros are still residents of Plumas County. The Sobreros had a baseball team in the family.

Midway House on Little Grizzly Creek and Willow Glen, near Portola, were the whore houses that were most used by the Walkermine male population. They were the primary source of illegal liquor. Many of the cafes had speakeasies in back where liquor was sold. Most of the illegal liquor was manufactured in Butterfly Valley.

Mr. Luman salvaged lumber from the structures at Walkermine.

INTERVIEW - LOUIS S. RICHARDS

Mr. Louis S. Richards lived at Walker Mine from 1921 to 1927. He was ten years old when he and his family moved away. His dad, Samuel Richards, was foreman in the blacksmith shop. He had previously been employed by the Ingersol Rand Corporation in Tonopah, Nevada.

Employees, in order to be employed, had to sign term contracts. If employees resigned or quit prior to completion of term, there were some consequences. One was that they had to furnish their own transportation out of Walker Mine.

Harry Murphy was the foreman of the Crusher Mill. He was an uncle of Louis S. Richards.

The blacksmith shop housed the foundry and machine shop. Iron and steel was shipped in in bar form. Most of the small and many of the large replacement parts were manufactured there.

The ore concentrates were hauled from a railroad siding at Spring Garden. From there it was shipped by train to the Anaconda Copper Company refinery near Salt Lake City, Utah for the final stage of refining.

Shoeing the draft horses that were used for skidding logs was one of the many duties of the blacksmith. While Samuel Richards was shoeing one of these horses, the horse bit him. Mr. Richards immediately punched the horse in the vicinity of the head and killed him.

The cabinet maker at Walker Mine was a lookout on Mt. Ingalls during the summer months.

The community of Walkermine was recreation minded. The community had a baseball team that played in most of the communities in Plumas County. A ski tow was constructed near the community. A tennis court was constructed from 4"x4"x4" wooden blocks. They were set in sand with the grain end up and the lines painted on. Children were not allowed on the court.

MIN 000011639

I lived in Walker Mine from 1931 until 1941

As I was very young when we moved to Walker Mine, there are naturally many things I can't remember, but the memories I do have are happy ones.

My parents, brothers and sister all thought the mine was a great place to live.

They had a school for grammar and high school students. The library was also in the same building.

The company owned houses were mostly small one or two bedrooms, kitchen, bathroom each with a small shed built on the back of each cabin for wood. Electricity was provided for each house but wood was used for heating and cooking purposes. It was a back breaking job in those days to get enough wood for the long, cold winters. There were at least 130 houses, four bunkhouses for the bachelors, grocery store, post office, ice cream parlor and a movie house which showed movies 3 times a week, a hospital, recreation hall. Also about 60 private homes. At one time at least 600 people were employed at the mine when it was in full operation. Walker Mine was ranked as a major copper producer in California.

Even though Walker Mine was such an isolated community you never felt the lack of anything since it could provide almost everything.

The tramway running from Spring Garden over the mountains to Walker was nine miles long, carried everything needed especially in the winter when the roads were blocked by the heavy snows. There was no way of getting out except by the tramway.

It was a wonderful place to live, as year around there was something to do for the children, sliding skiing, toboggoning in the winter, hiking, fishing in the summer. The company even built a small ski-lift for the residents.

So it was a sad day for me when the mine closed in the fall of 1941. When the pumps and other underground equipment were removed I knew it would be permanent. The company said the (sic) could no longer operate it profitably with the price of copper at 12 cents a lb.

/S/ Elaine Mills
Quincy, Calif.

MIN 000011640

November 20, 1974

2360 Recreation - Special Interests

Walker Mine Tramway

I lived at Walker Mine between 1921 and 1927. I was a young child at that time, but these are some of my recollections of Walker Mine.

Most of the people who lived and worked at Walker Mine were of an age that might be called young adults. As a result, the interests of the people were those things which this age group liked. During the summer months, there was always groups of adults playing out of doors, playing such games as run sheep run, baseball, etc. During winter, there was always groups skiing, sledding or having card parties in the community hall. Also there were motion pictures once a week and at Christmas time the school children put on an entertainment with a play and carols. The management of the mine provided gifts for all of the children in the camp. Many of the older children used Little Grisley Creek for swimming. They constructed a small dam on the creek above the tailings pond; this formed a small lake and provided a swimming area. There were many people who spent the evenings fishing in the many creeks in the area and in the fall there were many deer and bear taken by the hunters.

Some of the names of the people who were there at that time were Mr. Geisendorfer and Tunnell. They were the managers of the mine. Mr. S. Richards, Foreman of the shops. Mr. H. Murphy, Foreman of the mill. Mr. C. d'Arrieta was the Mine Engineer. Others were Mr. Studebaker, Mr. Cox, Mr. Smith, Mr. Burke, Mrs. Hanavan was the school teacher. There was only one school room and all grades were taught by one teacher. Those children of high school age were boarded in Quincy or some other city in the Sacramento Valley and attended school there.

There were many unmarried men in the camp and they lived in the bunk houses and were fed at a mess hall, although some of the women would take in boarders and provided homecooked meals. The company did not provide firewood or coal for the families so many of the summer evening hours were spent in gathering firewood for use during the winter.

Winter at Walker Mine was very rigorous. There was no road into Walker Mine so that all food, mail and freight had to be brought in over the tramway. Also anyone wishing to come into or out of the camp was forced to use the tramway.

The tramway was nine miles long, it ran in a straight line from Walker Mine to Spring Garden on the Western Pacific Railroad, which

MIN 000011643

at that time was the only way out of the area, as the Feather River Canyon Road had not been built yet. The tramway consisted of two sets of cables. The carrier cable was 1 1/4 inches in diameter and the moving cable was 3/4 inches in diameter. The cables were held off of the ground by a series of towers which were spaced in most places about one hundred to two hundred feet apart. The height of the carrier cable above ground was usually twenty to thirty feet above ground. It took three and 1/2 hours to go the nine miles. The buckets which carried the ore concentrate were spaced about 75 feet apart but when a passenger was carried the spacing between the ore bucket and the passenger car was one hundred and fifty feet. There were several canyons which the tramway crossed. The spans were up to 1/2 mile wide and the carrier cable was up to 1500 feet above the floor of the canyon. The passenger cars were constructed like a metal box 4 feet by 3 feet square with three side walls 1 foot high. The fourth side was a round bar. The passenger sat flat on the floor as there was no bench or seat. Passengers were only carried during daylight hours, even so it was a rigorous ride. You put on all the heavy clothing you could find and then wrapped up in a couple of blankets and still you were paralyzed with cold by the time you arrived at the mine or Sping Garden. Winter time closed in usually about the last of October and the road to Portola was closed until the last of April or middle of May. The snows in the area were always very heavy and deep, up to sixteen to twenty feet deep and in some places the buckets of the tramway dragged through the snow. The miners who worked at Walker signed contracts to work for certain lengths of time, usually one year. Those who became dissatisfied either had to ski out or take the tramway, either way was very hazardous. These people usually left at night. They would walk out of camp some distance, then climb one of the support towers and grab a ride on one of the ore buckets. This usually cost them their life because they were not familiar with the construction of the various support towers. When the tramway approached a large span such as across one of the canyons, there was a tower called a tension tower. The clearance through these towers was not the same as the others and the person who was riding the ore bucket was swept off and usually badly injured; he was dropped into the deep snow and usually lost his life. He may have not been missed for a day or so, so that no one started to look for him for several days. The company employed a group of people who were called tram riders. These people rode the tram every day and knew how to get through these tension towers. They were used to inspect the towers and cables. These people usually found the bodies of those who were knocked off the tram.

The drill steel used in the mine was brought in over the tram and some of the steel was very long and it would often hang up on drifts of snow or bushes and cause the carrier basket to be pulled off the cable. This would cause a shutdown and it would take up to two weeks to hike out to the area of the accident and get it repaired.

The company maintained a grocery store which was open only about three hours per day. It was also the post office, so that the time when it was open was usually the camp social hour.

At the time of our arrival at Walker Mine, my brother and I and two other children were the only children living there; by the time we left, there were about 75. Before the camp closed, there were even enough that Plumas County provided a high school for the camp.

The camp had a baseball team which played in a league consisting of teams in Portola, Greenville, Mohawk, Taylorsville and Loyaltan and Engle Mine. The games were played on Sunday and most of the camps families would form a caravan and go to the game and then have a picnic supper on the way home in one of the small meadows in Grizzley Valley. There was a farmer from the Sacramento Valley who used to bring a truck load of watermelons to the camp. The people usually bought him out and then everyone would have a hot dog and bean dinner at Lovejoys old farm with the watermelon as dessert. As in most cases when everyone had eaten their fill there was usually about half of the load of watermelon left and someone would grab a melon, break it open and wash someone else's face with it. This usually caused a free for all, with people being chased all over the valley. Someone would be thrown into the creek and then more, the women as well as men, and kids really had a good time at these picnics.

The company had a contract with a man who operated a saw mill at the camp. He supplied the mill and mine and also all the lumber used in the building of the homes at the camp.

When I first came to the camp, there was only three or four houses, one bunk house, a small hospital, the store and mess hall and a barn. The homes were built of wood and covered with tar paper. Later regular houses were constructed.

The camp was built in a natural saucer shaped valley. The mine and mill were constructed on the northwest side; the store, hospital, bunk houses, mess hall, sawmill and barns were northeast side and all the homes were on the southwest side. In the center was a large flat which was an old tailings pond from the mill. This was used as the baseball diamond and play area of the school. The tram house, offices, school and hall were constructed on the perimeter of the flat between the mine, mill and the homes. On the southeast was a long slope which was free of trees and was used by the people for skiing and tobogganing. Back of the saw mill and store was a long sloping meadow that was swampy in summer but was ideal for starting skiing. During the winter, the snow would accumulate up to 16 to 20 feet deep on the flat. As a result, there were trails across the flat to the store, the mine and mill and the tram house from the houses. These trails would be very narrow and have walls of snow

sometimes as high as 12 to 14 feet. Most of the houses were built up off of the ground. I remember that our house had 16 steps up to the front porch and during winter only one or two would be above the snow.

After I left Walker Mine, the road to Genesee was built.

There was extensive logging operations in the Big Grizzley Valley area. A railroad was built to haul logs from Big Grizzley Valley to a mill on the west side of the valley and to the big mill at Deleker near Portola.

During the time I lived there, there were several large forest fires in the area, some caused by the logging operations and some from summer lightning storms.

There was considerable wildlife in the area, notably deer, bear, mountain lion, marmots coyote, squirrels, chipmunks and various birds, robins, blue jays, sparrows, night hawks, eagles, chickadees and snow birds, orioles, and mountain canaries, grouse, quail and black birds.

Because I was rather young at the time I lived at Walker Mine, it is rather difficult remembering the names of all individuals who resided there at that time. In addition to those mentioned before, here are a few more: Mrs. S. Carter, a surveyor known to me as "Red" Neff, Mr. S. Burt and several of the Sobrero family of Plumas County. Mr. R. McCarthy was Foreman of the Machine Shop.

I hope the above recollections can be used by you. If needed, I could possibly draw some rough sketches of the tramway, towers and buckets. There is a possibility that at a later date I may be able to come up with some old photographs which could be copied and used by you.

I am retiring in May of 1975 and plan to be residing at Lake Almanor on a permanent basis after that time. Util then, I can be contacted at either 521 Laurel Ave., Apt. 3 Pinole, CA 94564 or through J.O. Richards of 830 East Mountain Ridge Rd., Lake Amanor Peninsula, CA 96137.

Sincerely yours,

LOUIS S. RICHARDS
521 Laurel Ave. Apt. 3
Pinole, CA 94564

Plumas County, California.

All of the following Patented and Unpatented Quartz Mining Claims, each approximately 1,500 feet by 600 feet in size, located in Unorganized Mining District, Plumas County, California, lying largely in Sections 30, 31 and 32, Township 25 North, Range 12 East and lots 2, 3 and 4 in Section 5, lot 1 in Section 6, and Section 8, Township 24 North, Range 12 East Mt. Diablo Meridian.

Unpatented Claims

Digger:

Located October 6, 1915.

Recorded October 18, 1915, in Volume 12, Page 47, Quartz Claims, and on December 9, 1915, in Volume 48, of Deeds, Page 76, Plumas County California Records.

Piute No. 1:

Located August 6, 1915.

Recorded August 23, 1915, in Volume 12, Page 11, Quartz Claims, and on December 9, 1915, in Volume 48, of Deeds, Page 75, Plumas County, California, Records.

Piute No. 2:

Located August 6, 1915.

Recorded August 23, 1915, in Volume 12, Page 12, Quartz Claims, and on December 9, 1915, in Volume 48, of Deeds, Page 75, Plumas County California, Records.

Piute No. 3:

Located August 6, 1915.

Recorded August 23, 1915, in Volume 12, Page 13, Quartz Claims, and on December 9, 1915, in Volume 48, of Deeds, Page 75, Plumas County, California, Records.

Pacific No. 1:

Located October 25, 1913.

Recorded November 10, 1913, in Volume 11, Page 85, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.

Pacific No. 2:

Located October 25, 1913.

Recorded November 10, 1913, in Volume 11, Page 85, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.

Pacific No. 3:

Located October 25, 1913.

Recorded November 10, 1913, in Volume 11, Page 86, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.

- Pacific No. 4: Located October 25, 1913.
Recorded November 10, 1913, in Volume 11, Page 87, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.
- Pacific No. 5: Located October 25, 1913.
Recorded November 10, 1913, in Volume 11, Page 87, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.
- Pacific No. 6: Located October 25, 1913.
Recorded November 10, 1913, in Volume 11, Page 88, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.
- Pacific No. 7: Located October 25, 1913.
Recorded November 10, 1913, in Volume 11, Page 89, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.
- Pacific No. 8: Located October 25, 1913.
Recorded November 10, 1913, in Volume 11, Page 89, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.
- Pacific No. 9: Located October 25, 1913.
Recorded November 10, 1913, in Volume 11, Page 90, Quartz Claims, and on October 19, 1914, in Volume 40, of Deeds, Page 332, Plumas County, California, Records.
- Pacific No. 10: Located October 25, 1913.
Recorded November 10, 1913, in Volume 11, Page 91, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.
- Panama No. 1: Located October 27, 1913.
Recorded November 10, 1913, in Volume 11, Page 81, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.
- Panama No. 2: Located October 27, 1913.
Recorded November 10, 1913, in Volume 11, Page 82, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.

Panama No. 3:

Located October 27, 1913.

Recorded November 10, 1913, in Volume 11, Page 83, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.

Panama No. 4:

Located October 27, 1913.

Recorded November 10, 1913, in Volume 11, Page 83, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.

Panama No. 5:

Located October 27, 1913.

Recorded November 10, 1913, in Volume 11, Page 84, Quartz Claims, and on October 19, 1914, in Volume 46, of Deeds, Page 332, Plumas County, California, Records.

Sioux:

Located October 10, 1909.

Recorded October 13, 1909, in Volume 9, Page 87, Quartz Claims, and on February 13, 1914, in Volume 45, of Deeds, Page 405, also on October 19, 1914 in Volume 46, of Deeds, Page 331, Plumas County, California, Records.

Standard:

Standard Extension:

Reliable:

Reliable Extension:

Proof of labor on above 4 claims recorded December 22, 1913, in Volume 4, Proofs of Labor, Page 56, and on January 13, 1915, in Volume 4, Proofs of Labor, Page 206, Plumas County, California, Records.

The following unpatented Claims were acquired at about the date set opposite each.

Washoe	October, 1915
Washoe No. 1	October, 1915
Washoe No. 2	October, 1915
Grizzly	April, 1918
Grizzly No. 1	April, 1918
Grizzly No. 2	April, 1918
Grizzly No. 3	April, 1918
Grizzly No. 4	April, 1918
Grizzly No. 5	April, 1918
Grizzly No. 6	April, 1918
Grizzly No. 7	April, 1918
Grizzly No. 8	April, 1918
Grizzly No. 9	April, 1918
Grizzly No. 10	April, 1918
Grizzly No. 11	April, 1918
Grizzly No. 12	April, 1918



Survey has been made of all unpatented claims, 40 in number, which survey has been forwarded to Surveyer General for approval.

When approval is secured, application for patent will be made.

Dolly Gulch Placer Claim:

Being the E $\frac{1}{2}$ of NE $\frac{1}{4}$ of Section 7, and W $\frac{1}{2}$ of NW $\frac{1}{4}$ of Section 8, Township 24N, Range 12E, Mt. Diablo Meridian.

Bullion Mill Site:

Located in E $\frac{1}{2}$ of NE $\frac{1}{4}$ of Section 7, Township 24N, Range 12E, Mt. Diablo Meridian, being part of Dolly Gulch Placer Claim.

March 1932 *Scott Turner*

MARCH, 1932

DEPARTMENT OF COMMERCE

UNITED STATES BUREAU OF MINES
SCOTT TURNER, DIRECTOR

INFORMATION CIRCULAR

MILLING METHODS AT THE CONCENTRATOR
OF THE WALKER MINING CO.,
WALKERMINE, CALIFORNIA



BY

M. R. MCKENZIE AND H. K. LANCASTER



I. C. 6555.
March, 1932.

INFORMATION CIRCULAR

DEPARTMENT OF COMMERCE - BUREAU OF MINES

MILLING METHODS AT THE CONCENTRATOR OF THE WALKER MINING CO., WALKERMINE, CALIF.¹

By M. R. McKenzie² and H. K. Lancaster³

INTRODUCTION

This paper describing the milling methods at the Walkermine concentrator, Plumas County, Calif., is one of a series being prepared by the United States Bureau of Mines on milling methods and costs in the various mining districts throughout the United States.

ACKNOWLEDGMENT

The authors wish to acknowledge their indebtedness to James O. Elton, manager of the International Smelting Co., and to Henry A. Geisendorfer, manager of the Walker Mining Co., for permission to present this paper; to H. A. Geisendorfer and J. D. Roberts, shift boss, for historical facts, and to D. D. MacLellan, geologist, for geological information.

LOCATION

The Walker mine and mill are located at Walkermine, Plumas County, in the northeastern part of California and at an elevation of 6,200 feet in the Sierra Nevada. Walkermine is about 27 miles northeast of Portola, a division point on the Western Pacific Railroad which is about 60 miles west of Reno, Nev.

Weather conditions and heavy snowfall usually make the road between Portola and Walkermine impassable during the winter and early spring months. During this period, transportation of passengers and supplies is conducted over an aerial tramway 9 miles long the terminal of which terminal is located at Spring Garden, Calif. Construction of this tramway, which was built chiefly for the shipment of concentrates, was completed in October, 1920.

GEOLOGY

The geology of the Walker mine deposit is described in detail by J. S. Diller in U. S. Geological Survey Bulletin 353, 1908, Geology of the Taylorsville Region, Calif.

In brief, the orebodies occur along a shear zone which cuts through a highly garnetiferous schist, known locally as the Robinson schist. The ore shoots, which are composed of chalcopyrite in quartz and silicified schist, are not connected and may be regarded as individual deposits. They range from 300 to 2,000 feet in length and from 5 to 100 feet in width.

1 The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used:
"Reprinted from U. S. Bureau of Mines Information Circular 6555."

2 One of the consulting engineers, U. S. Bureau of Mines, and mill superintendent, Walkermine concentrator.

3 One of the consulting engineers, U. S. Bureau of Mines, and assistant mill superintendent, Walkermine concentrator.

ORE TREATED

The Walker ore has complex mineralogical associations but may be classified as a gold and silver bearing chalcopyrite-magnetite-quartz ore. Recent examination of the ore by R. E. Head, chief microscopist of the United States Bureau of Mines, showed the approximate percentages of mineral constituents to be as follows:

	<u>Per cent</u>
Quartz	75.0
Garnet	5.0
Chlorite	2.5
Other nonopaque minerals	5.0
Metallic minerals	<u>12.5</u>
Total	100.0

The metallic minerals, which as stated amount to 12.5 per cent of the ore, are distributed as follows:

	<u>Per cent, by weight</u>
Magnetite	59.76
Pyrite	7.80
Pyrrhotite	1.94
Minor metallic gangue minerals	1.10
Total metallic gangue minerals	70.60
Chalcopyrite	24.17
Chalcocite	1.60
Minor copper bearing minerals	2.55
Noncopper-bearing minerals	1.08
Total metallic ore minerals	29.40
All metallic minerals	100.00

The ore is very resistant to crushing and fine grinding. During the spring months considerable difficulty is encountered in crushing operations due to the moisture content in the ore.

The tabulation which follows presents a chemical analysis of typical mill heads averaged for a 6-month period.

Typical analysis of mill heads

<u>Per cent</u>					<u>Ounces per ton</u>	
<u>Copper</u>	<u>Iron</u>	<u>Sulphur</u>	<u>Lime</u>	<u>Insoluble</u>	<u>Gold</u>	<u>Silver</u>
1.687	9.0	2.1	1.1	79.2	0.05	0.833

HISTORY

Milling operations began in June, 1916, with the completion of a 75-ton capacity pilot plant, which was erected at a distance of 4,700 feet from the shaft and at a much lower elevation. Transportation of the ore from the mine to the mill was accomplished by an aerial tramway.

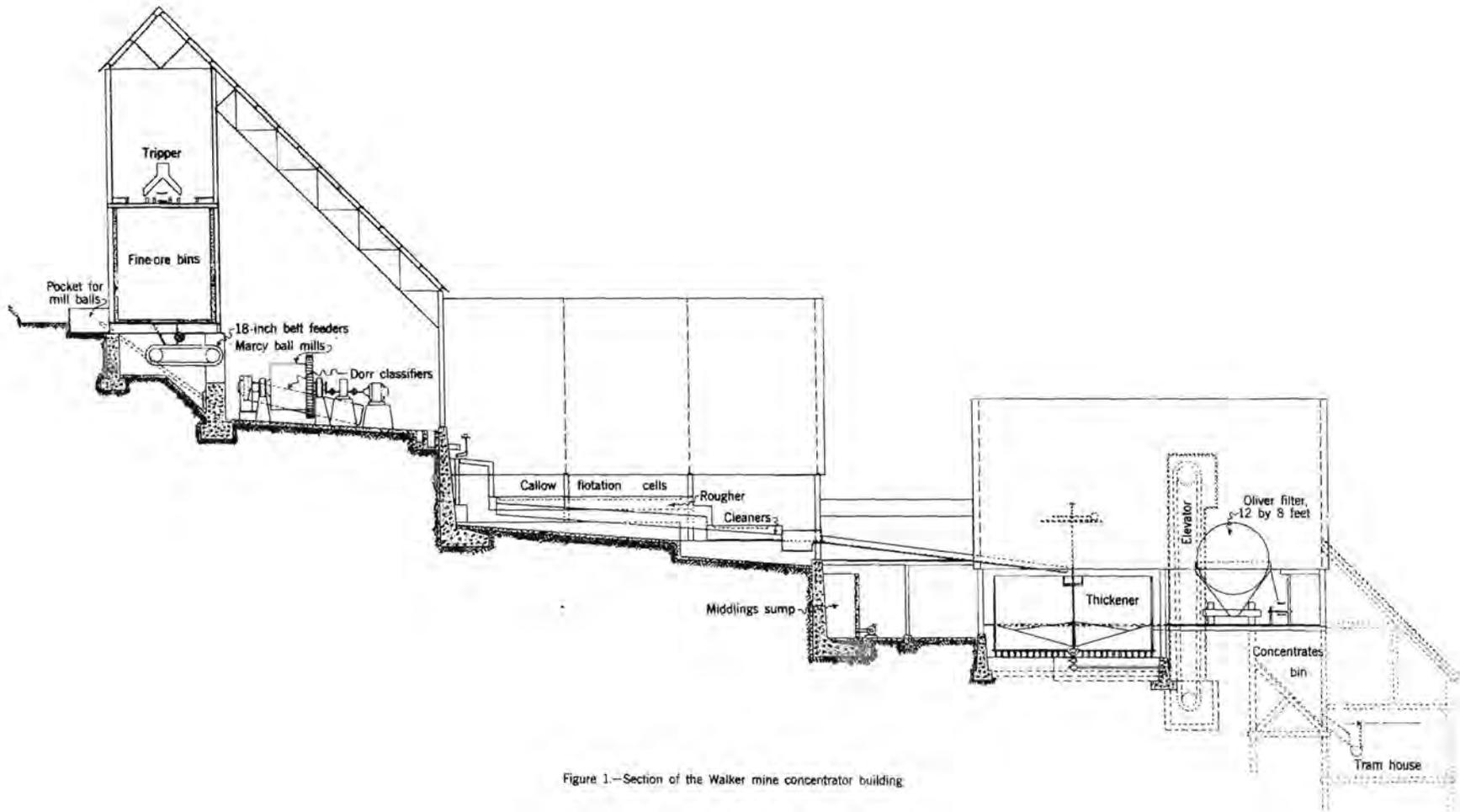


Figure 1.—Section of the Walker mine concentrator building

The treatment of ore in this pilot plant may be briefly summarized as follows:

(a) The mine ore was crushed to 2-inch size by Joshua Hendy crushers, one 12 by 24 inch and one 9 by 15 inch.

(b) The crusher product was ground to 4 per cent plus 48-mesh in two No. 64½ Marcy ball mills, each operated in closed circuit with a 4-foot 6-inch by 15-foot 9-inch Dorr classifier.

(c) The classifier overflow pulp, which contained 42 per cent of solids, was elevated a distance of about 60 feet to the flotation division, comprised entirely of sloping bottom Callow cells.

(d) The flotation concentrates were partially dewatered by two Callow cones, further thickened in a Dorr thickener and filtered by one 6 by 8 foot Oliver filter.

(e) The tailings were discharged into a canyon and no attempt was made to recover water except that contained in the concentrates thickener overflow.

Power was furnished locally by a steam plant of 350-hp. capacity until 1917 when electric power was made available by the completion of a power transmission line 14 miles long by the Great Western Power Co.

Reagents used in the pilot mill were lime, coal tar, and pine oil. Coal tar was replaced by thiocarbanilide in 1922.

During the operation of the pilot plant the International Smelting Co. acquired an interest in the property and, in addition to securing electrical power previously mentioned, drove a working tunnel 1 mile long for the purpose of developing the mine 1,000 feet vertically below the outcrop. This tunnel was also connected with the upper workings and since 1922 has served for transporting mine ore to the mill, the aerial tramway formerly used for this purpose being abandoned.

In 1922 the size of ball-mill feed was reduced from 2 inches to 1 inch by the installation of rolls. At this time the mill capacity was increased to about 300 tons of ore per day.

A larger mine production necessitated the building of a new mill of 750-ton capacity, which was completed and started to operate in December, 1923.

GENERAL DESCRIPTION OF PRESENT MILL

The present mill is built on a hillside a short distance from the portal of the main working tunnel. The location selected was well suited to standard mill construction and provided reasonable fall for gravity flow of pulp through the mill and down the valley to the tailings pond. The mill buildings are of steel and concrete with sides and roofs made of Anaconda corrugated zinc.

A typical longitudinal section of the concentrator building is presented in Figure 1.

The coarse and intermediate crushing plants are located in separate buildings at one side of the mill proper. The mill proper includes four sections. Each section is equipped with a Marcy ball mill which operates in closed circuit with a Dorr classifier; these are followed by rougher, cleaner, and scavenger Callow flotation units. A thickening and filtering unit handles the combined flotation concentrates from the four mill sections.

On account of the isolation of the mine and mill, it is necessary to maintain well-equipped machine, electrical, blacksmith, and carpenter shops. These shops can meet almost any emergency, which insures continuity of operations.

Capacity

The mill as first designed, with three No. 75 Marcy ball mills and three flotation sections, was operated for some time at the rate of 750 tons of ore per day. Grinding during

this period was maintained at 4 per cent plus 48-mesh size. The mill capacity was later increased to 1,200 tons per day by changing the degree of grinding previous to flotation treatment from 4 to 14 per cent plus 48-mesh size. It might be interesting to note that the small sacrifice in recovery entailed by coarser grinding was more than offset by the lower cost of milling which resulted from the larger tonnage treated.

In September, 1929, the capacity was further increased from 1,200 to 1,700 tons per day by the installation of a fourth mill section. This latter section is identical with the three original sections except that the grinding unit is larger and comprises a No. 77 Marcy ball mill followed by a suitable classifier; the larger grinding mill accounts for the additional 100-ton ore capacity of this section.

Water Supply

Fresh water is obtained from springs and from the mine. The spring-water supply amounts to approximately 100 gallons per minute but this water is only available for mill use after camp requirements are satisfied. Water is pumped from the mine at the rate of about 300 gallons per minute, and this source provides the chief new water supply for the mill. The only water reclaimed from milling operations is that from the concentrates dewatering division. This amounts to approximately 60 gallons per minute and is returned to the supply tank located above the mill, where it is mixed with the fresh water.

Power

The Pacific Gas and Electric Co. furnishes power to the mine and mill transformers from Caribou through its Vermont substation at 22,000 volts. Motors of 100 hp. or larger are operated at 2,200 volts and smaller motors at 440 volts. A 110-volt circuit is used for lighting.

PRESENT METHOD OF CONCENTRATING

A flow sheet of the crushing plant and concentrator with a legend which gives details of machines used is presented in Figure 2.

Coarse Crushing

Longitudinal sections of the coarse and intermediate crushing units are given in Figure 3.

Ore is hauled from the mine to the crushing plant during three shifts. Ore trains which comprise eleven $3\frac{1}{4}$ -ton capacity side dumping cars are drawn by 35-hp. Baldwin-Westinghouse electric locomotives. The ore is dumped onto a sloping steel rail grizzly having 11-inch spaces and after passing through the grizzly falls into a 1,500-ton capacity, cylindrical, steel receiving bin.

Ore is drawn from this bin by a motor-driven, 42-inch, Anaconda-type pan conveyor which discharges onto an inclined grizzly having $1\frac{1}{2}$ -inch spaces. The oversize is fed to a Traylor crusher set at $3\frac{1}{2}$ inches. The crusher is 15 by 24 inch size, is driven by belt from a 150-hp. motor and will handle 85 tons of material per hour.

The grizzly undersize drops directly onto an inclined 20-inch conveyor belt and provides a cushioning layer for the crusher product which drops onto the same belt. This belt is driven by a 15-hp. motor and delivers the ore to the intermediate crushing unit passing under an electromagnet enroute for the removal of tramp iron. A picker is stationed at this conveyor for the removal of wood.

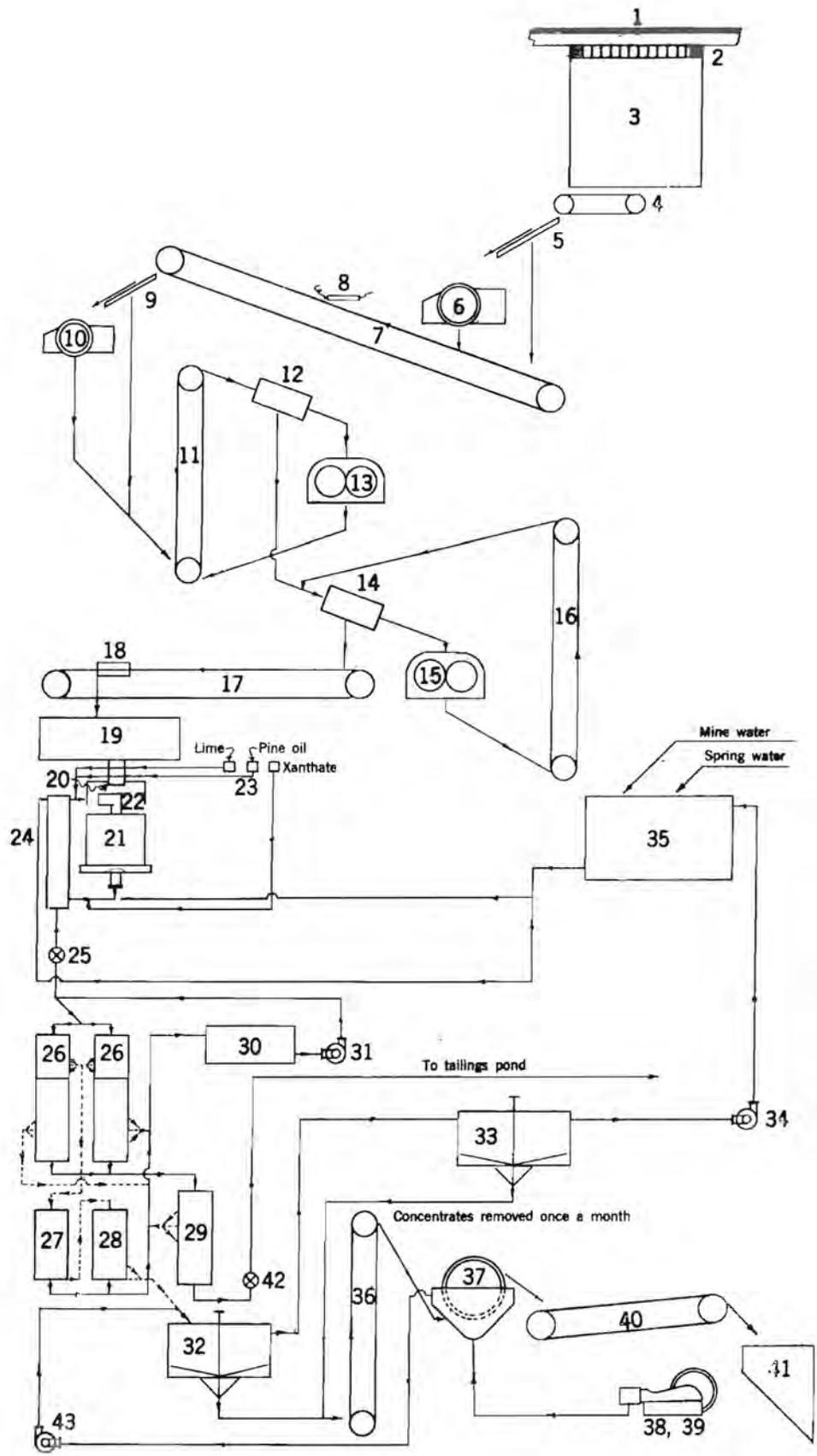


Figure 2.—Flow sheet of crushing plant and concentrator

Legend for flowsheet of crushing plant and concentrator

Number ¹	Description of machines
1	Track from mine.
2	One grizzly, 11-inch spaces.
3	Ore bin, 1,500-ton capacity.
4	One pan conveyor, 42-inch.
5	One grizzly, 1½-inch spaces.
6	One Traylor jaw crusher, 15 by 24 inch.
7	Belt conveyor, 20-inch.
8	Electromagnet.
9	One grizzly, 1½-inch spaces.
10	Two Anaconda jaw crushers, 8 by 20 inch.
11	One bucket elevator, 16-inch.
12	One trommel screen, 1½-inch holes.
13	One set Anaconda rolls, 24 by 55 inch, set at 1-inch.
14	Two trommel screens, 1-inch holes.
15	One set Anaconda rolls, 24 by 55 inch, set at ⅜ inch.
16	One bucket elevator, 16-inch.
17	One belt conveyor, 20-inch.
18	One tripper conveyor.
19	Fine-ore bin, 2,400-ton capacity.
20	Four feed conveyor belts, 18-inch.
21	Four Marcy ball mills, three No. 75 and one No. 77.
22	Four scoop boxes.
23	Reagent feeders.
24	Four Dorr duplex classifiers, three 6 feet by 18 feet 4 inches and one 6 feet by 23 feet 4 inches.
25	One Galigher sampler for heads.
26	Eight Callow rougher flotation machines, two 3-foot 11-pan units per mill section.
27	Four primary Callow cleaner machines, one 3-foot 4-pan unit per mill section.
28	Four secondary Callow cleaner machines, one 18-inch hoppers-type unit per mill section.
29	Two Callow scavenger machines, 3-foot 7-pan units.
30	One middlings sump, tank capacity 2,000 gallons.
31	Three Krogh pumps, 3-inch.
32	Two Dorr concentrates thickeners, 12 by 25 foot.
33	One Dorr thickener, 11 feet 4½ inches by 46 feet.
34	One centrifugal pump, 3-inch.
35	Water storage tank, capacity 100,000 gallons.
36	One bucket elevator, 16-inch.
37	One Oliver filter, 12 by 8 foot.
38	One Oliver vacuum pump, 14 by 8-inch.
39	One Oliver compressor, 9½ by 8 inch.
40	One belt conveyor, 18-inch.
41	Concentrates storage bin, 290-ton capacity.
42	One Galigher automatic sampler for tailings.
43	One centrifugal pump, 1½-inch.

1 Refer to numbers of Figure 2.

Intermediate Crushing

Ore from the coarse-crushing unit is delivered onto an inclined grizzly having $1\frac{1}{4}$ -inch spaces. The grizzly oversize is fed to two 8 by 20 inch Anaconda-type jaw crushers. The grizzly undersize joins the crushed material and the combined products are fed by a bucket elevator to one 40 by 72 inch trommel screen having $1\frac{3}{4}$ -inch diameter round holes. The elevator is driven by a 20-hp. motor and is equipped with buckets 16 by 8 inches in size. The trommel operates in closed circuit with a pair of 55 by 24 inch Anaconda rolls set with a 1-inch spacing; the rolls product returns to the elevator which feeds the trommel. The trommel undersize is distributed to two 40 by 72 inch trommels having 1-inch round holes. These trommels operate in closed circuit with one pair of 55 by 24 inch Anaconda rolls, set at $\frac{3}{8}$ inch, the rolls product being returned to the trommels by a 16-inch bucket elevator.

The trommel undersize product, minus 1-inch size, comprises the feed to the grinding units and is conveyed to the 2,400-ton capacity fine-ore bin by a 20-inch belt equipped with a tripper.

The coarse rolls are driven by a 100-hp. motor, the two Anaconda crushers and the fine rolls by a 150-hp. motor, and the three trommels by a 10-hp. motor.

Grinding and Classifying

As previously indicated the concentrator is divided into four units for grinding and flotation operations. The three original grinding units are each equipped with one No. 75 Marcy ball mill which operates in closed circuit with a Dorr duplex classifier 6 feet by 18 feet 4 inches in size. The fourth unit was, as previously mentioned added to increase the capacity of the original mill and is equipped with one No. 77 Marcy ball mill which operates in closed circuit with a Dorr Duplex classifier 6 feet by 23 feet 4 inches in size.

Each No. 75 Marcy mill is driven at a speed of 24 r.p.m. by a 200-hp., 900 r.p.m., induction motor through a Falk herringbone-gear speed reducer. The No. 77 mill is also driven at a speed of 24 r.p.m. by a 200-hp., 900 r.p.m., synchronous motor through a Westinghouse-Nuttall speed reducer.

Ball charges carried in the Nos. 75 and 77 mills weigh 9 and 13 tons, respectively, and are maintained by the daily addition of 4-inch forged steel balls. Ball consumption is 2.074 pounds per ton of ore ground.

Shell and feed end liners are of manganese steel, the shell liners being of the ship-lap type. Grate sections are of rolled chrome steel and have $\frac{1}{4}$ -inch openings. The tabulation which follows gives the life of liner parts and the consumption of liners per ton of ore ground.

Life of liner parts and consumption of liners per ton of ore ground

	Life of liner, hours	Liner consumption, pounds per ton of ore
Shell liners	3,200	0.273
Feed end liners	4,300	0.176
Grate bars	4,200	0.176
Total		0.563

The classifiers used with the No. 75 grinding mills are set at a slope of $3\frac{1}{2}$ inches to the foot and are operated at a speed of 27 strokes per minute by 5-hp. motors. The classifier which serves the No. 77 mill is set at a slope of 3 inches per foot and is operated at a speed of 25 strokes per minute by a 5-hp. motor.

Ore from the fine-ore bins is delivered to the center of each drum and scoop type ball-mill feeder by an 18-inch conveyor belt. Each No. 75 mill receives feed at the rate of $16\frac{2}{3}$ tons per hour and the No. 77 mill at the rate of $23\frac{1}{3}$ tons per hour. The grinding mills operate with an average circulating load of 145 per cent and with pulps containing from 77 to 78 per cent of solids.

The degree of grinding is maintained at 12 per cent plus 48-mesh; classifier overflow pulps contain from 46 to 50 per cent of solids.

Table 1, page 9 presents screen analyses of ball-mill feed and of intermediate and final grinding-circuit products.

Flotation

For simplicity of control and metallurgical accounting the classifier overflow pulps of the four grinding sections are combined, sampled and then distributed equally to four flotation units. The equipment of each flotation section comprises two 3-foot, 11-pan, standard Callow rougher machines, one 3-foot, 4-pan, standard primary Callow cleaner, and one 18-inch, hoppersed-type, secondary Callow cleaner.

The two rougher machines operate in parallel; rougher concentrates are removed from the first three pans and middlings froths from the remaining eight pans. The rougher concentrates, which have an average content of 15 per cent of copper, are cleaned in two stages, the final stage producing finished concentrates. The middlings froths of the rougher machines join the tailings of the two cleaner cells and flow by gravity to a common pump sump, and from there are returned to the head of the rougher cells by three 3-inch Krogh sand pumps, each of which is driven by a 15-hp. motor.

The tailings from the rougher cells of the four flotation sections are combined and distributed to two 3-foot, 7-pan, Callow scavenger units which produce middlings froths and final waste tailings. The middlings froths join the middlings of the rougher and cleaner units in the common sump and are returned to the heads of the roughers.

Cell blankets of 4-ply, quilted, 18-ounce canvas are used and have a life of from 60 to 90 days.

Air for flotation operations is furnished at 4.15 pounds per square inch pressure by two No. 6½ Roots blowers and one Connersville blower. The Roots blowers are each link-belt driven at a speed of 172 r.p.m. by a 150-hp. motor. The Connersville blower is also link-belt driven at a speed of 240 r.p.m. by a 75-hp. motor.

The reagents used in flotation comprise lime, potassium ethyl xanthate (Z-3), and steam-distilled pine oil. Sodium aerofloat was used for a short period, but recently its use has been discontinued.

Dry hydrated lime is fed to the ball mills from small hoppersed feeders at the rate of 1.2 to 1.6 pounds per ton of ore milled. These amounts produce a protective alkalinity of about 1.09 pounds of CaO per ton of mill water which is sufficient to insure the desired metallurgical results. Operators are required to make hourly titrations for protective alkalinity and to make immediately any changes in the rate of adding lime as indicated by these titrations.

Xanthate is added as a 25 per cent solution to the classifier overflow pulps by a scraper feeder at the rate of 0.18 pound per ton of ore treated.

Steam-distilled pine oil is added to the ball mills by a scraper feeder at the rate of 0.16 to 0.22 pound per ton of ore. A rather large amount of this reagent is necessary on account of the coarseness of the flotation feed and also due to the fact that flotation operations are conducted in a circuit which is essentially a fresh-water circuit.

DEWATERING AND HANDLING OF CONCENTRATES

The concentrates pulps which contain from 20 to 25 per cent of solids, flow by gravity to two 25 by 12 foot Dorr thickeners. The thickened pulps containing 75 per cent of solids are delivered to one 8 by 12 foot Oliver drum-type filter by a 16-inch bucket elevator. The filter is chain driven by a 3-hp. motor. The concentrates produced are handled by operating the filter on two of the three daily shifts, one operator being required on each shift.

A vacuum amounting to 22 inches of mercury is maintained at the filter by one 14 by 8 inch Oliver vacuum pump which is driven by belt from a 15-hp. motor. Blowing air is furnished at 5 pounds pressure by a 9½ by 8 inch Oliver compressor, driven by belt from a 15-hp. motor. The filtrate is handled by a 1½-inch centrifugal pump in place of the usual barometric leg. A filter cover gives approximately six months of service before replacement is necessary.

The overflows from the two Dorr thickeners are conveyed to a spare 45 by 12 foot thickener, where a small additional recovery of fine concentrates is made. These concentrates are allowed to accumulate and are dewatered in the filter about once each month.

The filter cake, which averages 1 to ½ inch in thickness and which contains from 8 to 10 per cent of moisture, is discharged onto a 14-inch conveyor belt and delivered by this belt to a 290-ton capacity storage bin. The concentrates are loaded from this storage bin into 800-pound capacity tramway buckets; the latter are trammed to Spring Garden where the concentrates are dumped into railroad cars for shipment to the Tooele plant of the International Smelting Co.

The tramway is of the double rope type and is 9 miles long. The loaded side is equipped with 1½-inch locked-coil track cable and the light side with 1-inch cable of the same construction. The buckets are equipped with automatic grips which engage a ¾-inch Lang Lay traction rope which is driven by a 50-hp. motor.

Labor employed on the tramway includes 1 foreman, 3 loaders, 3 unloaders, 2 line riders, and 1 agent, who is located at Spring Garden.

Since the completion of the aerial tramway in 1922, it has been an important factor in plant operation as it is the only means of transporting passengers, mine and mill supplies and camp provisions during the months of heavy snowfall.

DISPOSAL OF TAILINGS

The tailings of the scavenger flotation cells contain from 33 to 36 per cent of solids and are conveyed by a wooden launder for a distance of about ¾ mile to a large impounding pond. Proper precautions are taken to prevent tailings from entering near-by streams.

MILL SAMPLING

Samples of the heads as represented by the combined classifier overflow pulps, the concentrates, and the final tailings are taken during each shift by Galigher automatic samplers. The samples are dewatered in a small pressure filter and after being dried are split to convenient-size assay pulps.

An analysis for copper content is made on each shift sample for mill guidance and control. A composite sample is made from shift samples for metallurgical accounting. These composite samples are assayed for copper, gold, silver, and insoluble contents.

Cars of concentrates are sampled by pipe samplers at Spring Garden before being shipped to the smelter.

METALLURGICAL AND OPERATING DATA

Screen analyses of concentrator intermediate and final products are presented in Table 1. Table 2 gives chemical analyses of mill heads, final concentrates, and tailings; and Table 3 shows the percentage distributions of copper, silver, gold, iron, and insoluble in final concentrates and tailings. Metallurgical data for the period June to November, 1930, are presented in Table 4, and the distribution of labor is shown in Table 5.

Table 1.- Screen analyses of concentrates intermediate and final products

Screen size	Weight, per cent									
	No. 75 Marcy mill units				No. 77 Marcy mill unit			Flotation products		
	Ball-mill feed	Ball-mill discharge	Classifier sands	Classifier overflow	Ball-mill discharge	Classifier sands	Classifier overflow	Concentrates	Middlings	Tailings
Plus 1-inch	5.4	-	-	-	-	-	-	-	-	-
Plus ½-inch	41.3	-	1.4	-	-	0.9	-	-	-	-
Plus 4-mesh	23.0	2.6	8.1	-	1.2	4.7	-	-	-	-
Plus 8-mesh	9.5	4.7	8.5	-	2.5	6.0	-	-	-	-
Plus 30-mesh	9.0	30.0	43.5	2.5	23.8	46.5	2.2	-	-	3.2
Plus 48-mesh	1.8	14.0	14.8	11.2	14.3	15.4	10.5	4.8	3.0	15.7
Plus 65-mesh	2.9	8.1	6.4	22.4	11.4	8.4	14.6	6.8	1.5	5.5
Plus 100-mesh	0.5	6.8	3.3	2.5	7.0	3.3	6.2	18.1	4.5	13.8
Plus 150-mesh	2.4	6.0	3.8	15.5	10.5	4.2	9.0	14.5	4.4	10.0
Plus 200-mesh	2.9	6.1	3.7	2.3	6.5	3.3	12.2	6.8	6.0	10.7
Minus 200-mesh	1.3	21.7	6.5	43.6	22.8	7.3	45.3	49.0	80.6	41.1
Totals	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 2.- Chemical analyses of mill products, June to November, 1930

	Weight, per cent	Analyses				
		Copper, per cent	Silver, ounces per ton	Gold, ounces per ton	Insoluble, per cent	Iron, per cent
Heads	100.0	1.687	0.833	0.05	79.0	9.0
Concentrates	6.41	24.00	9.920	0.49	14.5	22.1
Tailings	93.59	0.163	0.200	0.02	83.5	8.1

Table 3.- Mill recoveries and losses, June to November, 1930

	Weight, per cent	Distributions, per cent				
		Copper	Silver	Gold	Insoluble	Iron
Concentrates	6.41	91.2	73.3	62.7	1.2	15.8
Tailings	93.59	8.8	23.7	37.3	98.8	84.2

Table 4.- Metallurgical data, June to November, 1930

Ore treated, total	tons	268,255
Days operated	number	169.67
Operating time per day	hours	24
Amount of ore treated per 24 hours, average	tons	1,580.62
Ore treated per man-shift per 24 hours, average	do	38.51
Sections operated, average	number	3.84
Ore treated per section per 24 hours, average:		
No. 75 Marcy mill units	tons	400
No. 77 Marcy mill unit	do	500
Concentrates produced, total	do	17,290.54
Copper produced, total	pounds	84,027,948
Concentrates produced per 24 hours, average	tons	101.90
Recoveries:		
Copper	per cent	91.21
Silver	do	76.32
Gold	do	62.73
Ratio of concentration	tons into 1	15.57
Pressure of flotation air, per square inch	pounds	4.15
Alkalinity of mill water, CaO per ton of water	do	1.09
Plus 48-mesh material in flotation tailings	per cent	11.10
Consumptions of water, reagents, and supplies per ton of ore milled:		
Net water used	gallons	325 to 350
Lime	pounds	1.40
Pine oil	do	0.321
Potassium ethyl xanthate (Z-3)	do	0.084
Sodium aerofloat (use discontinued)	do	0.075
Balls	do	2.074
Liners	do	0.563

Table 5.- Distribution of labor

	<u>Number per 24 hours</u>
<u>Mill superintendence:</u>	
Mill superintendent	1
Shift foremen	3
<u>Coarse and intermediate crushing departments:</u>	
Crusher operators	2
Crusher helpers	2
Rolls	2
Screens	2
Electromagnet	2
<u>Grinding and flotation departments:</u>	
Ball mills	3
Flotation operators	3
Flotation helpers	3
<u>Filter department:</u>	
Operators	2
<u>Repair and shop crews:</u>	
One repair foreman and 20 men	21

Distribution of electric power.

May, 1931

<u>Department</u>	<u>Kilowatt-hours</u>	<u>Per cent</u>
Primary crushing	42,804	7.22
Secondary crushing	42,804	7.23
Grinding	348,631	58.83
Flotation	149,765	25.27
Filtration	8,561	1.45
<u>Totals</u>	<u>592,565</u>	<u>100.00</u>

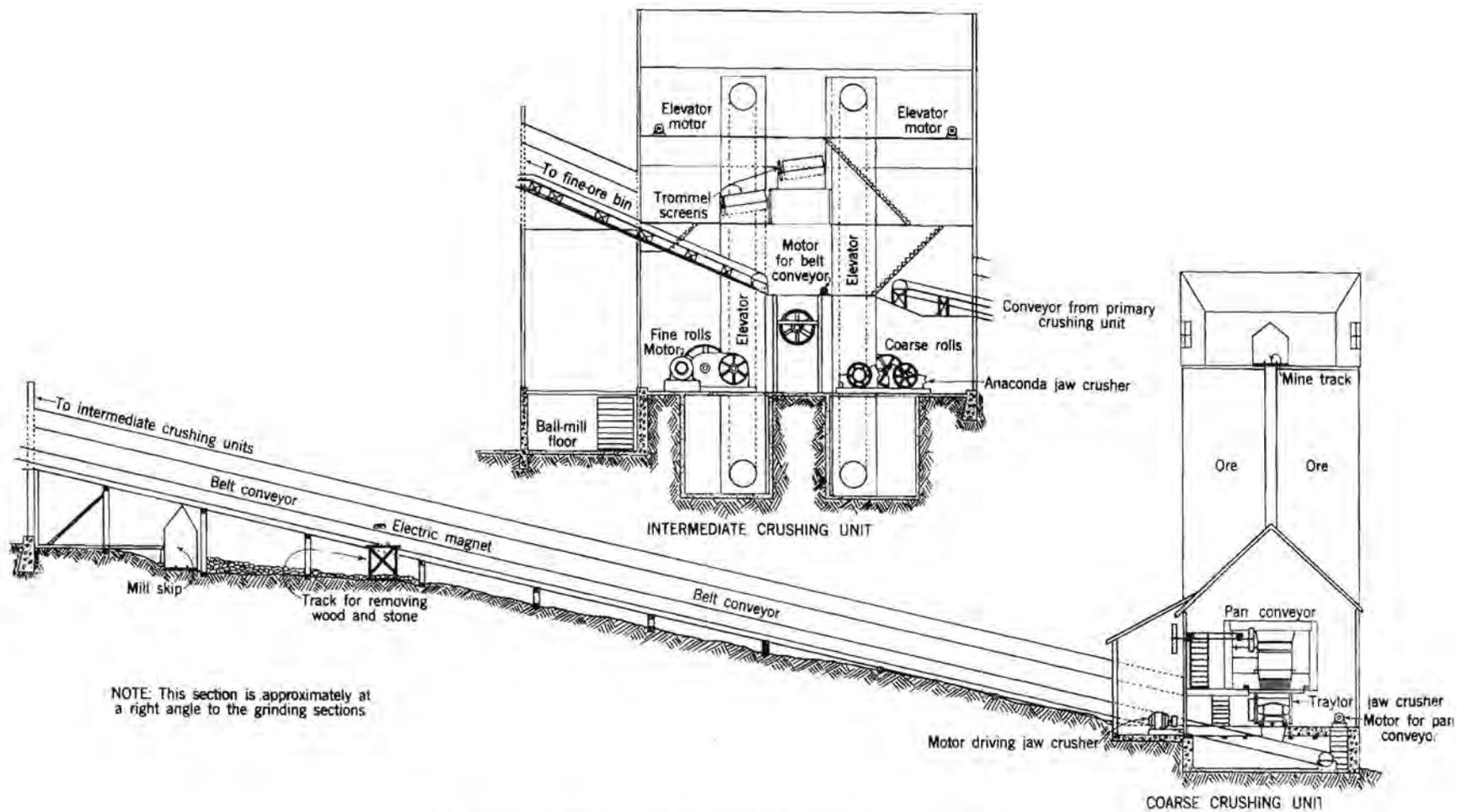


Figure 3—Longitudinal sections of the coarse and intermediate crushing units