LAW OFFICES
of
WELLMAN CLARK
711 HUTTON BLDG. - PHONE RI. 1195
SPOKANE 8, WASH.

February 8, 1951

Office of the Defense Production Authority
Washington, D. C.

Gentlemen:

There is enclosed herewith, four copies of an application for a production loan. Applicant, in submitting this information, has avoided making any statements which cannot be substantiated by either an examination of the books and records, or of the mine.

Applicant knows that there is a large tonnage of broken ore available almost immediately for mining and milling, but inasmuch as there has been no accurate sampling of this ore for tungsten content, applicant is not making any statement of ore reserves.

The ore position in the mine can be readily ascertained upon examination by geologists and engineers, and applicant is requesting particularly, that this mine be thoroughly examined by the U. S. Geological Service and by the Bureau of Mines. It may appear after this examination that applicant has been too conservative in estimates for capital necessary in order to produce tungsten in fairly substantial quantities.

If, after examination of the mine, this Authority requires engineering estimates of costs and improvements and for production, application will secure the same.

Sincerely yours,

Wellman Clark
Counsel

WAC:gc
enc.

Form NSRB-146
(Nov. 1950)

UNITED STATES GOVERNMENT

APPLICATION FOR GOVERNMENT LOAN
UNDER SEC. 302 OF
DEFENSE PRODUCTION ACT OF 1950

FORM APPROVED
BUDGET BUREAU NO. 25-R002

AMOUNT OF LOAN REQUESTED
$100,000.00

TERMS OF LOAN REQUESTED
Straight Loan
To be repaid from royalties

DATE OF APPLICATION
February 8, 1951

TO BE FILLED IN BY DELEGATE AGENCY

(DATE RECEIVED)

COMM.
AGRIC.
INT.
D.T.A.

FILE NO.

NAME AND ADDRESS OF APPLICANT (*Street, City, Zone, State*)

ACE GOLD MINES, INC.
613 Prospect Avenue
P. O. Box 368
Lewiston, Idaho

INSTRUCTIONS

Application should be filed with the Department of Commerce, Department of Agriculture, Department of Interior, or the Defense Transport Administration, whichever has the primary interest in the facilities, products, or processes involved. However, for convenience of the applicant, he may file with any government agency with which he has contract or other pertinent relationships and such agency will arrange for the transmittal of the application to the appropriate office.

Submit four (4) signed copies of the application. Name and address of applicant should be stamped or typed for identification of each sheet of the application and all accompanying papers. When a question is inapplicable, this should be so stated on the form. Additional sheets may be attached in answering any questions or in providing other supporting information.

1. PURPOSE OF LOAN

Give a brief general statement of the purpose of the loan requested, including in the table below estimated amounts for such major purposes as land acquisition, building construction, purchase of plant, purchase of equipment, working capital, repayment of debt, etc. Statement should make clear whether funds will be used for expansion of capacity, development of technological processes, or production of essential materials.

General Statement

Purchase and installation of additional mine and mill machinery and equipment to permit applicant to recover tungsten values present in the mine. A portion of the loan will be used for mine rehabilitation, road improvement and expansion of camp facilities.

NATURE OF EXPENDITURE	AMOUNT
Purchase and installation of additional milling machinery	$25,800.00
Purchase of transportation equipment (truck and pickup)	7,200.00
Mill improvements and changes	10,000.00
Camp construction and improvement	10,000.00
Mine rehabilitation (primarily upper levels)	10,000.00
Current liabilities	14,525.38
Supplies and working capital	22,474.62
Total amount applied for	$100,000.00

2. **PROPOSED METHOD FOR REPAYMENT OF LOAN**

State sources of funds, and proposed schedule of repayment

Loan to be repaid by applying ten (10) per cent of the net return from all ores sold.

3. **NATURE OF BUSINESS AND DESCRIPTION OF PROJECT**

Describe fully the business activity for which the funds are intended. In so doing, identify the materials and services to be produced, describe the facilities and processes involved, and explain in detail any research activity and the nature of the results expected. Attach blueprints and specifications, if available, and furnish other technical details to the extent that they are not covered elsewhere in the application.

See page 13 attached hereto.

4. **Relationship to National Defense.** Explain carefully how the expenditure of the funds will contribute to national defense. As a part of such explanation, the following questions should be answered to the extent possible:

(a) What evidence exists as to current shortages of the materials or services to be produced?

The demand for tungsten is in excess of the supply.

(b) What evidence exists as to future shortages of the materials or services to be produced?

The demand will increase as defense effort is stepped up.

(c) Are such shortages, if any, regional or national in scope?

National.

(d) In what respects will the use of the funds aid directly in expediting the carrying out of government defense contracts? (A listing of defense contracts, if any, held by applicant is required in item 8 below.)

None.

4. Relationship to National Defense - Continued

(e) In what respects will the use of the funds aid indirectly in expediting the carrying out of government defense contracts or related operations?

None

(f) Are there available alternative methods or facilities to accomplish the same purpose as that for which these funds are intended? (For instance, unused capacity, possibility of multiple shift operations, idle facilities, readily convertible equipment, sub-contracting?) If answer is yes, explain why alternatives are not used.

Applicant's present mill cannot make tungsten recoveries. Additional equipment is necessary.

5. Maximum Designed Production

List separately materials or services identified in item 3 (a)	Unit of measure (b)	Maximum designed production with existing facilities (c)	Average percentage of maximum designed production used in quarter preceding filing of application (d)	Maximum designed production including use of funds applied for (e)
Production of 50 tons				
of ore per day would				
give the following				
monthly amounts:				
tungsten	Unit	None	None	750
gold	ounces	5	None	450
(A unit of tungsten is 20 pounds)				

6. Employment

(a) Number currently employed at location(s) where funds are to be used. (Use pay period ending nearest 15th of month preceding filing of application.)

None

(b) Maximum feasible employment with existing facilities.

(1) Single shift operation.

20

(2) Multiple shift operation (specify how many shifts).

24 men when mill runs three shifts of 8 hours each.

(c) Estimated additional employees required by the use of the funds applied for.

24

7. Timing

(a) On what date(s) are the requested funds needed?

Equipment will be ordered as soon as funds are made available.

(b) On what expected date(s) will applicant begin to use such funds and obtain output from the use of such funds? Wherever possible, give planned schedule of output.

Additional equipment should be installed and in place 45 days after funds are available.

Production of tungsten should commence within the next thirty day period.

8. Output from the use of funds applied for will be for the following purposes:
a. For the following principal prime defense contracts (if any) with the United States Government:

Date of contract (a)	Contracting Government Agency (b)	Program symbol (2 digits) or other contract identification (c)	Materials or services (d)	Delivery date(s) (e)	Amount *(Dollars)* (f)
	None				

b. For the following subcontracts (if any) with U.S. Government prime defense contractors:

Date of contract (a)	Materials or services (b)	Supplied to *(Give name and address of firm)* (c)	Delivery date(s) (d)	(e) Government agency receiving end product or services (f) Program symbol (2 digits) or other contract identification	Amount *(Dollars)* (g)
	None			(e) (f)	
				(e) (f)	
				(e) (f)	

c. For the following classes or types of customers not covered by contracts listed above (list materials or services to be provided and, wherever possible, also indicate final product use):

None

9. **Feasibility**

(a) Estimate anticipated requirements for manpower, equipment, raw materials, energy, fuel, transportation facilities, water supply, housing, community facilities, and other factors of production, for (1) preparation of the facilities and (2) actual operation thereof. (The estimates may be limited to those factors of substantial significance to the preparation and operation of the facilities for which the funds are intended.)

Applicant believes that adequate man power will be available in the mine area. There is no present shortage of raw material, fuel, or water. Additional housing facilities will have to be erected. This can be done while mill reconstruction and mine development are under way.

The additional transportation equipment will be adequate for camp needs.

(b) Discuss and evaluate the availability of each of the above factors in the area(s) where the funds will be used.

Applicant plans to erect only camp buildings. For community and recreational facilities workers will go to Golden, Idaho, approximately seven miles from the mine. Sufficient timber is available for construction.

10. The following applications for necessity certificates for tax amortization (Under Section 124A of the Internal Revenue Code) for facilities at the location(s) covered by this application have been filed since January 1, 1950.

Date of application (a)	Government file number (b)	(Estimated) Total of facilities in dollars on each application (c)	(d) If final action has been taken, give date of	
			Issuance	Denial
	None			

11. **Recent Efforts to Obtain Credit**

(a) Banks— List names and addresses of all Banks of Deposit of Applicant within the last 5 years: *(Mark with an asterisk (*) bank or banks in which deposits are now kept)*

Idaho First National Bank, Lewiston, Idaho.*

11. **Recent Efforts to Obtain Credit** - Continued

(b) State efforts to obtain credit, within 60 days preceding date of application, from banks, the Reconstruction Finance Corporation, or other sources, results, and reasons if refused. (NOTE.— Section 302 of the Defense Production Act of 1950 states that a loan may be extended "only to the extent that it is not otherwise available on reasonable terms." Accordingly, Applicant should show that it has applied to each bank named in (a) above, or explain the reason for not doing so. The fact that a loan of the particular maturity and terms applied for is refused by a bank or banks is not sufficient to comply with the statute, if credit on reasonable terms is available. State whether a bank will participate in the loan, and if so, state name of bank and amount of participation. Full particulars must be given.) List the names and addresses of banks and other lending institutions to which applications for credit have been made, and in each case state date of application, amount of credit available, if any, maximum term for which credit is available, what consideration, if any, was given to possible guarantee of loan under Federal Reserve Regulation V, and reason for refusal or reason loan was not obtained. Indicate whether or not application was definitely refused for further credit on any basis.

Applicant made application for loans from:

Idaho First National Bank at Lewiston, Idaho, and
First Security Bank of Lewiston, Idaho.

Loans were refused for the reason that these lending institutions do not make loans of this character.

12. What other forms of government financial assistance, if any, have been received or requested by the applicant in connection with the purposes of the loan herein applied for? If applicant plans to request such assistance in the future, give details.

None

13. **HISTORY, MANAGEMENT, LEASED AGREEMENTS, INSURANCE, ETC.** See page 15.

These subjects should be fully covered in statements attached hereto. Outline past management experience or other basis for showing competence of the Applicant to perform in accordance with expressed purpose of the application. If plant was purchased, state price, form and terms of payment, date of purchase, from whom and under what circumstances purchase was made. If it is proposed to construct or acquire new facilities (including equipment), state estimated cost and basis of such estimate, form and terms of payment, and from whom purchases of facilities will be made. State whether Applicant, or the business or plant, has been in receivership, bankruptcy, Chapter X, XI or XII, in hands of creditors, committee, or whether Applicant has effected a compromise with creditors, and if so, discuss fully. Indicate whether business is conducted in leased premises and whether any facilities are leased from others and describe terms of any lease agreements. List type and amount of insurance carried on plant property. Describe briefly any pending or threatened litigation affecting Applicant.

14. NAMES AND ADDRESSES OF OFFICERS, DIRECTORS, OR PARTNERS, AND IN ADDITION THERETO, THE FIVE LARGEST STOCKHOLDERS IF A CORPORATION.

NAME AND ADDRESS (a)	Official title (If officer is also director indicate by "D") (b)	Total of annual salary, commissions, bonuses, etc., received from Applicant and affiliates during last fiscal year (c)	Estimated net worth outside of Applicant (d)	Number of shares held in applicant: Common (e)	Number of shares held in applicant: Preferred (f)	Life insurance carried for benefit of Applicant: Amount (g)	Life insurance carried for benefit of Applicant: Net cash surrender value after loans (h)
Bernard J. Nigg	President D	None	20,000.00	52,836	-	None	
John Nanninga	Vice-Pres D	None	5,000.00	4,000	-	None	
F. C. Funke	Sec-Treas D	1,800.00	5,000.00	58,152	-	None	
B. M. Kelsch	Director	None	30,000.00	20,000	-	None	
Levi Rossebo	Director	None	20,000.00	10,000	-	None	
For addresses and names of large shareholders, see Page 16.							
	Total	1,800.00	x x x x x			x x x	x x x

15. CAPITAL STOCK ISSUES

For Corporate Applicants

Item	Authorized (a)	Outstanding (b)	Par value (c)	Number of shares outstanding (d)	Dividend rate last paid (e)
Common stock	$500,000.00	$186,050.00	$ 25 cents	744,200	None
Preferred stock	$ None	$	$		

16. PURCHASE AND SALES RELATIONS WITH OTHERS

Does Applicant buy from, sell to, or use the services of, any concern or partnership in which an officer, director, large stockholder, or partner of the Applicant has a substantial interest? If not, so state. If so, give names of such officers, directors, stockholders, and partners, and names of such concerns or partnerships.

No

Does any officer, director, large stockholder, or partner of Applicant receive any commission, bonus, or other payment in cash or services from any concern or partnership with which Applicant has business dealings? If not, so state. If so, give names of such officers, directors, stockholders, or partners and amounts of such commissions, bonuses, or payments.

No

17. COMPENSATION SCHEDULE

INSTRUCTIONS: The schedule shall show the amount of compensation being paid to all employees of Applicant receiving compensation at a rate in excess of $10,000 per annum, including employees paid on a part-time basis where the rate of compensation exceeds $10,000 per annum computed on a full-time basis. If Applicant is a corporation, the schedule should show the compensation, regardless of amount, being paid to all officers, directors, and such stockholders as have an interest in Applicant's business of 10 percent or more. If Applicant is a partnership, the schedule should show the compensation being paid to, or being withdrawn by, all partners for their personal use. If Applicant is an individual, the schedule should show the amount being withdrawn by Applicant for his personal use. In each case the listed person's connection with the business should be indicated (i.e., whether an officer, director, stockholder, partner, owner, etc.). The calendar basis for the compensation should likewise be shown. Attorneys or firms of attorneys on a regular retainer or salary basis should be included. The schedule should include a separate notation indicating the source and amount of any compensation being paid by a company or firm directly or indirectly controlling, affiliated with, or controlled by, Applicant. If the space provided herein is insufficient, the schedule should be continued on the reverse side or appropriate continuation sheets should be attached.

17. **COMPENSATION SCHEDULE** - Continued

The term "compensation", as used herein and such schedule, shall include all salaries, fees, bonuses, commissions, retainers, regular drawing accounts, and other payments, direct or indirect, in money or otherwise, for personal services.

Name (a)	Position (b)	Compensation paid during previous fiscal year (c)	Present compensation (d)
F. C. Funke	Secretary-Treasurer	$1,800.00	$300.00/month

18. **COLLATERAL**

(a) The applicant offers the following described collateral as security for repayment of the loan applied for.

Description (a)	Date acquired (b)	Cost (c)	Book Value (Net) (d)	Appraised* value (e)
Property now held: None				
To be acquired: Chattel mortgage on all equipment and machinery purchased through proceeds of loan.				

* This column need be filled in only if a recent appraisal has been made. If so, identify appraiser below.

Name (a)	Title (b)	Date (c)
None		

(b) Describe existing liens, if any, on property listed above.

None

EXHIBIT A - CURRENT FINANCIAL STATEMENT

As of December 31, 1950
(Date not more than 30 days prior to date of application)

ASSETS

CURRENT ASSETS			
1. Cash			$ 4.65
2. Notes receivable		$	
Less reserve for doubtful notes			
3. Accounts receivable:			
Current	$		
Past due not over 4 months			
Past due over 4 months		$	
Less reserve for doubtful accounts			
4. Inventories:			
Raw materials	$		
Work in process			
Finished goods		$	
Less reserve for inventory losses			
5. Other current assets (describe) Prepaid insurance			75.00
TOTAL CURRENT ASSETS			$ 79.65
FIXED AND OTHER ASSETS			
6. Plant used in business:			
Land. Mining property	$ 239,804.25		
Buildings	6,104.16		
7. Machinery	42,627.97		
8. Equipment, furniture, and fixtures	37.04	$ 288,573.42	
Less reserve for depreciation			288,573.42
9. Investments—stocks and bonds			
10. Investments in affiliated companies			
11. Receivables due from affiliated companies			
12. Real estate not used in business			
13. Due from officers, directors, employees, stockholders			
14. Deferred charges			
15. Other assets			
TOTAL ASSETS			$ 288,653.07

LIABILITIES

CURRENT LIABILITIES			
16. Notes payable (see schedule 1, page 10):			
Banks		$ 1,000.00	
Trade creditors			
Officers, stockholders, relatives			
Insurance companies			$ 1,000.00
17. Accounts payable			4,358.83
18. Other current liabilities:			
Delinquent taxes ~~Real estate~~ Personal property		$ 25.25	
Delinquent taxes Federal			
Wages and salaries		3,116.70	
Due officers		1,935.58	
Accrued interest, rent, taxes, wages, etc			
			5,077.53
TOTAL CURRENT LIABILITIES			$ 10,436.36
FIXED AND OTHER LIABILITIES			
19. Machinery liens Conditional sales contracts			4,349.96
20. Mortgage debts (see schedule 2, page 10)			
21. Bonds or debentures (see schedule 2, page 10)			
22. Other liabilities Balance on purchase contract of mine			92,500.00
NET WORTH			
23. Common stock (if Applicant is incorporated) authorized		$ 500,000.00	
24. Preferred stock (if Applicant is incorporated) unissued		318,633.25	
25. Surplus (if Applicant is incorporated) Capital stock outstanding			181,366.75
26. Capital and Surplus Account (if Applicant is partnership or individual)			
TOTAL LIABILITIES			$ 288,653.07
27. Contingent liabilities (explain)			$

NOTE.— Submit copy of last available audit or of financial statement at close of last fiscal period (if such date differs from date of above statement).

SCHEDULE I - Notes Payable (in detail)

Name and address	Maturity	Amount	State amount and character of collateral	Name of guarantor(s) and/or endorser(s)
First Security Bank at Grangeville, Idaho	June 1, 1951	1,000.00		B. M. and L. M. Kelsch B. J. Niggs R. L. Garlinghouse

SCHEDULE 2 - Mortgage Debt (real estate and/or chattels) or Bond Issue

Names and addresses of holders	Date of maturity	Interest rate	Unpaid principal amount	Date to which interest is paid
			$	
Roy Beloit	4/8/52	6%	1906.60	April 8, 1950
Galen Burghardt	Royalty	5%	2000.00	October 14, 1947
Lew Refrigerator Co.	Past due	6%	93.50	July 1, 1950
Union Iron Works of Spokane, Washington	11/10/49	6%	349.86	February 3, 1950
TOTAL	XXXXXXX	XXXXXX	$4349.96	XXXXXXXXXXXXXXXXX

If mortgage secures a bond issue, state whether bonds are principally held by management and/or stockholders or by others, and attach copy of mortgage indenture.

EXHIBIT B - CONDENSED COMPARATIVE STATEMENT OF INCOME AND EXPENSES

For years ended December 31, 1950
(Insert date of end of fiscal year)

(000.00 omitted)

	(Figures for 3 preceding years)			Current year as of date of Exhibit A
	1947	1948	1949	
1. Net sales	-	-	-	-
2. Cost of goods sold				
3. Gross profit on sales (line 1 minus line 2)				
4. Other income (itemize)				
5. Total (line 3 plus line 4)				
6. Salaries (officers or partners)*				
7. Selling and all other expenses				
8. Total of lines 6 and 7				
9. Profit or loss before depreciation and Federal taxes (line 5 minus line 8)				
10. Depreciation				
11. Federal Income and Excess Profits Taxes				
12. Net profit or loss (line 9 minus lines 10 and 11)				
ANALYSIS OF SURPLUS				
13. Total surplus at beginning of period	-	-	-	-
14. Net profit or loss for period				
15. Line 13 plus line 14 if profit; line 13 minus line 14 if loss				
Add:				
16. Surplus paid in during period				
17. Surplus resulting from revaluation of assets				
18. Other additions to surplus (itemize)				
19. Total of lines 15 to 18, inclusive				
Deduct:				
20. Dividends				
21. Other charges to surplus (itemize)				
22. Total of lines 20 and 21				
23. Surplus at end of period (line 19 less line 22), MUST AGREE WITH SURPLUS AS SHOWN IN BALANCE SHEETS	-	-	-	-

* To include all payments of any kind (commissions, bonuses, withdrawals) to officers or partners.

NOTE—If years included in the above tables are not adequately representative of applicant's financial experience, information may be submitted for additional years.

Form NSRB-146 (Nov. 1950) | Name and address ACE GOLD MINES, INC., Lewiston, Idaho |

EXHIBIT C - CONDENSED COMPARATIVE STATEMENT OF CONDITION

For years ended December 31, 1950
(Insert date of end of fiscal year)

(000.00 omitted. Use figures to nearest thousand. For instance, the figure $3,489.36 should be written as 3; the figure $3,689.36 should be written as 4)

ASSETS	(Figures for 3 preceding years) 1947	1948	1949	Current year as of date of Exhibit A
CURRENT ASSETS:				
1. Cash	2	-	-	-
2. Receivables (after deducting reserves)				
3. Inventories				
4. Other current assets:				
TOTAL CURRENT ASSETS	2	-	-	-
FIXED AND OTHER ASSETS:				
5. Plant accounts (before depreciation):				
Machinery, equipment, etc.	39	39	41	43
Delivery equipment				
Real estate and buildings used in business	6	6	6	6
6. Other assets (as investments, real estate not used in business, etc.):				
Mining property	185	216	227	240
TOTAL ASSETS	232	261	274	289
LIABILITIES				
CURRENT LIABILITIES:				
8. Notes payable	2	4	3	3
9. Accounts payable	-	-	-	5
10. Accrued liabilities	5	1	2	5
11. Other current liabilities:				
Contracts payable	3	1	1	2
TOTAL CURRENT LIABILITIES	10	6	6	15
FIXED AND OTHER LIABILITIES:				
12. Mortgage debts				
13. Debentures				
14. Other fixed liabilities:				
Purchase contract on mine	99	98	95	93
RESERVES:				
15. Reserve for depreciation				
16. Other reserves:				
NET WORTH:				
17. Common stock (issued) (if Applicant is incorporated)	123	157	173	181
18. Preferred stock (issued) (if Applicant is incorporated)				
19. Surplus (if Applicant is incorporated)				
20. Capital and surplus account (if Applicant is partnership or individual)				
TOTAL LIABILITIES	232	261	274	289

NOTE— If years included in the above table are not adequately representative of applicant's financial experience, condition statements may be submitted for additional years.

EXHIBIT D

AGREEMENT AS TO COMPENSATION FOR SERVICES RENDERED OR TO BE RENDERED TO APPLICANT IN CONNECTION WITH APPLICATION AND/OR LOAN

To induce the United States Government and its agencies to make a loan under Sec. 302 of the Defense Production Act of 1950 to ACE GOLD MINES, INC. (hereinafter called "Applicant") and in consideration of the making of a loan to Applicant, the undersigned, having been retained by Applicant for the purpose of rendering professional or other services in connection with its application for a loan or loans, hereby represents, warrants, and agrees that the undersigned has not been paid, has not made any agreement with the Applicant to be paid, and has not procured any person to pay or agree to pay, and will not, directly or indirectly, charge or receive any bonus, fee, or commission in any form in connection with the said application for, or the obtaining of, the loan applied for by the Applicant, or any compensation in any form for services rendered or to be rendered in connection therewith except for the services and in the amounts stated below:

Name	Description of services	Amount paid	Amount to be paid
Wellman Clark	Legal services in preparation and presenting of application	$ None	$ 2,500.00

To induce the making of the loan and the employment of the undersigned by Applicant, the undersigned hereby further warrants, covenants and agrees, upon the consideration herein specified, and in consideration of the employment of the undersigned by Applicant, as above recited, that if the amount of compensation stated above for any such services shall not be deemed reasonable by any agency of the United States Government, the undersigned will reduce the charge for such services to such amount as shall be deemed reasonable by such agency, and will not, directly or indirectly, charge or collect from the Applicant or any other person, any sum in excess of the amount so deemed reasonable; and that if the undersigned has heretofore collected, from the Applicant or any other person, as compensation for any such services, any amount deemed by such agency to be unreasonable, the undersigned will refund to Applicant or such other person such sums as are in excess of the amount deemed reasonable. The undersigned further warrants, covenants and agrees that if the amount of the compensation for any such services is not determinable at the date of application, or is not stated above, it will not collect or charge any sum as compensation for such services without the prior written approval of the Government agency with which this application is officially filed as to the nature of the services for which such compensation is to be paid and the amount of such compensation.

Wellman Clark

Witness: Margaret Craig

Address of witness: 1724 W. Mallon, Spokane Wn.

Dated February 8, 1951

NOTE—Corporations must execute foregoing certificate in corporate name, by duly authorized officer, and seal must be affixed and duly attested; partnerships must execute in firm name, together with signature of a general partner. If no compensation is paid or to be paid for services rendered in connection with application or loan, this should be so stated and the Applicant should sign this Exhibit.

CERTIFICATION

The Applicant hereby certifies that the statements made in the foregoing application, and all exhibits and documents submitted in connection therewith, are true and correct statements to the best of Applicant's information and belief and are submitted as a basis for credit. The Applicant agrees to reimburse any agency of the United States Government upon demand for any expenses incurred in connection with or arising out of this application or any loan made pursuant hereto.

Dated February 8, 1951

Witness: (For individual applicants)

(Signature)

Witness: (For partnership applicants)

(Full name of firm)

By _____, a general partner.
(Signature)

(For corporate applicants)

(CORPORATE SEAL)

ACE GOLD MINES, INC.
(Full corporate name of Applicant)

Attest: _____ (Signature) Secretary (Title)

By Ben J. Rigg (Signature) President (Title)

The United States Criminal Code, 18 U.S.C., Sec. 1001, makes it a criminal offense to make a willfully false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE: 1950 O - 916171

3. Nature of Business and Description of Project.

The mining property of applicant consists of five (5) full claims and a fraction, located as the Shamrocks No. 1, 2, 3, 4, 5, and 6, title being held by location only. The mine is known locally as the Shamrock, or New York Mine, and is situated in the Ten Mile Mining District of Idaho County, Idaho, four and one-half miles in a northerly direction from Fall Creek, a small settlement on the South Fork of the Clearwater River, approximately 25 miles east of the town of Grangeville, Idaho. The state highway from Grangeville to Elk City passes through Fall Creek, and is an all-season road ordinarily kept in good condition. The claims are in sections 24, Township 29 N., Range 7 E.B.M. From Fall Creek to the mine there is fair access road, excellent for trucks and which can be negotiated at least in second gear by passenger cars. This road would have to be kept free of snow by the company to as far as Fall Creek in order to have year-round road transportation to the mine. The nearest railroad is at Grangeville, Idaho.

The mine is developed by a series of adits and mining of tungsten ore will take place by means of adits and stopes. Applicant does not consider at this time, sinking any shafts or winzes.

The vein structure has been developed by 11 adits over a total distance along the vein of about 500 feet. Stoping has been done from the lowest level, or No. 1, on up to successive levels to No. 11 at the top.

Past mining has been for gold only, even though samples taken from time to time, from the mine, indicated presence of tungsten running as high as 6.4 per cent WO_3.

There is enclosed, with the original copy of this application, copy of a report by L. Lore Wartes, which report will give accurate maps showing the location of the property, the development work accomplished, and a great deal of factual data concerning this mine. (Applicant did not know at the time of the employment of Mr. L. Lore Wartes that he was considered by the mining profession as unreliable.) Some of the conclusions drawn by Mr. Wartes apparently are not sustained by the factual data, and applicant does not desire to be bound by these conclusions. The Wartes report does, however, incorporate reports by J. S. Crandall and other engineers and metallurgists, all of which applicant believes to be extremely reliable and necessary in order that a fair picture of the property be presented.

3. Nature of Business and Description of Project. (Continued)

The geology of the deposit has been covered in the report of Mr. Crandall, from which it will be noted that very little work has been done on establishing the existence of the tungsten ore body in this mine. The mine has been visited by Mr. John M. Tabor, who viewed the premises on October 20, 1950, for the U. S. Bureau of Mines.

Additional work will have to be performed by applicant in order to establish tonnage of tungsten ore. Hence, applicant cannot at this time, make any statement regarding ore reserves or possible addition to ore reserves.

Applicant has at the mine, the following mining machinery and equipment:

1 - 152 cfm compressor
1 - 210 Worthington portable compressor
1 - 40 h.p. gasoline engine
2 - Ingersoll Rand stoper and Chicago Pneumatic stoper
1 - jackhammer
approximately 3000 feet of mine rails
2 - ore cars
approximately 200 Timken detachable bits
miscellaneous tools and equipment

Applicant has been operating a small mill on the premises, designed only to recover the gold content of the ore. The milling equipment on hand consists of the following:

1 - 50 ton ball mill
1 - jig, Denver Duplex 12x18" Double Compartment
1 - Dorr classifier
1 - 56 x 48" silverplated amalgamating plate
1 - 24" Denver equipment unit float cell
2 - Wilfley tables
1 - Blake type crusher
1 - 110 h.p. Imperial Diesel engine, together with a 100 K.W. electric generator
2 - transformers
1 - 50 h.p. motor
1 - Pelton water wheel
1000 ft. hydraulic pipe, together with miscellaneous belting and milling machinery and equipment.
1 - Blacksmith shop completely equipped.

One of the primary purposes of this loan is to revise the mill in order to handle the tungsten recovery. In this connection, a flow sheet must be prepared which would be adequate to handle up to 50 tons per day production. Existing flow sheets utilize existing equipment and do not carry detail for increased tonnage.

13. History, Management, Leased Agreements, Insurance, Etc.

Ace Gold Mines, Inc. is an Idaho corporation, and was incorporated in 1946. In 1948 Ace Gold Mines, Inc. received from White Mines, Incorporated, all assets of the White Mines, Incorporated, including particularly, a contract for the purpose of the Shamrocks Nos. 1, 2, 3, 4, 5, and 6, unpatented lode mining claims.

The purchase price of this property was $100,000.00, payable out of production with 10 per cent of the net return on all sales applying on the sale price. The contract further provided for minimum annual payments of $1,000.00 each. These payments have been made and the present unpaid balance is $92,500.00.

Applicant's mine was examined by Mr. Lorrain who was accompanied by Mr. Mahalivitch, both of the Bureau of Mines, in December of 1943. In this examination they used a mineral lamp, and commenced in the lower adit, or No. 1 tunnel, following up the stope between No. 1 and No. 2 levels on the ore vein which is approximately 4 to 4½ feet wide. The distance between these two levels is approximately 90 feet, and sheelite was traced continuously in the ore vein for this distance.

Near the upper part of the stope, close to the No. 2 level there appeared an exceptionally rich streak of sheelite on the hanging wall, and Mr. Lorrain advised Mr. Felix Funke to ship ore from this place to the Metals Reservce Corporation at Salt Lake City. This was done, and the report from the Metals Reserve Corporation is incorporated in Mr. Wartes' engineering report.

Mr. Lorrain and Mr. Mahalivitch continued examining the ore showings on the No. 2 level and found that sheelite was prevalent. They then continued in a stope from the No. 2 to the No. 3 level, and in this stope another unusually rich showing of sheelite was disclosed. From this area Mr. Lorrain took several samples and later reported to Mr. Funke that a sample taken over a width of approximately 3½ feet assayed as follows: 1.72 per cent WO_3 and .72 oz. Au.

In the spring of 1944 Mr. L. E. Shafer, an engineer from Mr. Lorrain's staff, visited the mine and took 180 pounds of ore from the dump of the No. 1 adit which he subsequently shipped to the Metal Reserves Corporation at Salt Lake City for the purpose of preparation of a flow sheet, a copy of which is in the Wartes report.

Except for the sampling undertaken by the Bureau of Mines, insofar as applicant knows, there have been no thorough sampling of this mine for sheelite, Mr. Wartes being apparently solely concerned with evaluating the mine for its gold content.

13. History, Management, Leased Agreements, Insurance, Etc. (Continued)

No officer of applicant is an experienced mining man. Applicant will employ competent mining and/or metallurgical engineers who will be responsible for the rebuilding of the existing facilities, and for the mine and mill operation.

Neither applicant, nor the mine has been in receivership, bankruptcy, or in any way involved with creditors committees, or in compromise with creditors.

No insurance is carried by applicant at present. Mill and camp will be insured if funds are available, and the lending agent will be a beneficiary under the policy.

There is no pending or threatened litigation.

14. Names and Addresses of Officers, Directors, or Partners, and in Addition thereto, the Five Largest Stockholders if a corporation.

Name and Address

Bernard J. Nigg
508 Main Street
Lewiston, Idaho

John Nanninga
Main Street
Lewiston, Idaho

F. C. Funke
613 Prospect Street
Lewiston, Idaho

B. M. Kelsch
Grangeville
Idaho

Levi Rossebo
Genessee
Idaho

The five largest stockholders are as follows:

Name and Address	Compensation	Net Worth	Shares Held	Life Ins.
Ernest Butler Myrtle Idaho	None	$30,000	128,136	None
Carl B. Funke 1414 5th St. Lewiston, Idaho	$1,000	11,500	58,152	None
F. C. Funke	See Item 14, page 7.			
Bernard J. Nigg	See Item 14, page 7.			
B. M. Kelsch	See Item 14, page 7.			

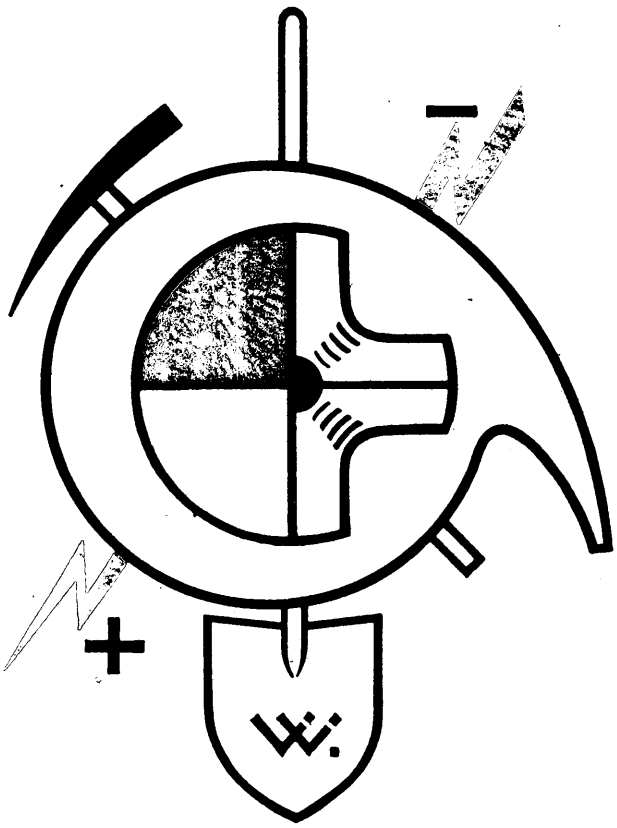


TABLE OF CONTENTS

Report by L. Lore Wartes

Maps

Report by J. S. Crandall

Photomicrographs of Samples

Random Sampling

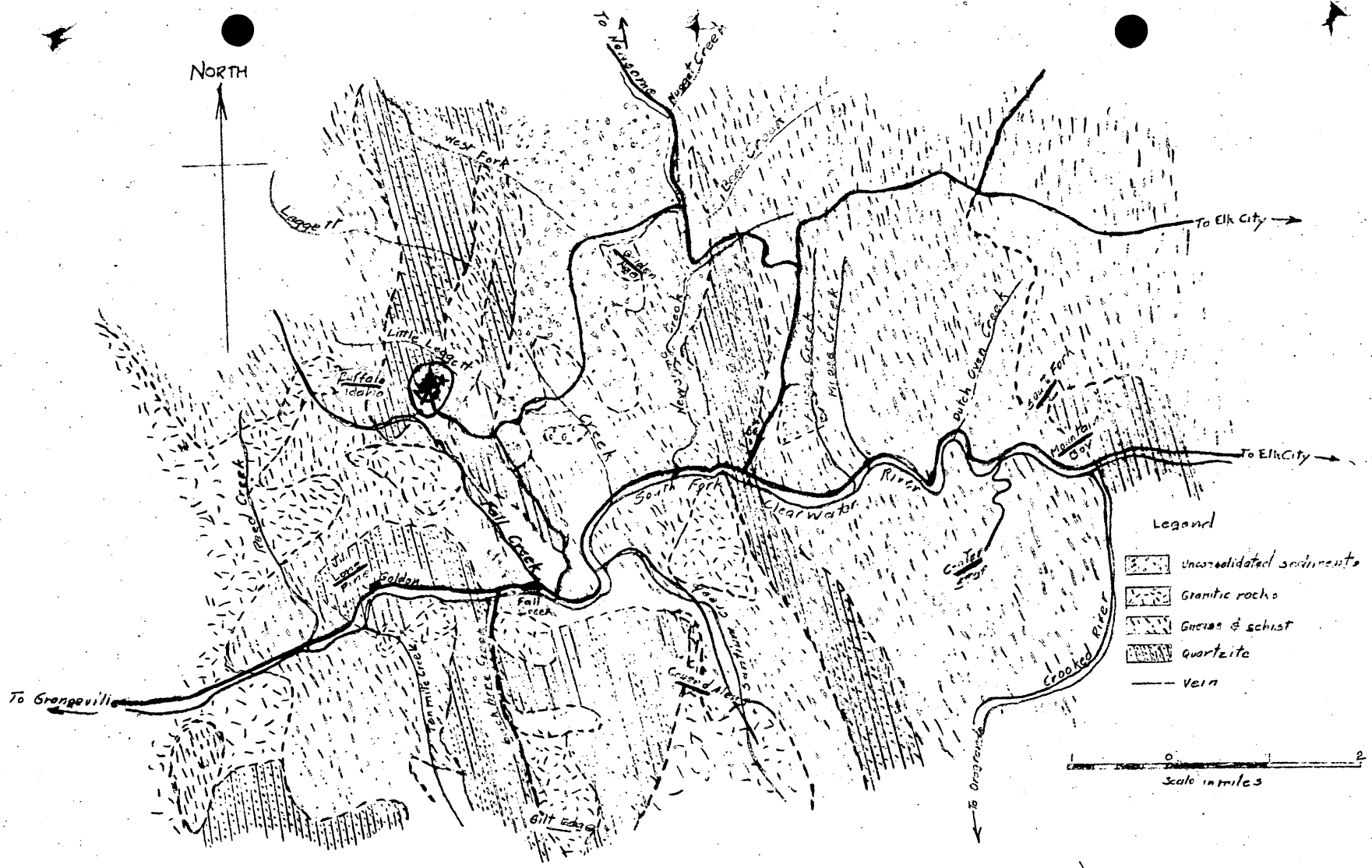
Tabulation of Sampling

Smelter Returns

U. S. Mint Returns

Report-Letter by H. G. Poole

Report by A. G. Kirby



Geological sketch, Golden District (after Shenon & Reed)

R E P O R T

on

THE ACE GOLD MINE
Golden, Idaho

Examination and Report by
L. Lore Wartes

Supplemental Reports by
J. S. Crandall, Mining Engineer
A. G. Kirby, Mining Engineer

April 6 to May 18, 1946

L. LORE WARTES
MINERAL EXPLORATION AND RESEARCH
900 W. SEVENTH AVE.
SPOKANE 9, WASHINGTON

GOLDEN, IDAHO
GRAND COULEE, WASH.

May 17, 1946

Mr. Felix Funke
1702 - Eighth Avenue
Lewiston, Idaho

Dear Mr. Funke:

In accordance with your request, I have examined your Ace Mine located above Fall Creek in Idaho County, Idaho, and present herewith my conclusions, recommendations, and summary. You will also find the report of John S. Crandall, mining engineer, covering his survey and detailed sampling made at my request.

Appended to the above are mine reports by S. H. Lorain, U. S. Bureau of Mines, and Alfred G. Kirby, mining engineer; and metallurgical reports of H. G. Poole.

Respectfully submitted,

L. Lore Wartes

L. Lore Wartes

LLW:hh

CONCLUSION

1. The Ace Mine contains 16,000 tons of proven ore with a gross value approximating $120,000.00.

2. There is, in a developed portion of the mine, probable and possible ore based on sampling and mill tests which amount to 15,000 additional tons of ore with a gross estimated value of $225,000.00.

3. Tungsten concentrates can be produced in conjunction with gold and silver recoveries. On the basis of work done to date, it is impossible to evaluate the values to be obtained from this source; but the indicated gross value of the tungsten content in the developed portion of the mine exceeds $100,000.00.

4. Ninety-five per cent of the gold and silver content of the ore can be recovered, although the past reported production of $394,000.00 was made with a recovery of less than 65 per cent.

5. Seventy per cent of the tungsten can be recovered.

6. Only one ore shoot has been developed in the mine to date. The downward extension of this ore body can be expected as the best showing in the mine is on the lowest, or No. 1 level. It would not be unreasonable to predict that this shoot would continue down a minimum of 800 feet. This alone would increase the ore reserves 100 per cent in the mine. There is no known reason to assume that it will cut off or radically diminish in value within the claim limits.

7. The present development of the Shamrock Vein is sufficient to predict the finding of other productive ore shoots on the vein's continuation to the north.

8. The Ontario Vein is larger, exposed over a greater length, and presents a better surface showing than the Shamrock Vein. Only exploration can place a proper valuation on it. Potentially it holds greater promise than the Shamrock Vein ever has.

9. The Ace Mine has been productive and reasonably profitable in spite of haphazard mining, poor equipment, and inexperienced management.

It has always been a shoe string operation so inadequately financed that the program of operation was always one of expediency. It developed like "Topsy grew" and provided a living for those who worked it.

10. Good management with a backlog of capital to assure a logical plan of development should put the Ace Mine into profitable production.

Completion of the development program here outlined and recommended should at best show the existence of a large mine justifying the construction of a 300 ton or larger, modern mill. The net return from such an operation should not be less than $250,000.00 a year.

At worst, fifteen or twenty thousand tons of additional ore should be developed which, with the positive and probable

ore already developed, should assure the return of the recommended capital investment with as much interest as could be expected from any gilt edged investment.

11. The gold and silver values coupled with tungsten give the mine the possibility of two sources of revenue. This operation has the hope of making profits from commodity production in good times, and from gold in times of depression.

I N D E X

Introduction

Summary

Geology and Mineralization

Production

Metallurgy

Recommendations

Program of Operation and Budget

INTRODUCTION

Like most of the mines in this area, the Ace Mine is difficult to appraise. Samples cut at random in what is apparently good ore run low or very high, the values ranging from very low to spectacular. Thirty-four samples taken informally over a period of years in what appeared to be high grade ore average $129.00 per ton, and range in value from $0.70 to $984.99. On a separate sheet in this report will be found a statement of random and grab sampling. Following this will be found the record of formal sampling.

Formal sampling in channels across the exposed vein at regular intervals is disappointing for two reasons:

1. The mineralization is most irregular throughout the ore shoot and, in most cases, it is quite apparent that the sample is not in good ore.

2. The mine has been consistently high graded and the ore removed wherever convenient or high grade.

Considering these two factors, it is to be concluded that the results of the sampling is as good as can be expected.

Over a period of ten years, the writer has examined most of the mines in this area. Each ore body showed great irregularity of values. Values recovered from ore random sampled by average operators invariably underran the sampling; whereas, formal sampling by careful operators underran recoveries

by 40 per cent. This is easily explained by the following case, an examination of the South Fork Mine during 1939 and 1940 in this area.

Sampling showed consistently low values in a large section of ore blocked out by good practical miners before World War I. A few samples ranging from $60.00 to $300.00 per ton were discarded as being unreliable or not representative of the ore. The writer finally cut twenty tonnage samples from a block of 5,000 tons of ore. The mill heads were sampled once a minute in a mill grinding 2½ tons per hour. Assay heads ran $5.50 per ton; actual recovery was $8.80 per ton; and tailings were $0.70. On the basis of the formal sampling, the South Fork Mine should have been turned down; yet, the South Fork contains $400,000.00 worth of blocked out ore on which a substantial net profit could be anticipated. It is interesting to note that a modern 125 ton mill is now under construction at the South Fork Mine, and the writer is consulting engineer for the Mineral Exploration and Research Corporation of Yakima, operators of this property.

SUMMARY

The history, location, accessibility, and topography is adequately covered by Mr. Crandall's report and supplemented by that of Mr. Kirby.

The mine was known as the New York up to 1935 when its name was changed to the Shamrock by Mr. Harvey White. Mr. Felix Funke became interested in the property in 1940 and renamed it the Ace Mine.

The writer made a reconnaissance of this area in 1934, making a preliminary examination at that time of the Ace property. Twice during Mr. Harvey White's operation the writer went over the development, watching it over a period of twelve years with considerable interest.

The present examination started April 6, 1946 and continued through April 28, 1946. Mr. Crandall and Mr. Fred Licht completed their work under my direction on April 26.

GEOLOGY AND MINERALIZATION

Areas in a Batholith roof or shell and near domes or cupolas are the best possible zones for prospecting and mineralization. Most of the world's profitable ore bodies are located near and related to Granite Batholith.

The Shamrock and Ontario Veins are ideally located. Geologically, their chance of being productive is excellent. As the gold is associated with arsenopyrite, the ore bodies can be expected to be deep seated primary ore which should continue to depths which would make economic mining impossible. Bonanza values should drop off as the mine is developed downward, but with better distribution of values.

Secondary enrichment and leaching have contributed to the irregularity of values in the developed part of the mine.

Scheelite (Calcium Tungstate) is an accessory mineral throughout the mine. Some samples show enough tungsten to be considered commercial ore without other value.

During the war, the U. S. Bureau of Mines' engineer recommended the shipping of ore for its tungsten content alone, although the ore from this area in the mine had shown an actual recovery of over $25.00 per ton in gold.

PRODUCTION

The unofficial production of the Ace Mine is reported to be $394,000.00 in gold and silver. No factual support can be obtained to substantiate this figure; however, actual mint returns and smelter receipts from 1934 to 1937 show a recovery of $62,997.97 from 2,396.58 tons of ore, showing a net value of $25.975 per ton.

The character of the ore, milling methods used, and actual records indicate an average recovery not exceeding 65 per cent of the value. It would be reasonable to expect to recover at least 20 per cent more in gold and silver with modern milling equipment. Recovery during the period from 1934 to 1937 should have been $75,000.00.

This accounts for only three years out of thirty-six from the mine's discovery, and gives some credence to the unofficial production reports.

There has been some intermittent production since 1937. Mint returns from Harvey White, operating sporadically, show a net return of $3,747.80 from the mint since 1937. Mr. White also shipped 12 tons of crude ore during this period which are covered by smelter returns, photostats of which are included herewith. These shipments ran $55.27, $67.13, and $110.13 per ton.

Sixty tons of ore, running 1½ ounces, was shipped to the Miller Mine and custom milled. Heads averaged $52.00 per ton and the gross value approximated $3,000.00. During this period the mine was operated intermittently on contract by Emigh and Wickstrom. Records of their work are not available.

METALLURGY

While the ore is complex and the recovery of values in the past has been poor, mill testing indicates that good recoveries can and should be made. A study of all the assay sheets covering mill operations in the past show the following:

	Heads	Tails
May 29, 1935	8.40	2.80
Aug. 21, 1935	12.60	7.00
July 30, 1936	22.98	7.00
Aug. 29, 1936	---	4.90
June 5, 1940	12.92	6.02
June 5, 1940	---	2.80
Aug. 8, 1941	---	6.65
Dec. 2, 1941	7.42	1.12
Jan. 3, 1942	52.35	31.92

Mill tests made under the direction of Mr. Kirby are covered in a report which is appended to this report.

A resume of his findings are as follows:

Using stamp mill, amalgamation, and corduroy, forty-eight tons of ore was milled from No. 1 level, and should be representative of the downward extension of the ore in the mine. The heads averaged $15.40.

		Per Cent
Gross value was	739.20	100.0
Bullion recovered	242.62	32.5
Concentrate recovered	194.53	26.3
Tailing loss	302.05	40.9

Another test was made with the same equipment. Thirty-eight tons of by-passed ore in place was milled with thirteen tons of backfill from the same area. The heads averaged $5.60 per ton.

		Per Cent
Gross value was	285.60	100.0
Bullion recovered	81.55	28.6
Concentrate recovered	128.10	43.8
Tailing loss	75.95	26.6

This last test should be representative of the pillars, by-passed ore, and backfill gob in mine.

The Government's need for such strategic ores as scheelite during the war, and because it was uneconomic to operate the Ace Mine without recovery of the gold value, caused the U. S. Bureau of Mines to conduct metallurgical tests on Ace ore through the early part of 1944.

These tests point the way to good metallurgy and satisfactory recoveries. A copy of this test is incorporated in this report. A resume of the test is as follows:

Ore used was removed from the dumps during the early spring of 1944 and had to be dug out of the snow.

A representative head sample assayed 0.24 ounce Au, 0.20 ounce Ag, 0.50 per cent WO_3, and 90.5 per cent SiO_2. Mineralogically, the ore may be classified as quartz in which sporadic grains of scheelite, pyrite, iron oxide, orthoclase, magnetite, muscovite and gold are disseminated. Scheelite occurs sporadically along fracture and cleavage planes and has

a maximum grain size of 48-mesh, varying down to 560-mesh. Associated with scheelite along the fracture and cleavage planes are pyrite, and native gold. Hence, find grinding of the ore is indicated to obtain appreciable liberation of both scheelite and gold.

Tabling tests were run at 48- and 65-mesh grinds to determine if satisfactory tungsten recoveries could be obtained by this method since a table is available in the present mill circuit. However, owing to the fine grinding required, consequent slime losses and inefficiency of tabling fine material, only 50-65 per cent recovery of tungsten was obtained by this method in low-grade 30-40 per cent WO_3 products. Microscopic examination of table concentrates revealed numerous quartz-scheelite middling particles. Hence, finer grinding and flotation were investigated.

Selective flotation of minus 100-mesh ore recovered 95.6 per cent of the gold in a pyrite concentrate and 65.4 per cent of the tungsten in a 52.3 per cent WO_3 product. A small amount of magnetite was removed from the final tungsten concentrate by wet magnetic separation. Approximately 83 per cent of the total gold was recovered from the gold-pyrite concentrate by amalgamation.

Microscopic examination showed a clean gold concentrate and that fine grinding would be necessary to make high grade tungsten concentrates as well as to increase recovery.

On the basis of above tests, 95 per cent of the gold can be recovered, and it is the writer's opinion that further tests will show that 75 per cent of the scheelite can be recovered, and that a high grade concentrate is a good possibility.

The work of the U. S. Bureau of Mines, Ore Dressing Department was done on dump ore and indicates that over $12.00 worth of tungsten is a possibility in each ton of gold ore. With a recovery of 60 per cent, the probable value of the tungsten is $7.20 per ton. Milling costs will be increased by not more than 40 cents a ton through the attempted recovery of the scheelite. It is not unreasonable to hope that an increased net profit of $3.00 per ton can be obtained from a recovery of the tungsten concentrate.

RECOMMENDATIONS

1. Crosscut 100 feet into the hanging wall from the small crosscut 40 feet south of the No. 1 level face. Stress in the vein structure and evidence of two veins intersecting and splitting at the south end of the ore shoot suggest the possibility of a vein developing or a shift of the Shamrock mineralization to the East. If ore is found in this zone, drift to the south and north.

2. Drift northward on Shamrock Vein on the No. 1 level 900 feet or more. This should develop new ore shoots and holds the possibility of intersecting the Ontario Vein.

3. Sink 100 feet on ore from the No. 1 level near Sample 1D10.

   a. Drift to the south and north 20 feet beyond apparent limits of Shamrock ore shoot.

   b. Continue down on vein another 100 feet and drift as directed in paragraph a.

4. Survey surface carefully and establish main portal 300 feet below No. 1 level on dip of vein. Drive crosscut to vein and drift to north and south to points 20 feet beyond apparent limits of ore shoot. Raise on vein to second sub level below No. 1 level.

5. Continue drifts on each sub level to new ore shoots if found on No. 1 level exploration.

6. Prospect the surface of the Ontario Vein with cuts every 50 feet. Continue Ontario tunnel until it crosscuts Ontario lead, drifting on vein if surface prospecting gives any indication of ore shoots.

Each of the above recommendations is partly contingent on the results and findings of the preceding steps.

7. Survey claims and apply for patents. Make contour map of property.

The above development program, if carried to its completion, will cost approximately $120,000.00.

8. Mill improvements:

Install secondary crusher and arrange to operate primary and secondary crusher by water power, using an auxiliary engine when water power is not available.

Revamp present mill. Install unit float cell in ball mill circuit. Put in two conditioners and two stages of flotation with the view to recovering gold and tungsten concentrates.

Power the mill with a 100 to 120 h.p. Diesel electric plant.

The above improvements in the mill will cost approximately $23,000.00 and will provide a plant which will make good recoveries on ore now developed in the mine.

9. Install a 500 to 600 cu. ft. diesel driven compressor.

10. Build and equip an assay laboratory.

11. Purchase mine operating equipment--drills, pumps, fans, cars, loaders, etc.

It is estimated that the above mining equipment will cost approximately $25,000.00, but it is essential to the successful operation of the mine itself.

12. Build locker room, change house, and shower facilities for miners and mill men.

13. Construct living quarters for key men, locating same at old camp site.

Construction of these and other miscellaneous buildings will approximate $21,500.00.

14. Estimated necessary operating capital $30,000.00. Miscellaneous and contingencies $15,000.00.

Total capital required to assure complete and competent operation $222,500.00.

PROGRAM OF OPERATION AND BUDGET

Employ a capable mining engineer full time and give him the assistance of a competent consulting engineer and geologist. Their respective compensations to be approximately $500.00 and $350.00 per month. An assayer should be employed at approximately $200.00 per month.

The mill needs a better than average superintendent for efficient operation and good recovery. His salary should approximate $400.00 per month.

The mill should be rebuilt as outlined, and various buildings constructed as recommended. This is the first step in reopening the Ace Mine for operation.

On completion of this step, a milling and development program should be embarked upon covering a two year period in which time the positive and probable development of ore in the mine should be milled out.

The continuous production of 50 tons of ore per day will require 20 to 30 men on ore bodies as exposed in the Shamrock Vein.

Ten additional men should be employed to carry on the exploration program. This will give you a monthly budget of approximately $10,950.00 per month for salaries and wages.

Supplies, powder, fuel, etc. will amount to approximately $9,500.00 per month for this size operation, making a total monthly budget of $20,450.00.

The milling of 50 tons of ore per day, 25 days each month, should gross an indicated return of $17,500.00 per month.

As one-third of the monthly operation expense is a part of the development program, the actual operating cost for the ore produced would be approximately $13,000.00; the $7,000.00 expended in the development coming from the $117,500.00 appropriated for the mine development.

The net operating profit per month during the mine development period should range between $3,000.00 and $4,000.00.

L. Lore Wartes

CLAIMS MAP

THE ACE MINE

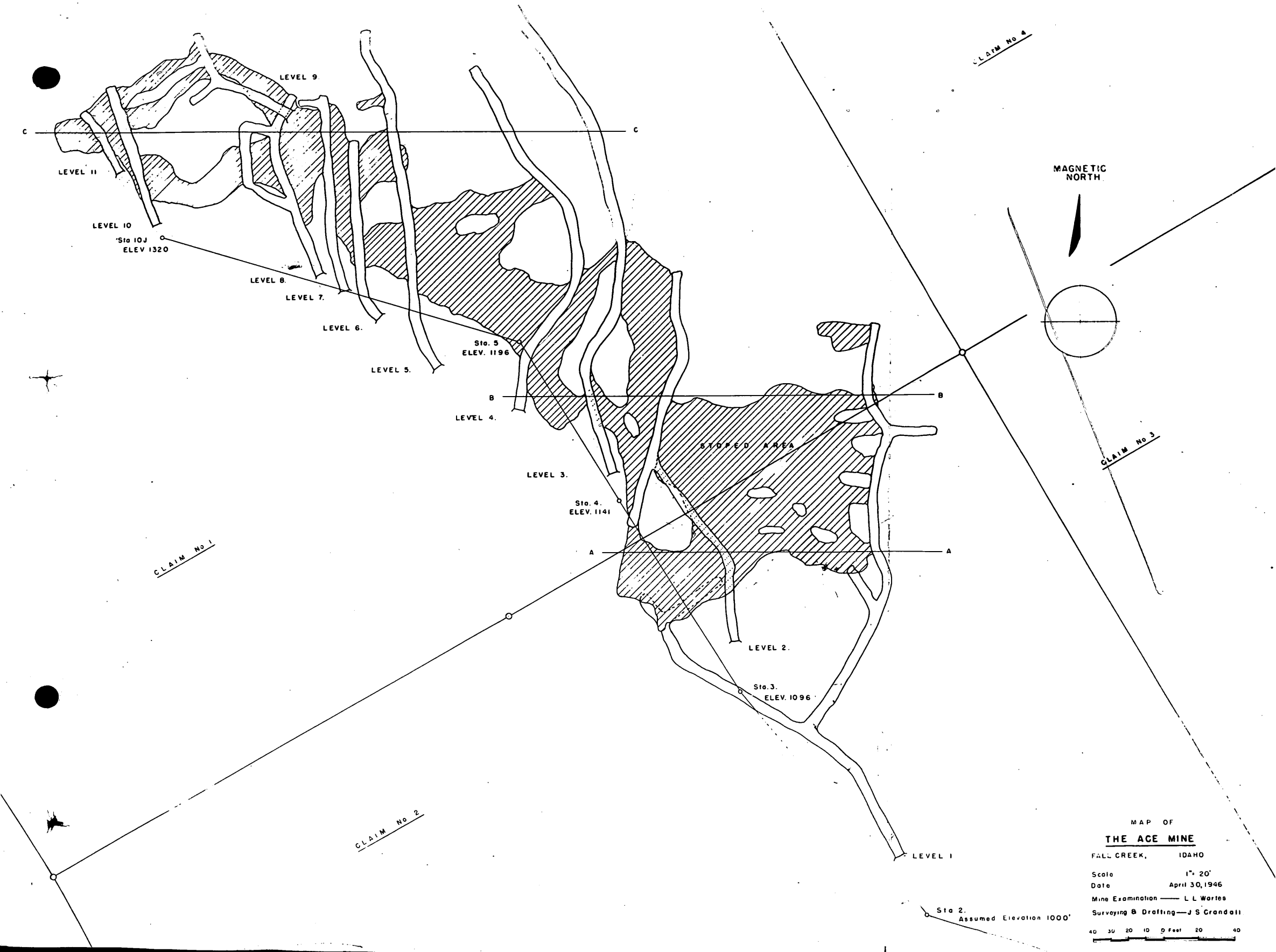
FALL CREEK,

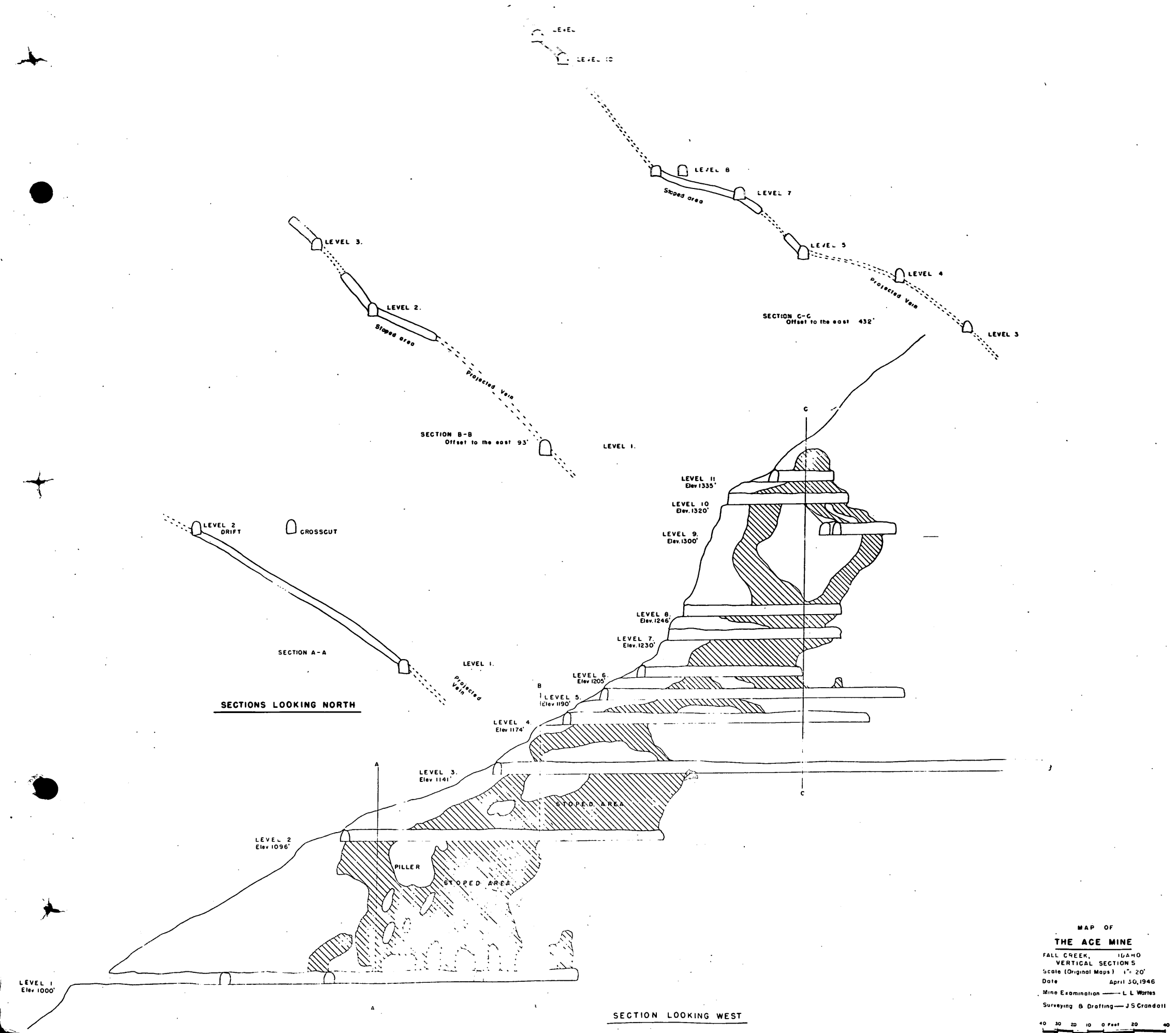
Scale (Original MAP)

Date

Mine Examination- L.I. Wartes

Surveying & Drafting


LEVEL 9
C
C
LEVEL 11
LEVEL 10
Sta 10J
ELEV 1320
LEVEL 8.
LEVEL 7.
LEVEL 6.
LEVEL 5.
Sta. 5
ELEV. 1196
B
B
LEVEL 4.
STOPED AREA
LEVEL 3.
Sta. 4.
ELEV. 1141
A
A
LEVEL 2.
Sta. 3.
ELEV. 1096
LEVEL 1
Sta 2.
Assumed Elevation 1000'
CLAIM No 1
CLAIM No 2
CLAIM No 3
CLAIM No 4
MAGNETIC
NORTH
MAP OF
THE ACE MINE
FALL CREEK, IDAHO
Scale 1" = 20'
Date April 30, 1946
Mine Examination —— L L Wartes
Surveying & Drafting —— J S Crandall
40 30 20 10 0 Feet 20 40


LEVEL 8
LEVEL 7
Stoped area
LEVEL 5
LEVEL 4
Projected Vein
LEVEL 3
SECTION C-C
Offset to the east 432'
LEVEL 3.
LEVEL 2.
Stoped area
Projected Vein
SECTION B-B
Offset to the east 93'
LEVEL 1.
LEVEL 2
DRIFT
CROSSCUT
SECTION A-A
LEVEL 1.
Projected Vein
SECTIONS LOOKING NORTH
C
LEVEL 11
Elev 1335'
LEVEL 10
Elev. 1320'
LEVEL 9.
Elev. 1300'
LEVEL 8.
Elev. 1246'
LEVEL 7.
Elev. 1230'
LEVEL 6.
Elev 1205'
B
LEVEL 5.
Elev 1190'
LEVEL 4.
Elev 1174'
A
LEVEL 3.
Elev 1141'
STOPED AREA
C
LEVEL 2
Elev 1096'
PILLER
STOPED AREA
LEVEL 1
Elev 1000'
A
SECTION LOOKING WEST
MAP OF
THE ACE MINE
FALL CREEK, IDAHO
VERTICAL SECTIONS
Scale (Original Maps) 1" = 20'
Date April 30, 1946
Mine Examination — L L Wartes
Surveying & Drafting — J S Crandall
40 30 20 10 0 Feet 20 40

R E P O R T

on

T H E A C E G O L D M I N E

Golden, Idaho County, Idaho

Examination and Report by
J. S. Crandall

Under General Supervision of
Mr. L. L. Wartes

May 11, 1946

I N D E X

	Page
Introduction	1
Property	2
Location	3
Accessibility	3
Topography	3
General Geology	4
Economics	5
Equipment	5
Mineralogy	6
Present Development of the Mine	7
Production Including Smelter Settlements Concentrates and Summary of Production 1934-1937 incl.	9
Assay Map	11
Ontario Vein	12
Ore Reserves	13
Remarks	14
Recommendations	15
Conclusion	16

INTRODUCTION

This report is written on the results of an examination made by the writer under the supervision of Mr. L. L. Wartes, and assisted by Mr. Fred Licht, an experienced sampler from the Morning Mine, Mullen, Idaho.

Work was started April 6, 1946 at which time there was four feet of snow at the property and the road had to be dozed of snow to permit access to the property.

Surveying was completed and sampling started April 18, 1946. Some six hundred pounds of samples were taken, one-hundred one (101) in all, giving an average of six pounds per sample. Many parts of the old workings were inaccessible due to caving; however, samples were taken around areas where ore was possible.

Sampling was completed April 26, 1946, which was in good time under the conditions.

The writer wishes to here acknowledge the splendid cooperation given by Mr. Felix Funke and Mr. Harvey White, without whose help the work would have taken much longer.

REPORT

PROPERTY: This property consists of five full claims and a fraction, located as the Shamrock Nos. 1, 2, 3, 4, 5, and 6, title being held by location only. The claims, Nos. 1, 2, 3, and 4, are located to cover the vein known as the Shamrock Vein on which most of the past operations have been carried out. This vein has a general strike between N. 5° W. and N. 10° W., and is strong and well defined underground but surface outcrops are lacking because they have been mined out at the points where they normally came to the surface.

Another vein known as the Ontario Vein, having a strike N. 85° W., is covered by claims 5 and 6. The Ontario Vein has only been prospected and uncovered over a length of about 500 feet. The vein is strong and appears to be up to 8 or 9 feet wide in places. If the Ontario Vein has not been faulted between its point of discovery and the projected point of intersection with the Shamrock Vein, this vein can be intersected by driving ahead on any one of the three lower levels of the mine.

LOCATION: Claims are located in section 24, T. 29, N. R. 7 E., Boise meridian, Idaho County, Idaho, 25 miles east of the town Grangeville, which is the county seat. The property lies about 4½ miles in a northerly direction from Fall Creek, a small settlement on the south fork of the Clearwater River, and is at an elevation of about 1,500 feet above the river, or approximately 4,600 feet elevation from sea level.

ACCESSIBILITY: The State highway from Grangeville to Elk City passes through Fall Creek, and is an all-season road, ordinarily kept in good condition. From Fall Creek a fair mine access road extends from the highway northerly to the property. This is an excellent truck road and can be negotiated at least in second gear by any passenger car. During the three or four months of winter, it is necessary to remove the snow from this 4½ miles of road periodically in order to be able to use it.

TOPOGRAPHY: This region is, in general, quite rough, and near the river is precipitous. The mountains rise abruptly for about 3½ miles back from the river and have an elevation there of about 5,500 feet or better. Heavy erosion is noticeable close to the river; however, as the tops of the mountains are reached, leveling off to a plateau is quite evident.

GENERAL GEOLOGY: The area is very near the edge of the central Idaho Batholith which is predominantly gneiss and schists. Fingers of the gneiss extend out through massive white quartzite throughout this portion of the area. The Shamrock Vein is located in the white quartzite which becomes highly silicious and has the appearance of quartz near the vein; in fact, in spots it is hard to determine the quartzite from the quartz material in the vein.

There are numerous quartz veins in the region and several have developed into mines which worked to a depth of a few hundred feet in the early days when high grading was the only possible method of recovering wealth from them; however, one mine about four miles from the Ace Mine at Golden, Idaho profitably operated to a depth of approximately 200 feet below the south fork of the Clearwater River and to some seven or eight hundred feet above. This mine, the Lone Pine by name, is in quartzite similar to the Ace Mine and is also near a contact between the quartzite and intrusive gneiss--comparable to the condition which exists at the Ace Mine.

Extensive fissuring and faulting has occurred in the quartzite; probably due to reaction caused by the intruding mass of gneiss, and in these fissures mineralization has taken place. This is typical of the Shamrock Vein which consists of a quartz gangue material, small amounts of pyrite, arsenopyrite, and galena, and in some certain spots sphalerite, all of which

appear to have gold associated with them; however, the arsenopyrite probably is the only mineral which actually carries gold.

ECONOMICS: Since the walls of the Shamrock Vein are very hard and compact, mining here requires very little timber; however, there is ample timber for all purposes of construction, mining, or fuel on the claim group alone. The mine is located on a mountain stream named Fall Creek, which would supply enough water for a considerable operation; also, would lend itself to the development of electrical power as it has a considerable rate of fall near the mine. At present the mill develops power with a Pelton wheel, using the water from this creek.

EQUIPMENT: At the present time there is a mill on the property which was built in 1917 and has been remodeled one or two times. It is in quite a dilapidated condition; however, it could conceivably be operated on a small scale without a great deal of repair. The equipment in the mill consists of a 4' X 10' steel bar grizzly, a 10 X 16 Blake type crusher, a 5 X 4 Hardinge ball mill, a 30" Dorr type classifier, a small Hartz type jig, a 56" X 48" silver plated copper amalgamating plate, a 24" Denver Equipment unit flotation cell, and a Wilfley pilot table. This machinery is operated by the Pelton Wheel mentioned above. The water power is not sufficient during the winter months,

and is supplemented by a Buick engine. The arrangement of the mill is very poor and economic operation with acceptable recoveries would be impossible as the mill stands.

MINERALOGY: The valuable metal content of the ore in the Shamrock Vein is primarily gold with small amounts of silver and lead; also, an undetermined amount of tungsten in the form of disseminated scheelite, which up to the present time has never been recovered. Tungsten samples have been taken, however, which assayed as high as 6.4 per cent WO_3.

Photomicrographs were made from polished sections of typical ore taken from Level No. 1, and are included in this report. This study of the polished sections indicate that mineralization in the Shamrock Vein and the smaller vein intersecting it are similar and, undoubtedly, of the same origin and time. It appears that quartz was introduced first and is being replaced somewhat by some of the sulphide minerals, mainly pyrite. Replacement lines are evident in much of the ore by microscopic examination. This alone would give a reason for the fact that small hand samples are apt to show blank assays while tonnage samples and mill runs show good values.

According to past records, probably in the neighborhood of 80 per cent of the values recovered were taken out as gold

amalgam. Some concentration has been attempted; however, not to any great extent, but when the sulphides were concentrated their value was high, running from $300.00 per ton up to $2,000.00 per ton of concentrate. The predominant sulphide is probably iron pyrite with arsenopyrite next. Both would appear to be amenable to a flotation process.

PRESENT DEVELOPMENT OF THE MINE: The vein has been developed by eleven adit tunnels over a total distance along the vein of about 500 feet. Stoping has been done from the lowest level, or No. 1, on up through the successive levels to No. 11 at the top and almost to the surface above that. It is perfectly evident that past mining practice confined itself to "high grading" and many pillars and much broken ore are left in the stopes which probably at the present time, with good management, and proper operation, could be economically milled.

A transit and Brunton survey was made of the workings. The accuracy was not of a degree to be used in making a working map, but for the needs of the present time it is sufficient. Included with this report are maps with sections showing all of the tunnels and stoping incident to the tunnels. Also included is an assay map with the samples located and the values found, along with the width of the samples.

No. 1 tunnel, which is the main haulage drift for the present mill, was driven N. 25° W. from a point which was to the west of the vein. At about 105 feet from the portal, a crosscut was driven due north for approximately 210 feet where the vein was intersected. The vein was drifted on in a northwest direction and stoping started immediately above this level. At the south end of this stope, which continues up to level No. 2, there is evidence of two veins, the intersection of which has been stoped out, but from the appearance of the stope considerable ore was taken out along the intersection of veins which continues up through the stope and above level No. 2.

The vein which intersects the Shamrock Vein at this point seems to be slightly smaller, but the ore is of the same general nature and the vein runs approximately N. 15° E. This smaller vein has been stoped at several points on the other levels, namely 3, 4, and 5 as a continuation of the main stopes on the Shamrock Vein. Apparently, this second vein was not evident to the previous operators; however, mention has been made of a split in the ore body. At the face of No. 1 drift there is ore; however, this point has been pinched down somewhat and evidence of movement and faulting along the vein zone were observed. This tunnel opens the vein for a distance of 165 feet. The stope above No. 1 level is 100 feet long and

averages about 6 feet wide except at the vein intersection where it is from 10 to 12 feet wide. Ore is in place in both the north and south ends of the stope, and in the north end of the stopes on up to No. 6 level. Above No. 5 the levels are not accessible as caving has occurred considerably throughout the old workings during this last three years of idleness.

PRODUCTION: There are very few records available as to production, particularly prior to 1934. Since that date part of the production is indicated by official mint and smelter return records, which we have in hand. In 1942 the mine office building and bunk house were destroyed by fire and many of the records burned; however, a tabulated record of production can be taken from a report made by Mr. A. G. Kirby, and is as follows:

SMELTER SETTLEMENTS CONCENTRATES & CRUDE ORE

LOT NO.	NET WGHT TONS	CONTENTS OZS GOLD	CONTENTS OZS SILVER	SETTLE'T P T GOLD	SETTLE'T P T SILVER	GROSS SETTLE'T $'s
1.	1.45	8.07	3.65	$257.866	2.67	$ 354.73
2. Flot	1.362	12.62	7.60	405.193	5.559	533.95
3.	1.6545	6.31	3.48	207.083	2.546	325.96
4.	4.429	1.92	1.60	61.091	1.170	230.32
5.	4.95	2.11	2.10	67.137	1.536	290.33
6. Con.	0.658	15.18	6.45	488.181	4.718	312.96
7.	4.230	1.87	1.55	59.50	1.134	212.64
*8.	4.480				est.	211.81
9.	5.013	1.700	1.95	54.091	1.188	212.03
10.	8.034	0.775	1.30	24.659	0.792	148.23
11.	7.547	1.055	1.05	33.568	0.64	205.34
12.	4.55	1.49	1.10	47.409	0.67	180.78
	48.262	Avg 2.354	1.688			$3,219.08

*Smelter receipt but no settlement sheet

SUMMARY OF PRODUCTION 1934 - 1937 Inc

Crude ore shipped & milled.	2,396.58 tons		
Shipped to mint, Gold fine Ozs.	1,204.27	@$35.	$59,021.62
ditto	482.06		
Shipped to Smelter " " "	113.61	"	3,976.35
Gross Value	1,799.94		$62,997.97
" " per ton of ore			26.28
Net " " " " " from mint & smelter			25.975

The figures shown on the previous page are substantiated by smelter reports.

Unofficial estimates of total mine production up to 1941 run as high as $394,000.00 in gold and silver, and during the time of this production mill losses in the form of sulphides and the free gold, which was difficult to amalgamate, was terrific. Fine grinding was, of course, impossible with a stamp mill. The ball mill, which is part of the present equipment, was installed in 1942 and milled only about 200 tons before the mine was shut down because of the office building fire and the war. Photomicrographs and other study show that grinding should be down in the neighborhood of minus 80 to 100 mesh for complete particle liberation.

ASSAY MAP: The assay map enclosed shows a section along the plane of the vein and gives the sample width and value where each sample was taken. Also on this map are spotted areas in the stope where certain different amounts of high grade ore were removed. Values and tonnage are indicated in each case.

Sampling was done along the vein in No. 1 drift at 10 foot intervals. The vein at this horizon is strong and continuous; however, there are a few points where it narrows down to a few inches but immediately widens out. The average vein width here is about 2½ feet with some values running into the quartzite walls for a short distance, which varies.

Sampling was also done in Level 2, 3, 4, and 5 drifts and in the stopes as shown. The assay map includes only Levels 1 to 6 incl. as above Level No. 5 caving made the workings inaccessible.

Values found in the samples are phenomenally low and do not check tonnage samples taken in the past. This is characteristic of small samples taken through this area in the many different gold mines. Past experience has been that at least 75 per cent of all hand samples will be blank, but tonnage samples actually produce values enough to be considered good mill feed and in some cases high grade ore. In the past, high grade ore was shipped directly to Bunker Hill Smelter.

ONTARIO VEIN: Open cuts have exposed this vein for about 500 feet along its strike which is N. 85° W. The projection of this vein and the projection of the Shamrock Vein intersect at approximately 550 feet from the face of Level No. 1 drift.

Definite evidence was found that cross faulting has occurred between the exposed portion of the Ontario Vein and this theoretical point of intersection. The displacement may be large or small. No indication was found as to direction of this faulting or the magnitude of movement. This faulting almost eliminates the possibility of prospecting the Ontario Vein from present workings; however, the position of the Ontario

Vein lends itself to prospecting without too great expense. Also, there is one very well located cross cut tunnel started in the right direction and is in a few hundred feet, which could be very economically driven ahead to cut the vein at about 200 to 300 feet of depth.

The sample taken from the Ontario Vein did not show very great value; however, samples have been taken which assayed as high as $12.00 per ton in gold. The ore has a good appearance and is similar to other high grade ores of this district. No shipments of ore have ever been made from this vein.

ORE RESERVES: The past mining method of "high grading" has forced stoping to be done in a haphazard manner. Pillars and irregular blocks of ore are left in all of the stopes. These along with the considerable volume of backfill and gob material make up a total tonnage of about 13,000 tons of ore as available reserves. Past mill test runs on this material show it to contain about $5.60 to $7.50 in gold.

Ore which is exposed on three sides throughout the mine can be estimated at approximately 2,650 to 3,000 tons. According to Kirby's Mill test No. 2, the gold content of this ore should be about $15.00 per ton.

The total proven ore as shown above would be about 16,000 tons with a total value of $117,800.00.

Probable ore or ore exposed on two sides in the mine can be estimated at about 5,000 tons @ 15.00 per ton, giving a total value of $75,000.00.

Possible ore, or ore exposed on one side, throughout the mine can be estimated at about 10,000 tons with a gold content of about $15.00 per ton, giving a total value of $150,000.00.

By combining the above we arrive at the total ore value of $342,000.00.

REMARKS: Because of milling methods, namely stamp mill and amalgamating plates, used in the past on this property, a large percentage of the values contained in the ore were lost in the process of treatment. Some of the losses were in the form of auriferous sulphides. Part of the losses were free gold which, although liberated, were not amenable to amalgamation for one reason or another; and another part were free gold and sulphides which were fine grained and were not liberated by the coarse grind of stamp milling.

These losses naturally forced the operators to feed the mill with only the higher grade ores.

For many years mining was done entirely by hand drilling which also leads to the practice of "high grading".

These methods and practices are very much in evidence in the mine by the many pillars and irregular blocks of ore

left in the mine, and the large amount of backfill which consists, in the main, of low grade but good milling ore.

Development has never been carried as far ahead of stoping as is good mining practice.

Prospecting into the walls of the vein and ahead in the vein zone is noticeably not sufficient.

RECOMMENDATIONS: It is the writer's opinion that with a vigorous program of prospecting and exploration on the extension of the ore bodies and the vein zone both laterally and in depth, more ore shoots will be developed. Also, with such a program the present ore bodies, which have been partially stoped, will be found to have considerable extension beyond the present faces of stopes in many parts of the mine.

It is the writer's opinion that special effort should be made to drift along the vein not only in a N. W. direction, but also S. E. in Level No. 1. Also, the ore body warrants exploration to depth with at least one winze in the ore and sunk from Level No. 1.

Also, the Ontario Vein should be thoroughly prospected and explored both on the surface and at depth. It is recommended that the present cross cut tunnel below the outcrop be driven ahead to cut the vein.

It would be advisable to set up an assay office to check the exploration. Also, accurate survey should be made and maps prepared to govern the exploration work.

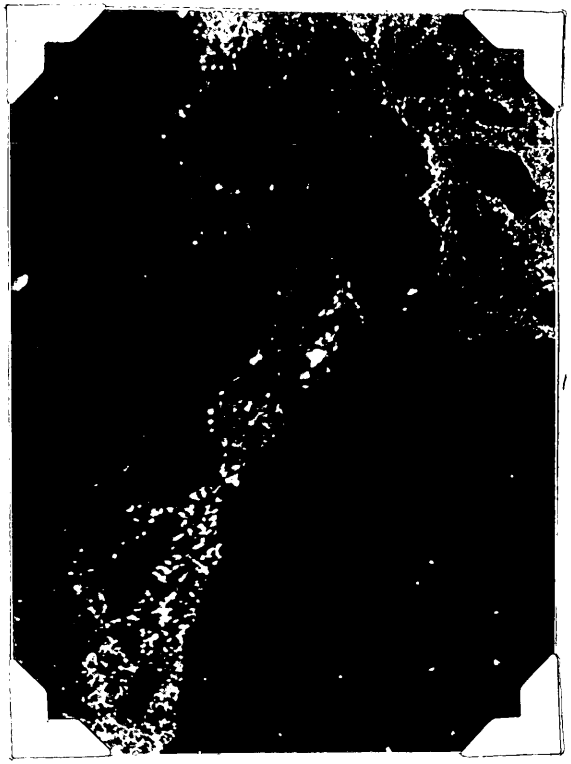
CONCLUSION: Projection of the Shamrock Vein indicates the possibility of locating a mill several hundred feet along the vein below the present mill site.

With the proving and development of ore on lower levels and the erection of a modern treating plant in the proper location, it will be economically possible to pull all of the remaining pillars, bodies of ore and low grade ore left as backfill in all of the old workings. This material could be profitably milled along with a large portion of all of the many dumps scattered over the property and amounting to about 2,000 tons.

With some research and laboratory work, undoubtedly a method could be arrived at whereby an appreciable amount of the scheelite content of the ore can be extracted with a profit.

Signed John S. Crandall
John S. Crandall
Metallurgist and Mining Engineer

L. LORE WARTES



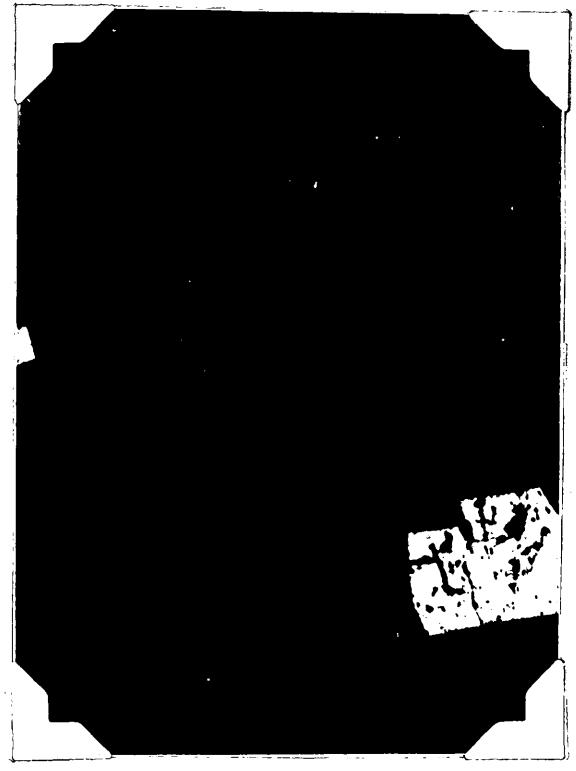
No. 1
Briquette #3. X 95
Dark Ore - Banded
Shamrock Vein
Pyrite Replacing Quartz

No. 2
Briquette #3. X 95
Dark Ore - Banded
Shamrock Vein
Dark Quartz - Light Quartz - Pyrite Replacing

No. 3
Briquette #3. X 95
Dark Ore - Banded
Shamrock Vein
Pyrite Replacing Dark Quartz

L. LORE WARTES

L. LORE WARTES



No. 4
Briquette #2. X 95
Light Quartz Ore
Shamrock Vein
Quartz with Pyrite Phenocryst

No. 5
Briquette #4. X 95
Light Quartz Ore
Small N. 15 E. Vein at
Intersection
Quartz with Pyrite Phenocrysts

L. LORE WARTES

RANDOM SAMPLING
(Mentioned in Report by L. Lore Wartes
Under Introduction)

Sample No.	Gold Oz.	Silver Oz.	Value
R1	0.56	.40	19.88
R2	0.04	Trace	1.40
R3	0.40	.20	14.14
R4	0.46	.40	16.38
R5	2.16	0.2	75.75
R6	1.10	.60	38.92
R7	8.40	0.40	294.28
R8	27.95	9.50	984.99
R9	3.52	2.6	125.04
R10	1.00	0.2	35.14
R11	5.64	2.3	199.03
R12	1.94	---	67.90
R13	0.63	0.2	22.19
R14	7.95	2.2	279.81
R15	1.04	2.0	37.82
R16	1.08	0.7	38.29
R17	20.82	6.1	733.03
R18	1.72	1.2	61.05
R19	4.40	1.6	172.63
R20	8.82	5.1	312.32
R21	4.25	2.7	150.66
R22	2.08	1.1	73.64
R23	.14	0.2	5.05
R24	.02	Trace	.70
R25	0.40	---	14.00
R26	6.45	4.4	229.13
R27	0.26	---	9.10
R28	0.14	---	4.90
R29	0.20	0.2	7.12
R30	3.68	1.1	129.50
R31	0.72	1.2	26.12
R32	2.24	1.5	79.55
R33	1.86	1.7	66.40
R34	0.16	---	5.60

L. LORE WARTES

BUNKER HILL SMELTER

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

P. O. ADDRESS: KELLOGG, IDAHO
R. R. STATION BRADLEY, IDAHO

In Account With

CHAMROCK MINE -- H. W. WHITE

Name of Mine: Chamrock | Mine Lot No. | Smelter Lot No. 9

Location: Golden, Idaho | R. R. Shipping Point: Golden, Idaho. | Class: Crude

DATE OF ARRIVAL 8/31/38 | DATE OF SAMPLING 8/8/38 | DATE OF SETTLEMENT 8/8/38

Car Initial	Car Number	Gross Weight Lbs.
By truck		10180

TOTAL GROSS WEIGHT 10180
SACKS WEIGHT OF SACKS
GROSS WEIGHT OF ORE
MOISTURE 1.5 POUNDS 153
DRY WEIGHT OF ORE 10027

Settlement Assays		
Gold	1.70	Ounces Per Ton
Silver	1.99	Ounces Per Ton
Copper		Per Cent
Lead		Per Cent
Iron	2.1	Per Cent
Insoluble	88.8	Per Cent
Lime		Per Cent
Sulphur	1.4	Per Cent
Zinc		Per Cent
Antimony		Per Cent
Arsenic	.1	Per Cent

QUOTATIONS

SILVER @ E. & W. J. P. PRICE FOR
LEAD @ E. & W. J. P. PRICE FOR
COPPER @ E. & W. J. P. PRICE FOR
LESS CENTS PER POUND

Payment for Metals		Value per Ton
GOLD	OZ	PER OZ. $
GOLD	OZ	PER OZ $
GOLD 1.70 OZ	@ 31.81035 PER OZ	$ 54.091
SILVER 1.99 OZ	@ .64100 PER OZ	$ 1.128
LEAD	%	PER LB $
COPPER	%	PER LB $
		GROSS VALUE $ 55.079
LESS TREATMENT		8.000
NET VALUE PER TON		$ 47.079

Treatment	Per Ton
TREATMENT CHARGE (BASED ON	$ 8.000
LESS % PO UNDER	$
PLUS % PO OVER	$
ARSENIC (BAS OFF % SULPHUR ON SILVER OVER) OZ @ CTS PER OZ	$
CHLORIDE PENALTY OVER	$
BISMUTH PENALTY	$
ZINC PENALTY OVER	$
ANTIMONY AND ARSENIC OVER	$
MOISTURE OVER	$
FREIGHT (ON LEAD) FROM SOUTH LESS @ $ PER TON	$
TOTAL TREATMENT	$ 8.000

TOTAL OZS. GOLD IN THIS SHIPMENT 8.503
TOTAL OZS. SILVER IN THIS SHIPMENT 9.79

SETTLEMENT

DRY WEIGHT 10027 POUNDS 5.0135 TONS @ $ 47.079 PER TON EQUALS $237.03

LESS FREIGHT FROM SHIPPING POINT TO BRADLEY IDAHO
BASED ON VALUE OF $ PER GROSS TON
GROSS WEIGHT POUNDS TONS @ $ PER TON EQUALS $
PRELIMINARY PAYMENT
EXTRA SAMPLING
UMPIRE CHARGES
CUTTING LEAD
CUSTOM CHARGES

Bunker Hill Warehouse for supplies 25.00

NET PROCEEDS $ 212.03

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

BY

BUNKER HILL SMELTER

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

P. O. ADDRESS: KELLOGG, IDAHO
R. R. STATION: BRADLEY, IDAHO

In Account With

CHAMROCK MINE

Name of Mine: Chamrock | Mine Lot No. | Smelter Lot No. 6

Location: Golden, Idaho | R. R. Ship'ng Point | Class: Gold Ctg.

DATE OF ARRIVAL 10/23/37 | DATE OF SAMPLING 10/23/37 | DATE OF SETTLEMENT 10/23/37

Car Initial	Car Number	Gross Weight Lbs.
By truck		1370

TOTAL GROSS WEIGHT 1370
18 SACKS WEIGHT OF SACKS 22
GROSS WEIGHT OF ORE 1348
MOISTURE 2.3 POUNDS 31
DRY WEIGHT OF ORE 1317

Settlement Assays		
Gold	18.18	Ounces Per Ton
Silver	0.46	Ounces Per Ton
Copper		Per Cent
Lead		Per Cent
Iron	11.1	Per Cent
Insoluble	68.8	Per Cent
Lime		Per Cent
Sulphur	6.2	Per Cent
Zinc		Per Cent
Antimony		Per Cent
Arsenic	3.9	Per Cent

QUOTATIONS

SILVER @ E. & W. J. P. PRICE FOR 10/23/37 .77 PER OZ.
LEAD @ E. & W. J. P. PRICE FOR
COPPER @ E. & W. J. P. PRICE FOR
LESS CENTS PER POUND

Payment for Metals		Value per Ton
GOLD	OZ	PER OZ. $
GOLD	OZ	PER OZ $
GOLD 18.18 OZ	@ 30.81035 PER OZ	$ 493.101
SILVER 0.46 OZ	99 % @ .77 PER OZ	$ 4.718
LEAD	% 90 %	PER LB. $
COPPER	% 100 %	PER LB $
		GROSS VALUE $ 502.699
LESS TREATMENT		$ 12.490
NET VALUE PER TON		$ 490.449

Treatment	Per Ton
TREATMENT CHARGE (BASED ON	$ 9.000
LESS % PO UNDER	$
PLUS % PO OVER	$
ADDITIONAL REFINING CHGS. ON SILVER OVER .02. OZ @ CTS PER OZ.	$
SULPHUR PENALTY OVER 4 @ .25	$ .550
BISMUTH PENALTY @	$
ZINC PENALTY OVER @	$
ANTIMONY AND ARSENIC OVER 1 @ 1.00	$ 2.900
MOISTURE OVER @	$
FREIGHT ON LEAD TO NEW YORK LESS @ $ PER TON	$
TOTAL TREATMENT	$ 12.450

TOTAL OZS. GOLD IN THIS SHIPMENT 0.000
TOTAL OZS. SILVER IN THIS SHIPMENT 4.25

SETTLEMENT

DRY WEIGHT 1317 POUNDS- 0.0000 TONS @ $ 490.449 PER TON EQUALS $ 328.96

LESS FREIGHT FROM SHIPPING POINT TO BRADLEY IDAHO
BASED ON VALUE OF $ PER GROSS TON
GROSS WEIGHT POUNDS- TONS @ $ PER TON EQUALS $
PRELIMINARY PAYMENT $
EXTRA SAMPLING $ 10.00
UMPIRE CHARGES $
CUTTING LEAD $
CUSTOM CHARGES $

NET PROCEEDS $ 312.96

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

BY

L. LORE WARTES

BUNKER HILL SMELTER

Bunker Hill & Sullivan Mining & Concentrating Company

to Account With

Shamrock Mine -- Harvey White

Name of Mine: Shamrock | Mine Lot No. | Smelter Lot No. 18

Location: Golden, Idaho | R. R. Shipping Point: By truck | Class: Au crude

Date of Arrival: 9/0/49 | Date of Sampling: Dec 9 | Date of Settlement: 9/12/49

Car Initial	Car Number	Gross Weight Lbs.
By truck	8991	

Settlement Assays		
Gold	8.098	Ounces Per Ton
Silver	2.05	Ounces Per Ton
Copper		Per Cent
Lead		Per Cent
Iron	2.0	Per Cent
Insoluble	67.0	Per Cent
Sulphur	.8	Per Cent
Zinc	.2	Per Cent
Antimony		Per Cent
Arsenic	.10	Per Cent
Bismuth		Per Cent

Quotations

Silver @ S. & B. J.-P. Price For: 9/6/49 .70625 Per Oz

Lead @ S. & B. J.-P. Price For:

Copper @ S. & B. J.-P. Price For:

Less: Cents Per Pound

Total Gross Weight	8991	
Less Weight of Sacks	01	
Gross Weight of Ore	8990	
Moisture 0.8 % Pounds	12	
Dry Weight of Ore	8980	

Payment for Metals — Value Per Ton

Gold	8.099 Oz	@ 31.01000	Per Oz	$ 100.126
Silver	2.05 Oz	@ .70625	Per Oz	$ 1.919
Copper	%		Per Lb	$
Lead	%		Per Lb	$
Gross Value				$ 110.045
Less Treatment				$ 9.000
Net Value Per Ton				$ 101.045

Total Ozs Gold in This Shipment: 8.325

Total Ozs Silver in This Shipment: 8.47

Treatment — Per Ton

Treatment Charge (Based On)	$ 9.000
Less % Pb Under	$
Plus % Pb Over	$
Additional Refining Chgs. On Silver Over Oz. Oz @ Cts. Per Oz.	$
Sulphur Penalty Over	$
Bismuth Penalty	$
Zinc Penalty Over	$
Antimony and Arsenic Over	$
Moisture Over	$
Freight On Lead To New York Less @ $ Per Ton	$
Total Treatment	$ 9.000

Settlement

Dry Weight 8980 Pounds 1.919 Tons @ 101.045 Per Ton Equals		$ 19
Less Freight From Shipping Point To Bradley, Idaho		
Based On Value Of $ Per Gross Ton		
Gross Weight Pounds— Tons @ $ Per Ton Equals		$
Preliminary Payment		$
Extra Sampling	10.00	$
Hauling to Dale Holbrook, Golden, Idaho	25.00	$
Umpire Charges		$
Cutt On Lead		$
Custom Charges		$
Amount due on receipt of silver affidavits: 8.47 ozs. @ 99% @ .70625 - .3478 = .00878	1.87	$
To Harvey White, Golden, Idaho — Net Proceeds		$ 16

Rates subject to change without notice except on one month contract. An extra charge of $5.00 will be made for sampling all lots of less than five tons.

Bunker Hill & Sullivan Mining & Concentrating Company

By

BUNKER HILL SMELTER

Bunker Hill & Sullivan Mining & Concentrating Company

to Account With

SHAMROCK MINE

Name of Mine: Shamrock | Mine Lot No. | Smelter Lot No. 8

Location: Golden, Idaho | R. R. Shipping Point: By truck | Class: Au. Crude

Date of Arrival: 10/10/37 | Date of Sampling: 10/10/37 | Date of Settlement: 10/10/37

Car Initial	Car Number	Gross Weight Lbs.
By truck		9980

Settlement Assays		
Gold	8.11	Ounces Per Ton
Silver	2.10	Ounces Per Ton
Copper		Per Cent
Lead		Per Cent
Iron	1.6	Per Cent
Insoluble	95.0	Per Cent
Lime		Per Cent
Sulphur	1.1	Per Cent
Zinc		Per Cent
Antimony		Per Cent
Arsenic	Tr.	Per Cent

Quotations

Silver @ S. & B. J.-P. Price For: 10/16/37 .77 Per Oz

Lead @ S. & B. J.-P. Price For:

Copper @ S. & B. J.-P. Price For:

Less: Cents Per Pound

Total Gross Weight	9980	
Less Weight of Sacks		
Gross Weight of Ore		
Moisture 0.8 % Pounds	80	
Dry Weight of Ore	9900	

Payment for Metals — Value Per Ton

Gold	8.11 Oz	@ 31.01000	Per Oz	$ 97.137
Silver	2.10 Oz	95% @ .77	Per Oz	$ 1.936
Lead	%	90% @	Per Lb	$
Copper	%	100% @	Per Lb	$
Gross Value				$ 99.073
Less Treatment				$ 9.000
Net Value Per Ton				$ 90.073

Total Ozs Gold in This Shipment: 10.445

Total Ozs Silver in This Shipment: 10.40

Treatment — Per Ton

Treatment Charge (Based On)	$ 9.000
Less % Pb Under	$
Plus % Pb Over	$
Additional Refining Chgs. On Silver Over Oz. Oz @ Cts. Per Oz.	$
Sulphur Penalty Over	$
Bismuth Penalty	$
Zinc Penalty Over	$
Antimony and Arsenic Over	$
Moisture Over	$
Freight On Lead To New York Less @ $ Per Ton	$
Total Treatment	$ 9.000

Settlement

Dry Weight 9900 Pounds— 4.950 Tons @ 90.073 Per Ton Equals		$ 300.33
Less Freight From Shipping Point To Bradley, Idaho		
Based On Value Of $ Per Gross Ton		
Gross Weight Pounds— Tons @ $ Per Ton Equals		$
Preliminary Payment		$
Extra Sampling	10.00	$
Umpire Charges		$
Cutt On Lead		$
Custom Charges		$
Net Proceeds		$ 290.33

Rates subject to change without notice except on one month contract. An extra charge of $5.00 will be made for sampling all lots of less than five tons.

Bunker Hill & Sullivan Mining & Concentrating Company.

By

L. LORE WARTES

THE C.M. FASSETT CO.

ENGINEERING LABORATORIES

MEMORANDUM OF ASSAY MADE FOR F.C. FUNKE

Spokane, Washington JAN. 3 1892

ASSAY VALUE PER TON OF 2 000 POUNDS AVOIRDUPOIS

SAMPLE MARK	Zinc at cts. per lb. Per Cent	Zinc at cts. per lb. DOLLARS CTS	Copper at cts. per lb. Per Cent	Copper at cts. per lb. DOLLARS CTS	Lead at cts. per lb. Per Cent	Lead at cts. per lb. DOLLARS CTS	Silver at 71 cts. per oz. OUNCES	Silver at 71 cts. per oz. DOLLARS CTS	Gold at [illegible] OUNCES	Gold at [illegible] DOLLARS CTS	Total DOLLARS CTS
#1							None	—	041	1435	14.35
#2							01	007	091	3185	31.92
#3							None	—	033	1155	11.55
#4							Trace	—	006	210	2.10
#5							01	007	011	385	3.92

All samples saved for one year. Pulps can be had. Send these samples for check assays, at any time.

No. 12583 1-35

Charges, $ 7.50

THE C.M. FASSETT CO. Inc.

Robert W. Simmons

PRICES { GOLD ONLY, $1.00; COPPER, $1.00; LEAD, 50c
GOLD AND SILVER, $1.00; SILVER ONLY, 50c

GOLD and SILVER BOUGHT. SPECIMENS BOUGHT, SOLD or EXCHANGED

Wm. H. Stowell & Co.

CHEMISTS AND ASSAYERS
421 SPRAGUE AVENUE
TELEPHONE MAIN 5824

Memorandum of Assay of Rock *made for* A. W. White

Spokane, Wash., [illegible]

ASSAY VALUE PER TON OF 2,000 POUNDS AVOIRDUPOIS

SAMPLE MARK	per lb. Per Cent	per lb. DOLLARS Cents	per lb. Per Cent	per lb. DOLLARS Cents	Silver at 71 cents per oz. OUNCES	Silver at 71 cents per oz. DOLLARS Cents	Gold at [illegible] per oz. OUNCES	Gold at [illegible] per oz. DOLLARS Cents	Total DOLLARS Cents
No. 1 Quartz					5	35	88	[illegible]	[illegible]
No. 2 Core					15.1	10 72	37 75	[illegible]	[illegible]
No. 3									
No. 4 Quar. of Core									
No. 5 Silica	12 %		Lime	no					
No. 6 Iron Fe	61 %		Platinum	no					
No. 7 Sulphur S.	20 %		Tin	no					
No. 8 Magnesia	3 %		Copper	no					
Alumina	2 %		Lead	no					

No. 1300 3-4

Charges $ 12.00

PRICES { GOLD ONLY, $1.00; COPPER, $1.00; LEAD, 50c
GOLD AND SILVER, $1.00; SILVER ONLY, 50c

GOLD and SILVER BOUGHT. SPECIMENS BOUGHT, SOLD or EXCHANGED

Assay Office of Wm. H. Stowell & Co.

421 SPRAGUE AVENUE
TELEPHONE MAIN 5824

Memorandum of Assay of Rock *made for* A. W. White

Spokane, Wash. [illegible]

ASSAY VALUE PER TON OF 2,000 POUNDS AVOIRDUPOIS

SAMPLE MARK	per lb. Per Cent	per lb. DOLLARS Cents	per lb. Per Cent	per lb. DOLLARS Cents	Silver at 71 cents per oz. OUNCES	Silver at 71 cents per oz. DOLLARS Cents	Gold at [illegible] per oz. OUNCES	Gold at [illegible] per oz. DOLLARS Cents	Total DOLLARS Cents
No. 1 Quartz					33.4	[illegible]	[illegible]		[illegible]
No. 2 Quartz					47.3	[illegible]	[illegible]		[illegible]
No. 3 Core					[illegible]	[illegible]	[illegible]		[illegible]
No. 4									
No. 5									
No. 6									
No. 7									
No. 8									

No. 10998 4-6

Charges $ 3.00

Below tunnel

No. 3 [illegible]

U. S. MINT RETURNS
Shipped by Harvey White
Actual Deposit Slips Inspected
by L. L. Wartes and J. S. Crandall
(Available for Inspection)

Description of Bullion	WEIGHT - OZS.		GOLD		SILVER			CHARGES	NET VALUE
	Before Melting	After Melting	Fineness 1,000ths	Value Dollars	Fineness 1,000ths	¢ per Fine Oz	Value Dollars	Dollars	Dollars
August 2, 1934 AM.CKS & GRS (Quicksilver & dirty)	101.55	83.03	697	2025.48	250	46	9.55	9.80	2025.23
August 22, 1934 A.CKS.GRS. (quicksilver)	148.10	121.24	652	2766.68	243	49	14.44	13.38	2767.74
September 28, 1934 Retort	130.69	99.28	651	2262.09	254	49	12.35	13.13	2261.31
November 13, 1934 Retort & Bars	94.60	71.61	644½	1615.32	350	53	13.28	7.90	1620.70
May 22, 1935 Retort	29.65	25.10	603	529.73	235	75	4.42	3.70	530.45
June 10, 1935 Retorts	20.35	14.08	698-3/4	344.33	252	72	2.55	5.42	341.46
June 18, 1935 Retort	32.05	29.72	708-3/4	737.24	257	72	5.49	4.03	738.70
July 2, 1935 Retort	26.30	24.09	715	602.84	252	69	4.19	3.47	603.56

Description of Bullion	WEIGHT - OZS. Before Melting	WEIGHT - OZS. After Melting	GOLD Fineness 1,000ths	GOLD Value Dollars	SILVER Fineness 1,000ths	SILVER ¢ per Fine Oz	SILVER Value Dollars	CHARGES Dollars	NET VALUE Dollars
July 25, 1935 Retort	74.63	67.20	725	1705.20	257	67	11.57	7.95	1708.82
August 6, 1935 Retort	115.65	107.73	727½	2743.06	247	67	17.82	12.17	2748.71
August 23, 1935 Retort	120.50	91.36	711½	2275.07	253	65	15.02	10.34	2279.75
September 9, 1935 Retort	38.47	35.87	733	920.22	245	65	5.71	4.73	921.20
October 5, 1935 Retort	79.28	72.00	734¼	1850.31	230	65	10.76	8.51	1852.56
October 28, 1935 Retort	57.67	52.54	722¼	1328.14	233	65	7.96	6.42	1329.68
June 12, 1936 Retort	7.72	6.52	661-3/4	150.99	300	44	.86	1.64	150.21
July 20, 1936 Bar	27.73	27.50	711½	684.81	231	44	2.79	3.95	683.65
July 29, 1936 Retort	29.93	26.53	656¼	609.35	319	44	3.72	3.58	609.49
August 21, 1936 Retort	29.26	26.10	694½	634.41	266	44	3.05	3.63	633.83
September 22, 1936 Retort	52.15	42.30	699	1034.84	265	44	4.93	5.28	1034.49

L. LORE WARTES
L. LORE WARTES

Description of Bullion	WEIGHT - OZS. Before Melting	WEIGHT - OZS. After Melting	GOLD Fineness 1,000ths	GOLD Value Dollars	SILVER Fineness 1,000ths	SILVER ¢ per Fine Oz	SILVER Value Dollars	CHARGES Dollars	NET VALUE Dollars
October 30, 1936 Retort	42.80	40.42	678	959.14	291	44	5.17	5.02	959.29
May 21, 1937 Retort	44.28	41.67	700½	1021.61	264	44	4.84	5.22	1021.23
June 21, 1937 Retort	44.70	42.92	711½	1068.80	253	44	4.77	5.39	1068.18
July 22, 1937 Retort	36.17	32.37	714½	809.48	247	44	3.51	4.31	808.68
August 16, 1937 Retort	15.17	13.98	716	350.32	251	44	1.54	2.44	349.42
August 24, 1937 Retort	27.82	25.55	725-3/4	648.97	249	44	2.80	3.64	648.13
September 9, 1937 Retort	11.54	10.58	715¼	264.84	246	44	1.14	2.08	263.90
September 23, 1937 Retort	11.79	10.80	635½	240.20	225	44	1.07	2.09	239.18
November 12, 1937 Retort	27.30	24.90	717¼	625.06	246	44	2.69	3.56	624.19
July 22, 1938 Retort	8.64	7.31	715	182.91	256	42	.78	1.75	181.94
August 3, 1938 Retort	7.75	6.56	692½	158.97	237	42	.65	1.70	157.92

Description of Bullion	WEIGHT - OZS. Before Melting	WEIGHT - OZS. After Melting	GOLD Fineness 1,000ths	GOLD Value Dollars	SILVER Fineness 1,000ths	SILVER ¢ per Fine Oz	SILVER Value Dollars	CHARGES Dollars	NET VALUE Dollars
August 23, 1938 Retort	15.29	12.85	723	325.15	240	42	1.29	2.32	324.12
September 14, 1938 Retort	12.29	9.15	705	225.75	241	42	.92	2.97	223.70
November 2, 1938 Retort	8.68	7.83	678	185.78	288	42	.94	1.77	184.95
December 2, 1938 Retort	55.96	51.73	702-3/4	1272.35	267	42	5.80	6.25	1271.90
September 15, 1939 Retort	9.90	9.22	655-3/4	211.61	250	34	.78	1.94	210.45
October 17, 1939 Retort	13.65	12.38	712-3/4	308.80	249	34	1.05	2.27	307.58
December 29, 1939 Retort	15.44	12.53	664½	291.41	274	34	1.17	2.29	290.29
May 13, 1940 Retort	11.69	9.84	704½	242.62	242	34	.81	2.05	241.38
May 31, 1940 Amalcks.	6.70	6.13	667½	143.18	267½	34	.55	1.64	142.09

L. LORE WARTES

L. LORE WARTES

March 29, 1944

Mr. S. H. Lorain,
Box 403,
Moscow, Idaho.

Re: Gold-tungsten ore from Shamrock Mine, Idaho County, Idaho

Dear Mr. Lorain:

The following information and attached data sheets cover testing requested on a sample of tungsten bearing gold ore from the Shamrock Mine, Idaho County, Idaho. Object of testing was to determine methods of recovering the variable tungsten content in the ore. A mill now operating intermittently on the property has a ball mill in closed circuit with jig and classifier followed by amalgamating plates and a table for recovery of gold.

A representative head sample assayed 0.24 ounce Au, 0.20 ounce Ag, 0.50 percent WO_3, and 90.5 percent SiO_2. Mineralogically, the ore may be classified as quartz in which sporadic grains of scheelite, pyrite, iron oxide, orthoclase, magnetite, muscovite and gold are disseminated. Scheelite occurs sporadically along fracture and cleavage planes and has a maximum grain size of 48-mesh, varying down to 560-mesh. Associated with scheelite along the fracture and cleavage planes are pyrite and native gold. Hence, fine grinding of the ore is indicated to obtain appreciable liberation of both scheelite and gold.

Tabling tests were run at 48- and 65-mesh grinds to determine if satisfactory tungsten recoveries could be obtained by this method since a table is available in the present mill circuit. However, owing to the fine grinding required, consequent slime losses and inefficiency of tabling fine material, only 50-65 percent recovery of tungsten was obtained by this method in low-grade 30-40 percent WO_3 products. Microscopic examination of table concentrates revealed numerous quartz-scheelite middling particles. Hence, finer grinding and flotation were investigated.

Selective flotation of minus 100-mesh ore recovered 95.6 percent of the gold in a pyrite concentrate and 65.4 percent of the tungsten in a 52.3 percent WO_3 product. A small amount of magnetite was removed from the final tungsten concentrate by wet magnetic separation. Approximately 83 percent of the total gold was recovered from the gold-pyrite concentrate by amalgamation.

Summary

Fatty acid flotation of scheelite after removing the small sulfide content of the ore by flotation appears to be the most promising method of tungsten recovery. However, fine grinding is required for liberation of the scheelite and high recoveries of tungsten in a premium grade product should not be expected.

A tentative flow sheet for Shamrock ore using present mill equipment is attached.

No further work is planned at this time and if additional information is required, please advise.

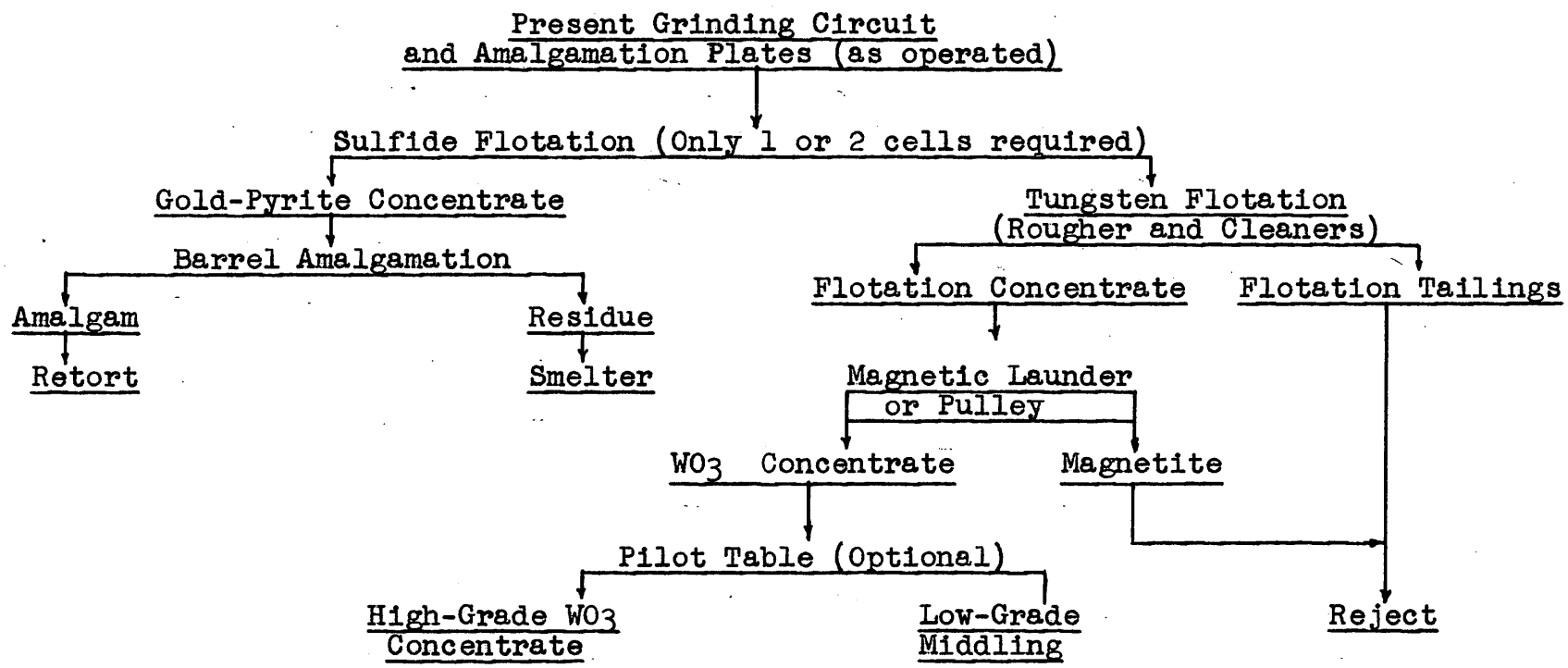
Very truly yours,

H. G. Poole

Enclosure.

L. LORE WARTES

Tentative Flow Sheet for Recovering Tungsten from Shamrock Ore



L. LORE WARTES

U. S. Bureau of Mines
Western Region
Ore Dressing Report

Date 2-29-44

Ore Id-25.1. Shamrock Class Gold-tungsten Source Idaho County, Idaho

Owners No information submitted.

District Engineer's Remarks Suggest a suitable flow sheet to recover scheelite and gold from the ore. Present mill contains ball mill, jig, classifier, plates, and Wilfley table. S. H. Lorain.

Physical Character Ore is mostly quartz with sporadic grains of scheelite, pyrite, iron oxide, and gold.

Chemical Character

Assay, Percent															
	Oz./Ton														
WO_3	Au	Ag	SiO_2	Insol	Fe	CaO	S	Al_2O_3	MgO	Cu	Pb	Zn	BeO	MoS_2
0.50	.24	.20	90.5	96.6	1.15	0.6	0.05	1.05	0.25	0.02	.05	Nil	Nil	.01

Treatment Procedures 1) Tabling.
2) Flotation.

L. LORE WARTES
L. LORE WARTES

U. S. Bureau of Mines
Western Region
Ore Dressing Report

Date Feb. 1, 1944

Test Number Z-12063-A

Ore Id-25.1. Shamrock Class Gold-tungsten

Treatment Minus 10-mesh ore was stage ground through 48-mesh, hydraulically sized and tabled. A small amount of magnetite was removed from table concentrate that was then amalgamated to remove free gold prior to assaying.

Metallurgical Data

Product	Assay No.	Grams Wt.	% Wt.	Assay, Percent WO_3	Assay, Percent Fe	Assay, Percent SiO_2	Oz./Ton Au	Oz./Ton Ag	Weight Milligrams Au	Weight Milligrams Ag	Distribution, % WO_3	Distribution, % Au	Distribution, % Ag
Amalgam	27370	--	--	--	--	--	--	--	18.04	10.7	--	60.6	30.2
Table Conct.	27370	45.9	1.07	31.22	4.2	42.6	4.66	4.4	--	--	65.6	24.6	19.5
Magnetic Reject	27415	5.6	0.13	--*	--*	--	Tr.	1.05	--	--	--	--	.6
Table Midd.	27416	68.4	1.59	0.68	0.65	--	0.16	0.44	--	--	2.1	1.3	2.9
Table Tail.	27417	3886.	90.25	0.14	0.40	--	0.028	0.10	--	--	24.8	12.5	37.5
Table Slime	27418	300.	6.96	0.55	1.95	--	0.030	0.32	--	--	7.5	1.0	9.3
Calc. Heads		4305.9	100.0	0.51	--	--	0.20	0.24	--	--	100.0	100.0	100.0

*Not enough pulp for complete assay.

Test Engineer R. Havens

L. LORE WARTES
L. LORE WARTES

U. S. Bureau of Mines
Western Region
Ore Dressing Report

Date Feb. 11, 1943

Test Number Z-12063-C

Ore Id-25.1. Shamrock Class Gold-tungsten

Treatment Minus 10-mesh ore stage ground through 65-mesh, hydraulically sized and tabled. Final concentrate middlings magnetically separated to remove small amount of magnetite. Table concentrate amalgamated to remove free gold prior to assaying.

Metallurgical Data

Product	Assay No.	Grams Wt.	% Wt.	Assay, Percent WO3	Fe	Pb	Mo	Oz./Ton Au	Ag	Weight Milligrams Au	Ag	Distribution, % WO3	Au	Ag
Amalgam	28422	--	--	--	--	--	--	--	--	35.4	19.6	--	68.1	33.1
Table Conct.	28422	45.3	.57	40.68	5.30	0.1	.01	6.26	5.4	--	--	48.4	18.7	14.2
Table Midd.	28546	15.8	.20	15.10	3.20	--	--	2.00	2.2	--	--	6.3	2.1	2.0
Magnetic Reject	28582	9.5	.12	--*	--*	--	--	0.12	.20	--	--	--	.1	0.1
Table Tail.	28547	6955.	87.75	0.18	0.50	--	--	0.022	.10	--	--	33.0	10.0	40.2
Table Slime	28548	900.	11.36	0.52	1.95	--	--	0.017	.20	--	--	12.3	1.0	10.4
Calc. Heads		7925.6	100.00	0.48	--	--	--	0.19	.22	--	--	100.0	100.0	100.0

Remarks *Not enough sample for complete assay. See attached microscopic report.

Test Engineer R. Havens

L. LORE WARTES
L. LORE WARTES

Supplementary Microscopic Report

Date 2-18-44

Ore No. Id-25.1

Product Test No. Z-12063-C - Table concentrate, middling, tailing, slime and magnetic reject.

Requirements Is scheelite free in these products?

Richard Havens
Test Engineer

Results of Microscopic Examination

Table Concentrate -- Considerable scheelite present as middlings. Quartz scheelite grains have some inclusions of magnetite.

Table Middling -- No liberated scheelite.

Magnetic Reject -- No scheelite.

Table Tailing -- Sporadic middling grains of scheelite.

Table Slime -- No scheelite identified.

By LaMar Evans
Microscopist

2-29-44
Date

U. S. Bureau of Mines
Western Region
Ore Dressing Report

Date Feb. 16, 1944

Test Number Z-12063-D

Ore Id-25.1. Shamrock Class Gold-tungsten

Treatment Minus 10-mesh ore was stage ground through 100-mesh and selectively floated to remove a gold-pyrite concentrate and a scheelite rougher concentrate. Small amount of magnetite removed from tungsten rougher concentrate (wet separation) and the concentrate then cleaned and recleaned by flotation. Gold-pyrite concentrate was amalgamated to remove free gold prior to assay.

Metallurgical Data

Product	Assay No.	Grams Wt.	% Wt.	Assay, Percent				Oz./Ton		Weight Milligrams		Distribution, %		
				WO_3	Fe	Pb	Mo	Au	Ag	Au	Ag	WO_3	Au	Ag
Amalgam	28443	--	--	--	--	--	--	--	--	19.0	10.5	--	83.0	35.0
Gold-pyrite conct.	28443	40.0	1.13	.72	8.60	0.4	.03	2.10	5.1	--	--	1.7	12.6	23.3
Scheelite Flot. Conct.	28549	21.4	.60	52.45	1.600	--	--	0.18	.50	--	--	65.4	.6	1.2
Cleaner Tail.	28550	44.0	1.24	3.22	2.70	--	--	0.04	.24	--	--	6.9	.3	1.2
Rougher Tail.	28551	3440.	97.02	0.13	0.80	--	--	0.007	.10	--	--	26.0	3.5	39.3
Magnetic Reject	--	2.3	.01	--*	--*	--	--	--*	--*	--	--	--	--	--
Calc. Heads		3547.7	100.00	.48	--	--	--	0.19	0.15	--	--	100.0	100.0	100.0

Remarks *Not enough magnetic material for assay. See attached microscopic report.

Test engineer R. Havens

L. LORE WARTES
L. LORE WARTES

Supplementary Microscopic Report

Date 2-18-44

Ore No. Id-25.1

Product Test No. Z-12063-D - Gold-pyrite concentrate, scheelite concentrate, magnetic reject, scheelite cleaner tailings, rougher tailing.

Requirements Is the scheelite free in these products?

Richard Havens
Test Engineer

Results of Microscopic Examination

Gold-pyrite concentrate	- No scheelite.
Scheelite concentrate	- Scheelite mostly free although some quartz scheelite middlings are present.
Magnetic reject	- No scheelite.
Scheelite cleaner tailings	- Quite a little quartz scheelite middlings. Also fine quartz.
Rougher tailings	- Sporadic grains of quartz- scheelite middling grains.

LaMar Evans
Microscopist

2-29-44
Date

April 24, 1944

Mr. S. H. Lorain,
Box 403,
Moscow, Idaho.

Re: Shamrock Mine,
Idaho County, Idaho.

Attention: Mr. L. E. Shaffer

Dear Mr. Lorain:

Reagent data were inadvertently omitted from the report on the above property dated March 29. Enclosed please find two copies of the missing table which should be attached to the sheet for Test Number Z-12063-D.

Thank you for calling this to our attention.

Very truly yours,

H. G. Poole.

Enclosure.

- - - - - - - - - - - -

U. S. Bureau of Mines
Western Region
Ore Dressing Report Date 2-16-44

Test No. Z-12063-D

Ore Id-25.1. Shamrock Class Gold-tungsten

Reagents, Pounds Per Ton of Heads

Reagent	Gold-Pyrite Float	Scheelite Float Rougher	Scheelite Float Cleaners
Z-6	.085	—	—
B-23	.017	—	—
Am. Cy 242	.068	—	—
Na_2SiO_3	—	1.58	0.79
Na_2CO_3	—	1.69	0.85
Oleic Acid*	—	1.48	—
Emulsol X-1*		0.30	—

*Added as water emulsion.

R E P O R T

ON

SHAMROCK MINE

FALL CREEK, IDAHO COUNTY
I D A H O

BY

A. G. KIRBY

PROPERTY This property formerly known for a long period as the NEW YORK mine, but now known as the SHAMROCK consists of five full claims and a fraction located as the SHAMROCK No.s 1-2-3-4-5 & 6, containing approximately 115 acres more or less, the title to which is now held by location. These claims are located so as to cover two known ore veins that pass through the locations. The vein system on which, in the past, major operations have been carried on has a general strike of N 5 E., and is known as the Shamrock vein. The other vein has a strike of NW - SE and is known as the Ontario vein.

LOCATION The claims are situated in Sec 24, Tshp 29 N, Ra7 E, Boise B & M, Idaho County, Idaho, 24 miles east of the town of Grangeville, the county seat of Idaho County, and are reached from Grangeville over a State Highway along the south fork of the Clearwater River to Fall Creek, a small settlement 2 miles east of Golden.

ACCESSIBILITY The State Highway from Grangeville to Elk City passes through the settlement of Fall Creek. Is an excellent road, and I am informed is kept open throughout the winter season by the State Highway Department. Auto stages carrying mail, passengers and freight make the round trip daily with the exception of Sundays. From Fall Creek a fair mountain road extends north to the property, a distance of 4 1/2 miles and at an elevation of 1500 feet above the river at Fall Creek; or about 4,600 feet above sea level. During the summer months autos and trucks readily negotiate the grades between Fall Creek and the mine. During three or four of the winter months a caterpillar tractor would be required to keep the road open from the mine to Fall Creek for the transportation of material and supplies should the same be required.

TOPOGRAPHY The country adjacent to the Clearwater River for a considerable distance east and west of Fall Creek rises precipitously from the river to an elevation of over 5500 feet at a distance of three or four miles back from the river. Beyond this distance to the north the terrain is less precipitous and assumes a plateau nature. The areas adjacent to the river has been deeply

eroded into deep stream canyons. This condition renders the back areas from the river somewhat difficult of approach for a few miles from the Highway, however the alluvial nature of the terrain renders the building of roads comparatively easy along the flanks of the projecting ridges, although somewhat torturous.

ECONOMICS The general situation economically at the mine and applicable to its actual operation is very favorable topographically. The headwaters of Fall Creek originate in the higher plateau region to the northwest of the mine and enters Fall Creek canyon a short distance northwest of the mine workings and approximately at an elevation of 300 feet above the present mill, the upper portion of the latter being on a level with the portal of the No.1 tunnel. The creek water passing under the southwest corner of the mill. At the time of my visit a flow of approximately 2 second feet of water was passing down Fall Creek at the mill. This I was informed was about the lowest stage of water. This amount would be sufficient to develope 50 horse power with a well installed plant and would be available until mid-October. It would also appear that by the construction of a comparatively low head dam a short distance above the present penstock sufficient water could be stored to carry a moderate load through a portion of the low water period. This feature of the water power situation was not checked by actual survey, however. Also by extending the present pipe line below the mill down Fall Creek the present effective head could be doubled over that now being utilized at present.

Economical and foresighted operation and development of the mine would suggest that both mill and power plant be located several hundred feet farther down Fall Creek below the present mill site. The water supply is at present ample for domestic and metallurgical purposes throughout the year, and for power purposes about one-half of the year.

Ample timber is available for all purposes whether for mine timber, construction purposes, or fuel.

I am also advised that ample efficient labor is available locally in the district for all requirements.

EQUIPMENT

CAMP The present camp buildings are situated about one mile east of the mine and mill buildings and consists of one large building used as boarding house and sleeping quarters, and one smaller building also used as a bunkhouse. Both of these buildings are of log construction and are sufficient to accommodate 18 or 20 men. They are also in need of considerable repairs to render them properly habitable. (Burned down 12-21-41).

MINE & MILL BUILDINGS These buildings are of log frame and lumber construction, and consist of mill, blacksmith shop and open timber shed. The blacksmith shop equipment consists of a minimum of tools for drill sharpening only and is insufficient.

The mill building is a framed log and lumber construction located about 100 feet west of the portal of the No.1 tunnel through which latter the ore is trammed direct to the mill ore bins. The mill equipment consists of a 4' x 10' steel bar grizzley, one 10" x 16" Blake type crusher, one battery of five 1200 Lb stamps, and two 56" x 48" silver plated copper amalgamating plates. No form of concentration; or recovery of the sulphide content of the ore is being used.

POWER PLANT The power plant consists of one five foot Pelton water wheel and a Buick automobile engine. The latter being used as auxiliary power during the low stage of water. The water from Fall Creek is diverted to the water wheel through several hundred feet of steel pipe and utilized under an approximate vertical head of 250 feet.

The whole of the mill equipment is limited in its scope, poorly arranged and very much in need of repairs.

GEOLOGY The general area formation in the vicinity of Fall Creek consists almost wholely of Gneiss on the south side of the Clearwater River for a considerable distance east and west of Fall Creek, and on the north side Quartzite predominates with comparatively narrow belts of Gneiss. The Clearwater River having apparently erroded its bed in the breccia of the contact zone of the batholitic mass of Gneiss lying south of the river and the Quartzite to the north. The extensive fissuring and faulting in the Quartzite is due to the pressure of the intruding mass of Gneiss to the south and later injections of igneous dikes; mostly andesitic, into the Quartzite formation. The mineralization in the latter would appear to be occurring in the Shamrock vein adjacent to the intersection of an andesitic dike with the primary vein fissuring. These dikes usually cut the veins at an acute angle and appear to have been intruded later than the quartz veins and their mineralization, the latter having been impregnated into the footwall zone of, and away from, the vein fissures.

At the Lone Pine mine at Golden, situated about three miles south of the Shamrock (or NEW YORK) mine, the ore bodies in the Quartzite are being mined 200 feet below the river level a few hundred feet north of the Gneiss-Quartzite contact and about 1700 feet below the lowest workings of the Shamrock mine. The surrounding conditions therefore indicate that mineralization is fairly deep seated and that an additional depth of ore of from 1,000 to 1,200 feet, at least, may be expected.

MINERALOGY The valuable metal constituent of the ore of the Shamrock mine consists almost entirely of gold, and that apparently in a free state. At least that is the conclusion to be drawn from past operating production results. From 80% to 90% of the values recovered in the past has been in the form of gold amalgam. Only the crudest form of concentration has been attempted at any time in the past operations. Such sulphide minerals that have been recovered has contained small amounts of silver, arsenical and antimonal sulphide. The predominant base mineral content, however, is iron pyrite. Analysis of past concentrate shipment returns indicate that but 2.62% of the total values recovered were contained in such concentrates. No factual data is available to indicate the extent of the gold losses in the tailings or in what form such losses may have occurred.

DEVELOPMENT

A Brunton survey has been made of the No.1 -2 - 3 levels and adjacent areas. The levels and workings above the No.3 level if not entirely inaccessible are almost so and not open to survey at this time. This Brunton survey, while only approximately correct, is sufficiently close for the present and is herewith attached.

The development to date from the time of its original discovery has been by short crosscut and adit tunnels commencing near the apex of the ridge through which the Shamrock vein passes with a north-south strike, and continuing down the hill to the lower, or No.1 tunnel at the mill. The Noll tunnel being near the apex of the ridge. At these upper workings the vein outcropped on or near the surface down to near the No.3 tunnel. In the latter the vein is intercepted by the crosscut 23 feet from the portal.

The No.1 tunnel has been driven a distance of 220 feet in a northwest direction. At a point 106 feet from the portal, where the quartzite was highly silicified a drift on the strike of the formation, and approximately due north, has been driven a distance of 212 feet. Along the major portion of this distance the vein material was comparatively barren until Station No.6 was reached, and some gold values encountered. To the north of this point four raises had been driven into the roof and ore encountered a short distance above the drift. This ore is now being stoped between the No.1 and No.2 levels. Several pillars and blocks of ore are now being left in this area as being too low grade, or refractory, to treat at this time with the treatment facilities available. Ore is also in place at several points in the faces of the northerly workings.

There is no ore at present in evidence in the lower level. This I attribute to the fact that the drift has been driven in a "horse" of quartzite away from the hanging wall fissure; the

ore having passed over the back of the drift and will again be encountered by drifting slightly easterly from Station No.8.

Just how completely the ore has been removed from above the No.3 tunnel to the surface it is at this time hard to determine. It is quite probable; judging from the grade of ore that it is reported to have been mined; much of which at that time was transported to Salt Lake City for treatment, and the lack of suitable treatment facilities for the treatment of a lower grade of material, that much of the lower grade ore were left in the stopes and unmined which, under present day conditions and proper equipment provided could be treated with a good margin of profit.

PRODUCTION

It is very apparent that up until the present time that the mine has been operated as an "high grading" proposition with haphazard search for the higher grade portions of the ore and the extraction of the same without any systematic method of mining. This has resulted in high development costs, with a low and intermittent tonnage production.

No record of the mine production prior to 1934 is extant in tangible form. Since that date the record of production as substantiated by mint and smelter returns is fairly complete, but not entirely so. The tabulated record of such production that has been made; commencing with 1934 up until date is as follows:

AMALGAM SPONGE TO U S MINT

DATE	TONS OF ORE MILLED	NET WEIGHT GOLD FINE OUNCES	NET VALUE PER TON ORE	GROSS VALUE
1934	1,000	376.16	$ 8.65	$ 8,624.98
1935	427	569.69	58.68	25,054.95
1935		517.24		
1936	340	169.37	11.93	4,070.96
1937	585	177.87	7.52	4,398.71
Total	2,352	1,293.09	17.91	42,149.60

Note: U S Mint receipts were found for an additional 517/24 Ozs of amalgam sponge were found, but no settlement sheets for the same. On basis of above average returns for other shipments this would have added an additional amount of $16,872.02.

ORE RESERVES

At this time the ore reserves consists of an indeterminate tonnage of unmined pillars and irregular blocks of ore, and rejected fills in the old stoped areas. The aggregate tonnage of this material distributed about the mine is quite large. There is also a considerable tonnage of material on the dumps above the No.7 tunnel. Grab samples of this material indicates a value of from $6.00 to $8.00 per ton. From the grade of the ore that has been removed from these workings; particularly the area between the No.1 and No.2 levels, it is reasonable to expect that it would equal in value the ore mined and treated during the past year of 1937; or $7.52 per ton.

The stoped area from which the ore has been mined and partially removed extends from the No.1 level to near the apex of the ridge, and inclin distance on the dip of the vein of 500 feet and a lineal distance of from 80 to 150 feet, with an average width of approximately 4 feet, or a cubic content of about 18,000 tons. Of this amount 2,400 tons has been accounted for in milling and shipping operations during the past four years, and that approximately 7,000 tons of pillars and fills now remain in the old stope between the No.1 and No.3 levels.

Owing to the present condition of the upper levels above the No. 3 it is impossible to determine to what extent the ore has been removed in this area. It would be my opinion, however, that due to the greater difficulties of transportation and treatment in the earlier periods of the mine's operation that more selective methods would have been practiced and a less volumne of the lower grade material broken than has been the case during the years immediately under review.

SAMPLES

Description of Sample	Width in inches	Gold Ozs	Value Per Ton
North side of stope below second level.	42"	0.24	$ 8.40
North side of stope between 1st and 2nd levels upper half	18"	1.29	45.15
General grab of stope fill between 1st & 2nd levels		0.22	7.70
Entrance to drift north in quartzite	60"	0.01	0.35
Quartz streak H Wall, north end of stope at 2nd level	9"	11.02	38 5.70
Footwall below No.3 Stn. Gen sample		0.01	0.35
North side of face of stope between Stn' 4& 5	24"	0.82	28.70

R E M A R K S

The topography of the terrain in which the Shamrock veins are situated is eminently well suited for the further and easy development of the veins, also the transportation and metallurgical treatment of the ores. The veins dipping at an approximate angle of 30 degrees easterly and the general slope of the terrain at a slightly more obtuse angle to the south; thus rendering the veins accessible for development by comparatively short crosscut tunnels from the south east to a further depth below the present lowest workings of several hundred feet. There is ample water power available for all purposes for a considerable portion of the year without cost, except for equipment to utilize the same, these water rights being owned by the property.

The values contained in the ore are largely in the form of free gold and recoverable by amalgamation, therefore can be disposed of to the U S Mint as bullion. It is my opinion that experiments will demonstrate that much of the gold that has been lost in the residues, and for the saving of which some form of concentration is now recommended, can also be largely recovered as bullion by the introduction of cyanide treatment.

There is ample timber on, and adjacent to the property for all purposes, and therefore supplies, and freight on the same, can be reduced to a minimum.

At the present time there is no indication that the ore has discontinued either latterally or in depth. Predicated on its geological position and its economical situation the mine justifies further serious development with excellent possibilities of success.

RECOMMENDATIONS.

For the further exploration and development of the property I would make the following recommendations as being essential for the carrying on of this work.

1. The establishment of an assaying plant and a thorough sampling of the mine. That a survey be made of the same and that all sample points and assay values be placed on the maps of the workings as the maps are made.

2. The No. 1 tunnel drift should be driven ahead to the northeast to delimit the present ore shoot in that direction, and ultimately intersect the Ontario vein that is striking into the Shamrock vein from the east. Also prove the downward extension of the latter vein below the No. 1 tunnel level. Primarily the No. 1 tunnel drift to the north should be corrected for direction and the vein located at this horizon. This would appear to be most quickly accomplished

by turning N-E from St'n No.8. The location of the vein at the No.1 level horizon and its immediate extension below that level would be sufficient justification for the commencement of a crosscut adit one hundred, or one hundred and fifty feet below the present No.1 tunnel.

3. Before undertaking any material changes in the present stamp mill and its equipment a large sample of "run of mine" ore should be taken and a series of experiments should be carried out to determine the best method of treatment for the ore. Having determined the latter the mill should be over-hauled and re-equipped as indicated by the data obtained in such experiments. In any event larger primary crushing equipment should be installed. Also larger capacity of mill ore bins ahead of batteries. If present batteries are used chuck plates should be placed in the same to obtain greater final crushing capacity.

4. The present water power pipe line is in bad condition and in need of repairs. It is also inadequate to utilize the full flow of water therefore it might be advisable to consider the replacement of the pipe line by a larger installation.

It is very essential, however, that item No.1 be first carried out and completed as early as possible.

Under the conditions observed and the results that have been obtained in the mine's past operation, I am very confident that favorable results will be secured from its further development and operation if the same are carried out in an efficient and minerlike manner.

Respectfully submitted,

Alfred G. Kirby

Seattle, Wash.
Oct 17th, 1937

R E P O R T

ON

S H A M R O C K M I N E.

FALL CREEK, IDAHO COUNTY
IDAHO.

May 27 - 1940

(Supplementing report of Oct 17 - 1937)

PROPERTY. The Shamrock Mine is located near the settlement of Fall Creek in the TEN MILE DISTRICT, Idaho County, Idaho. It was formerly known as the New York mine and was reported on by me in October 1937 under the latter title.

In my report of the latter date the general physical and geological conditions were set forth, it is therefore not necessary to further enlarge upon these conditions since no material change has taken place by the extension of development or added equipment.

At the time of my first visit the property had been operated by the owner, Mr. H. W. White, who continued to operate the property through the summer months of 1938. In 1939 the property was taken over by lessees who operated the mine thru that year until August when their option was cancelled.

On the 31st of March of this year I arrived on the property for a further examination. This examination showed that very little development had been performed underground since my previous visit. Considerable of the old upper workings, that had been inaccessible at the time of my first visit, had been opened almost to the apex of the ridge on which the claims are located. In addition to the opening up of some of the old workings the operations appear to have been largely confined to the exploitation and treatment of the ores from some of the dumps now lying on the surface. Much of this material is no doubt commercial ore under proper conditions of transport and treatment, but under the conditions existing at the mine at this time such efforts could only result in financial failure with present equipment. This statement will also apply to further actual underground development and the recovery of such ore that is now in evidence or that which may later be developed.

The ore mentioned in the 1937 report as being in sight and available for extraction remains the same at this time. This consists of several ore faces at scattered points in the workings, pillars left for roof support, and a large amount of stope fill that contains commercial ore when removed from

the mine and treated in an efficient and economical manner. As previously stated in my 1937 report;-and this also applies to all future operations that have been carried on up until the present--the mine has been worked solely for its higher grade ores. The lower grade material, together with considerable waste, left as fills in the stopes. This material, plus such ore that may be salvaged from the dumps on the surface, represents the actual ore in sight at this time. The probable ore being represented by the faces of ore in the various workings, the volume of which can only be determined by further development work. The values shown to exist at various faces in the workings are ample justification for the energetic development suggested.

Upon arriving at the property for my recent examination I determined to make some large sample mill tests in order to determine the general average value of the ores from various working faces. To do more than this, and ascertain where the gold value lay in the ore and determine an economical working process for the recovery of the values, was found to be impossible due to lack of facilities, and the dilapidated condition of the mill equipment as it then existed rendered the crushing of ore for sampling purposes both tedious and difficult. However, two small lots of ore were run through the mill consisting of 48 and 51 tons respectively.

As noted in the 1937 report, to which this supplement is attached, the mill on the property consists of a rock breaker, ore bins, 5 stamp battery and two 48" X 56" copper amalgamating plates. The amalgam plates in poor condition, and no method of concentration for base minerals available.

For the purpose of the proposed tests contemplated the amalgam plates were re-set and placed in as good a condition as possible with the time and facilities available. Some makeshift concentration were also provided by the addition of two 4' X 14' stationary tables (or Cornish strakes) covered partially with English Mining cloth and partially with No. 4 Canvas twill over which the ore pulp discharge from the amalgamation plate were allowed to flow. The accumulated sulphides being washed into settling tanks each half hour.

For the purpose of the first mill test a section of the ore shoot for a length of 85 feet and a width of 2½' to 3' were mined from the floor of the No. 1 level on the hanging wall of the vein and immediately below the mined out area between the No. 1 and No. 2 levels above. This consisted of 64 cars of 1500 Lbs. each, or 48 tons, and required 120 hours to run through the mill.

Mill test No. 2. Tons milled. 48.

GOLD CONTENT	Yield By Assay. Au		Yield By Products $		
Mill heads.	0.44 Ozs		$739.20		
Plate Tails.	0.22 "	50%	Bullion -	$242.62	32.5%
Sluice "	0.14 "	18.2%	Concent's	$194.53	26.3%
Loss in Tails ----------		31.8%	-------	$302.05	40.9%

Ratio of concentration 38.4 -- 1.00

Mill Test No. 3. Ore for this test was made up of 51 cars from westerly side of stope between No. 1 and No. 2 levels and 17 cars of old fill from same area; a total of 68 cars or 51 tons of ore milled. Composed largely of oxidized material.

GOLD CONTENT RECOVERED

	By Assay.	%	By Products $		%$
Mill Heads.	0.16 Ozs		$285.60		
Plate Tails.	0.115 "	28.1	Bullion	81.55	28.6
Sluice "	0.04 "	46.9	Con'cts.	128.10	43.8
Lost in Residue.		25.0		75.95	26.6
		100.0%			99.0%

Owing to the large amount of time consumed and the inadequacy of the equipment with which to carry the same out no further experiments were attempted. The results attained, however, are sufficient to show that further experiments should be carried out in detail in order to demonstrate a suitable process for the recovery of the values contained in the ore, and also, if possible, to recover the same in the form of bullion on the ground in order to avoid the high freight rates, haulage charges, smelter discounts and smelting cost on the large bulk of the product that would have to be shipped under the usual amalgamation and concentration method to smelters for benefication of this product, and I do not think that the higher more refined concentration by flotation will prove satisfactory in the amelioration of the conditions complained of above, or that of further reducing the high tailing losses indicated in the two indecisive tests tabulated.

From my observations, however, I am of the opinion that treatment of the ores by amalgamation, followed by comparatively fine grinding in a ball mill, and treatment by cyanidation, will be satisfactory for the elimination to a very large degree of

the excessive costs and difficulties above referred to. This opinion, however, has not been verified by any experimental work on my part and I cannot offer any figures to support such an opinion. I am convinced that an assay office and laboratory is one of the most essential things needed on the mine, not only for the experimental work that should be carried on before undertaking the erection of a treatment plant, but also for the thorough sampling and surveying the mine. The latter also being absolutely necessary for the further intelligent development of the mine. The latter having to be commenced and vigorously carried forward before any extensive treatment plant for the ore will be needed. As indicated in my previous report; the ore at that time, and also at the present, that can be classified as "ORE IN SIGHT" are the stope fills and such ore that can be salvaged from the old workings from the No. 1 level at the mill to the No. 11 level, or surface, at the apex of the hill. While I have not done any sampling in the mine above the No. 3 level, I have no doubt but that a large amount of commercial ore can be salvaged from all of these workings. Here again economical means of salvaging this ore from the upper levels and transporting the same to the mill will have to be provided for in order to avoid a large amount of hand labor and numerous transfers. The past operations have not been conducive to the establishment of ore reserves, hence none exist. Observations of the workings underground indicate at several points that further active development could be expected to again quickly encounter further ore bodies.

ECONOMIC CONDITIONS

The economic conditions for low cost mining and milling are exceptionally good. The vein fissuring have a dip to the Southeast of approximately 30 degrees. The surface terrain also slopes in the same direction at from 20 to 25 degrees, rendering the development of the vein system possible by a series of comparatively short cross-cut tunnels for an additional depth of several hundred feet.

The mine has water rights at the head of Fall Creek and there is ample water for all metallurgical and domestic purposes the year around, and for power development purposes during a good portion of the year. At the time of my leaving the mine on May 20th, 1940 there were sufficient water flowing past the millsite to develop 300 horse power. This volume of power could be greatly increased by the extension of the present pipe line five or six hundred feet down Fall Creek, and, so far as I know, there are no obstacles to extending the pipe line and erection of a power plant several hundred feet down Fall Creek for additional power if desired.

EQUIPMENT

The present power plant consists of about 1,000 feet of steel pipe having an intake of 17 inches in diameter and a discharge diameter immediately ahead of the nozzle of 8 inches, and is operating under a vertical head of 260 feet. The pipe line has been repaired and is now in fair condition. The present Pelton wheel of the power plant needs re-setting.

As stated in my 1937 report, the mill and mine buildings, and general equipment requires a complete over-haul, and in several instances requires replacement; only more so at this time than in 1937. As enumerated in that report it so remains.

REMARKS

While the tabulated mill tests returns are meager and not to be deemed conclusive as to the general tenor of the run of mine ore, they definitely indicate the commercial possibilities of the two classes of ore. That is the unmined ore in place and the rejected fills now lying in the old stopes, if mined and milled in an efficient and economical manner. The short period of test operations and examination also definitely demonstrated the inadequacy of the mining and milling equipment; particularly the latter.

The deficiency of air rock drills, compressed air to operate the same, also tools and subsidiary equipment for mining operations is also very pronounced. No systematic and economical mine development and ore extraction can be carried on with the existing equipment and conditions.

RECOMMENDATIONS

SAMPLING & SURVEYING

(1) As a pre-requisite, and to have first consideration, is the completion of the present assay office building together with sufficient equipment for sampling and assaying, and small scale ore testing purposes.

(2) The present mine workings to be properly sampled and surveyed and mapped together with the surface.

SURFACE PLANT

As a temporary expedient, and in order to utilize the present water power installation, mill building structure, and mine auxiliary facilities for the resumption of operations at the earliest time possible, with the minimum of initial expenditure of funds, I suggest the following:-

(1) That the present mill building be generally repaired and made weather proof for all the year operations.

(2) That the present mortar and stamps be removed and a 10 stamp concrete mortar block be erected on which the present battery and an additional five stamp mortar can be installed with the usual copper plate installation for amalgamation. Or else substitute a 50 ton ball mill (daily capacity) for the stamp batteries with the copper plate amalgamating installation.

(3) A low cost form of commercially effective concentration to be installed below the battery, or tube mill, amalgamating plates for recovery of sulphides and fine gold escaping the amalgamation plates. For this purpose I would suggest a series of stationary tables similar to those used in the two mill tests tabulated in this supplementary report. The first cost of these tables would be low and would only be expected to be used until a suitable process for final maximum recovery had been decided upon. At this time it is anticipated that in the near future it will be found very necessary that a more suitable and economical millsite will be located much farther southeast on Fall Creek to meet the needs of deeper development, and at which point proper and permanent process and equipment can be installed.

(4) A suitable Diesel engine capable of carrying the total mine and mill load should also be installed in order to carry through the period of low water during the fall and winter months.

> Note. The whole of the mechanical equipment enumerated above with the probable exception of the stamp batteries (should the latter be installed) could be salvaged and used at a new millsite should one be located in the future.

MINE DEVELOPMENT

(1) I would suggest that initial development, if undertaken during the period of rehabilitation, be confined to drifting northerly on the hanging wall side of the vein fissuring on the No. 1 tunnel level. Also crosscutting to the northwest, or footwall to delimit the zone of fissuring in which the quartz veins occur, as at no point within the productive area of the mine has the footwall formation been defined to date.

(2) Conditions in the mine at present would render the further development, or salvage of ore, from the productive area above the No. 2 level very difficult, if not economically impossible,

until some means are provided for ore and waste transportation down through the stopes to pockets above the No. 1 level. It is therefore suggested that an incline raise be driven into the footwall from the horizon of the No. 1 level, and conforming to the inclination of the vein ore shoot for the transportation of ore salvaged from the unmined areas and fills above the No. 1 level. This is suggested due to the fact that dip of the vein is too flat for movement of gravity without much shoveling which would greatly increase the cost of salvage.

(3) Present mine conditions also demand that further exploration by further crosscut tunnels at reasonable distances below the present No. 1 tunnel, or mill level, should be commenced as quickly as possible and carried forward energetically to intersect with the downward extension of the Shamrock vein at greater depth.

ESTIMATED COST
OF
Equipment additions, installation, repairs and supplies.

In the following estimates of costs it has been anticipated that much of the material required can be secured second-hand and is based on that presumption.

Assay office & equipment	$ 1,500.00	
Stamp batteries. reset (10)	2,500.00	
Conct. Tables & Bldg.	3,000.00	
Diesel Engine	3,500.00	
Repair Mill Building	1,000.00	
Water Power Repairs	100.00	
Drills & Mine Cars	2,500.00	
Track & Internal haulage eqpt.	1,000.00	
Track, steel, necessary mine tools	2,500.00	
Diesel oil, Gasoline, Lubricants, etc.	3,000.00	
Payroll. 90 days est'd.	15,000.00	$35,600.00

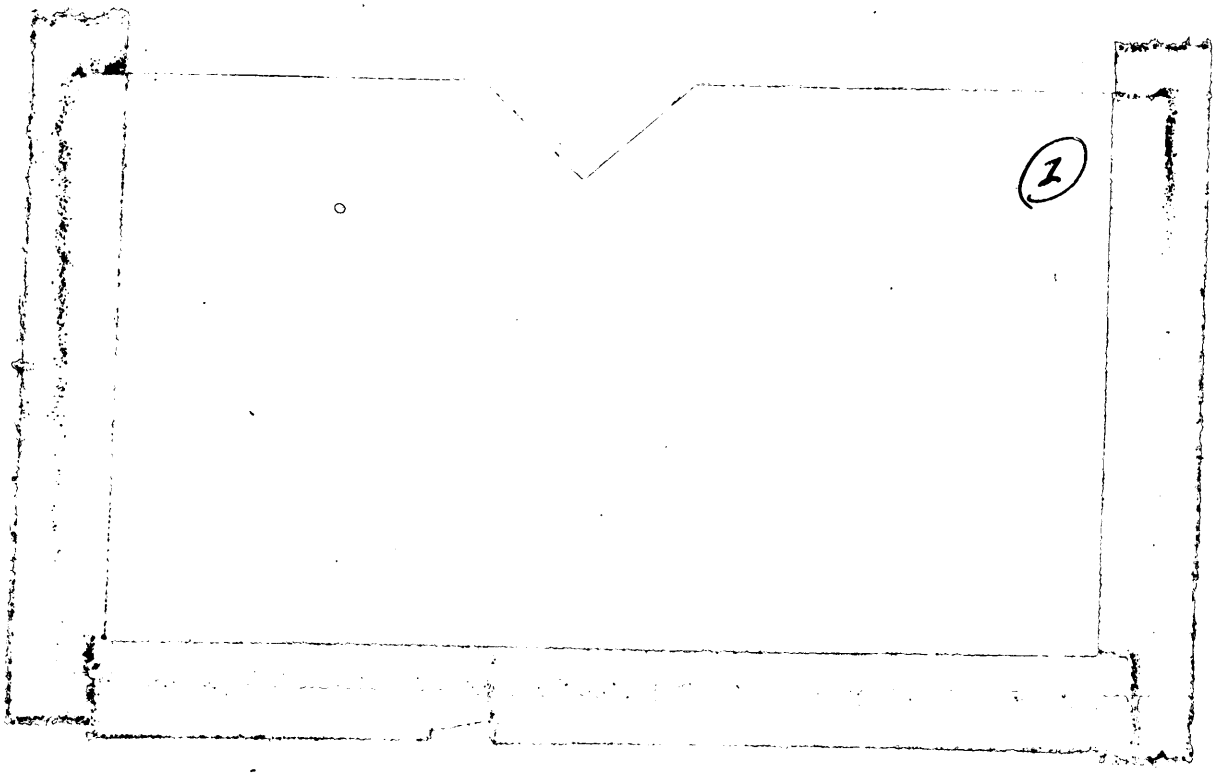
In conclusion I may say that, while no accurate survey and sampling of the mine has been made by me, neither is there any evidence or data available indicating that such has ever been made by others, a study of the existing conditions and the records of production that are now available (and also unrecorded production) together with such sampling that it has been possible for me to do, convinces me that not only is there a large tonnage of commercial ore remaining in place in the areas that have been partially mined, but also that development northerly on the veins will extend the present known ore shoots or encounter others within the boundaries of the property.

The Ontario vein, which has a north-west southeast strike is now opened to the east of the Shamrock vein by the Ontario tunnel, and also opened on the surface at several other places to the east of this tunnel entrance. On its strike to the northwest the Ontario vein will intersect the Shamrock vein to the north of the latters northerly workings. A cut sample on this vein over 28" where cut by the Ontario tunnel gave returns of 0.12 ozs gold per ton. It also assays from $4.00 to $6.00 per ton where it has been opened below the Shamrock camp buildings 2,500 feet easterly from where cut by the Ontario tunnel. Therefore there are good reasons for the continuation of the development on the Shamrock vein into this area, and the expectation of very favorable results at the point of junction of the Shamrock and Ontario veins.

I favorably recommend that Shamrock mine property if properly financed and efficiently operated.

Respectfully submitted

A. G. Kirby.


1