DEFENSE MATERIALS PROCUREMENT AGENCY
WASHINGTON 25, D. C.

Re: DMA-367

DEC 13 1951

Mr. Charles S. Woodward
21 South W. Temple
Salt Lake City, Utah

Dear Mr. Woodward:

In the DMA letter to you of April 19, signed by William Porter Irwin, it was pointed out that part of your application (DMA-367), for Federal aid to explore and develop the Bullshead Mine in Elko County, Nevada, might be eligible for assistance under the exploration program of the Defense Minerals Administration. This program calls for equal participation in exploration costs on the part of the applicant. Explanation of the plan was sent to you at that time.

As we have not received an application from you under the exploration program, we are transferring your original application for a loan to an inactive file. As explained in the letter of April 19, a straight development or mining loan cannot be approved unless there are adequate proven ore reserves to secure the loan, and your application does not indicate such reserves.

If at some future date you should care to explore your property under the Defense Minerals Exploration Administration's program, they will be glad to consider an application from you. We wish to thank you for bringing your property to our attention.

Very truly yours,

Tom Lyon, Director
Program Development Division

GEJOHNSON:pk
12/11/51

cc: Administrator's Files
Mr. Young
Mr. Feiss
Mr. Douglas
Field Team III
Mr. Lyon
Mr. G. E. Johnson
DMPA Files

copy to Lindley 12/17

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED

1984 DEC 17 AM 9:17

SAN FRANCISCO, CALIFORNIA

DEFENSE MATERIALS PROCUREMENT AGENCY
WASHINGTON 25, D. C.

Re: DA-367
Inoex Mining Company
Gullshead mine, Elko Co. Nev.
Direct loan, $90,000
Zinc, lead, copper

Memorandum

To: Reports and Records Unit (Control Center)
Administrative Management Division

From: Lead-Zinc Branch

Subject: Denial of request for loan

Subject docket was originally presented as a request for a direct loan. The proposal involves exploration in whole or in large part, hence when the exploration program was announced, the regulations governing the program and the application forms were sent to the applicant. At that time it was explained to him that his project was ineligible for a direct loan because his reserves were unproven, but might be eligible for an exploration loan under the new program if he cared to submit an application. The applicant failed to reply, hence it can be presumed that he is not interested in matching funds. It is recommended that the attached letter of denial be sent to the applicant so that the docket can be closed.

Returned herewith are:

2 copies RSAB Form 146
2 copies each of Exhibits A-H.
Field memorandum dated May 1, 1951
Letter dated April 19, 1951.

copy to Beasley 10/28

G. E. Johnson,
G. E. Johnson, Acting Chief
Lead-Zinc Branch

Approved:
Tom Lyon
Director, ~~Supply Division~~
Program Development Division

FJLee:emp G 10-18-51
Copies to: H. C. Miller, Region III (2)
Chief, Lead-Zinc Br.
E. T. McKnight 4204 GSA
O. M. Bishop
Directors. r. files 4214 GSA
Br. r. files 4214 GSA

Administrator, Field Adminis.
DMA docket files

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED

DEC 23 AM 8:51

SAN FRANCISCO, CALIFORNIA

May 1, 1951

Memorandum

To: Otto Herres, Chief, Lead-Zinc Branch,
Defense Minerals Administration, Washington, D. C.

From: Executive Officer, DMA Field Team, Region III

Subject: Docket DMA-367, Index Mining Company, Bullshead Mine,
Spruce Mountain Mining District, Elko County, Nevada

Reference is to your subject memorandum dated February 15, requesting an investigation of the possible reserves and a geological examination to determine if the subject property merits consideration under the lead-zinc grant-for-exploration program.

Mr. William P. Irwin, Geologist, U. S. Geological Survey, and Mr. R. R. Trengove, Mining Engineer, Bureau of Mines, visited the property on April 6. At that time, the property was covered by snow and they were unable to make an examination. However, the owner admitted at that time that he did not have any ore in sight, and on April 19 Mr. Irwin wrote Mr. Charles S. Woodward (four copies of his letter dated April 19 attached), suggesting to him that inasmuch as the property does not warrant a development loan, he could possibly qualify for an exploration loan. We have received no word to date from Mr. Woodward indicating his desire to qualify for an exploration loan.

Mr. Ward Smith, Geological Survey representative on Region III Field Team, has endorsed the action taken.

Docket DMA-367 is returned herewith.

H. C. Miller
Executive Officer, DMA Field Team,
Region III

Attachment (Docket file)

Copy to: Ward C. Smith, Geological Survey

HCMiller:am

Files
Chrono

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED
APR 27 1951
SAN FRANCISCO, CALIFORNIA

UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF MINES
P. O. Box 1551
Reno, Nevada

April 25, 1951

Memorandum

To: Mr. H. C. Miller, Regional Director, Region III

From: Chief, Mining Division, Region III

Subject: Docket DMA-367
Index Mining Company
Bullshead Mine
Spruce Mountain Mining District
Elko County, Nevada

Refer to	Noted	Date
Answered		

The complete file on this Docket is returned, herewith.

Mr. Russell R. Trengove of the Mining Division, Region III, and Mr. William P. Irwin of the Geological Survey, visited this property on April 6, 1951. At that time the property was covered by snow and they were unable to make an examination.

However, the owner has admitted that he does not have any ore in sight and inasmuch as Mr. Irwin has written him that his property will not qualify for a development loan, I do not see any necessity for Mr. Trengove to write a report on this property.

Attach copy Irwin letter
WCS. 4/30

A. C. Johnson

A. C. Johnson

Encls.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
102 Old Mint Building
San Francisco 3, California

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED
APR 20 1951
SAN FRANCISCO, CALIFORNIA

April 19, 1951

Subject: DMA-367, Index Mining Company, Bullshead Mine, Spruce Mountain Mining District, Elko Co., Nev.

Refer to	Name	Date
	HBCC	4/20
Answered		

Mr. Charles S. Woodward
21 South W. Temple
Salt Lake City, Utah

Dear Mr. Woodward:

We were disappointed not to have been able to get underground to examine your Bullshead mine in Elko County, Nevada when we visited it recently. We had contemplated returning to make an examination when the snow has melted from the portals; however, if no ore is exposed in the workings, as you report, it will not be possible, even after an examination, to obtain favorable action on your loan request (DMA-367). This is because recent interpretations of the Defense Mineral Act indicate one must have ore in sight and be able to get into production quickly in order to qualify for a development loan. However, you may be able to qualify for an exploration loan.

Recently the Secretary of the Interior has announced a mineral exploration program outlined in the enclosed release (February 20, 1951). Briefly, the Government is offering under this program to give financial assistance for mineral exploration by providing part of the capital required on a loan basis. The Government's share varies with different mineral commodities, but in the case of lead-zinc it is 50 percent. Provision is made for the repayment of the loan out of the funds realized by mining ore discovered by the exploration, and if no ore is discovered the loan need not be repaid.

Your property possibly could qualify for funds for exploration even though it cannot qualify for a direct development loan. If you are interested in providing half of the funds needed to conduct exploration on the Bullshead mine, we will be glad to assist you in modifying your original request to convert it to a request for matching funds for exploration.

Please let me know if you are willing to proceed on this basis.

Sincerely yours,

William Porter Irwin

Enclosure
CC: Otto Herres
H. C. Miller

A. C. Johnson
R. R. Trengove
Ralph J. Roberts

DMA-367
Reading

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED
APR 20 1951
SAN FRANCISCO, CALIFORNIA

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
102 Old Mint Building
San Francisco 3, California

April 19, 1951

Subject: DMA-367 - Bullshead Mine
Elko County, Nevada
DMA-145 - Grand Deposit,
White Pine County, Nevada

Refer to	Noted	Date
	Willy	4/20
Answered		

Mr. Russell Trengove
U. S. Bureau of Mines
P. O. Box 1551
Reno, Nevada

Dear Russ:

Edgar Bailey of this office had a long talk with Mr. Miller this morning. The Bullshead mine was one of the topics under discussion. The enclosed copy of a letter sent to Mr. Woodward, which I believe is self-explanatory, is the result of their conversation.

The principal part of the loan requested by the Grand Deposit Mining Company appears to be subject to the same change of status of exploration loans. Due to this change, my plans to recommend further geological work on the deposit may have to be modified unless the company agrees to foot half of the bill in the event an exploration loan is recommended. Therefore, I am writing to them to determine their attitude toward matching funds for exploration.

Best regards.

Sincerely yours,

William F. Irwin

Enclosure

CC: H. C. Miller
Ralph J. Roberts

REGIONAL DIRECTOR

UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF MINES
1415 U. S. APPRAISERS BLDG.,
630 SANSOME STREET,
SAN FRANCISCO 11, CALIF.

March 28, 1951

Memorandum

To: A. C. Johnson - Reno, Nevada

From: Regional Director, Region III

Subject: DMA Docket 367--Index Mining Company, Bullshead Mine, Spruce Mountain Mining District, Elko County, Nevada

Reference is to your subject memorandum dated March 27. As requested, the complete file of Docket DMA-367 is attached.

You will note that the geological information supplied by the applicant is not in sufficient detail for Washington to make a decision on the loan at this time. It is recommended therefore that we make an examination of the possible reserves and a geological examination to determine if the property merits consideration under the lead-zinc grant-for-exploration program.

Unless we hear that you have no engineer to send on a field trip involving an examination of this property, as well as the Mike Piscovich--DMA-439, Rawhide Tungsten--DMA-474, and Grand Deposit--DMA-145 properties, Ward Smith will have a geologist in Reno Monday morning, April 2. He will send either Porter Irwin or Lorin Clark.

Kindly return Docket DMA-367 with your report.

H. C. Miller
Regional Director, Region III

Attachment (File)

Copy to: Ward Smith, Geological Survey

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED
MAR 28 1951
SAN FRANCISCO, CALIFORNIA

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region III

NEVADA - CALIFORNIA

P. O. Box 1551
Reno, Nevada

Refer to	Notes	Date
	HCM	3/28
Answered.		

March 27, 1951

Memorandum

To: Mr. H. C. Miller, Regional Director, Region III

From: Chief, Mining Division, Region III

Subject: Docket DMA-367—Index Mining Company, Bullshead Mine, Spruce Mountain Mining District, Elko County, Nevada.

Reference is made to copy of your memorandum to Otto Herres, Chief, Lead-Zinc Branch, DMA, Washington, D. C., dated March 26, 1951, on the above captioned subject.

It is suggested that this file be sent to this office so that examination may be made as soon as possible. While it is doubtful when the road into the Spruce Mountain District may be open, it is possible that this examination might be made on the same trip that examination is made of the Mike Piscovich Mine at Ruth, Nevada.

A. C. Johnson

A. C. Johnson

March 26, 1951

Memorandum

To: Otto Herres, Chief, Lead-Zinc Branch, DMA, Washington, D. C.

From: Executive Officer, DMA Field Team, Region III

Subject: Docket DMA-367--Index Mining Company, Bullshead Mine, Spruce Mountain Mining District, Elko County, Nevada

Reference is to your subject memorandum dated February 15 requesting that Region III DMA Field Team have a geological examination made of subject property.

This is to report that no action has been taken to date on this application, as we are awaiting word that the road to the property is open to travel. We assume that it is not yet possible to reach the property, as no report that the property is accessible has been received from our Reno Office.

H. C. MILLER

H. C. Miller
Regional Director, Region III

Copy to: Ward Smith, Geological Survey
A. C. Johnson, Bureau of Mines, Reno

HCMiller:am

Files
Chrono

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED
FEB 2 5 1951
SAN FRANCISCO, CALIFORNIA

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

February 15, 1951

Memorandum

Refer to	Noted	Date
	WCS	2/26
Answered		

Hold a week for batch

To: Executive Officer of Field Team, Region III

From: Lead-Zinc Branch, DMA

Subject: Docket DMA-367
Index Mining Company
Bullshead Mine
Spruce Mountain Mining District
Elko County, Nevada

Mining has been carried on intermittantly in the Spruce Mountain District since 1869, the estimated total value of the production to 1930 was $1,731,000. According to U. C. Hiekes, in the Mineral Resources of the United States, the production from 1902-1912 and from 1916 to 1928 was as follows:

Gold (oz.)	Silver (oz.)	Copper (tons)	Lead (tons)	Zinc (tons)
176	606,274	161	5,039	20

There has been minor production in the district since that time but no totals are available.

The Bullshead mine is on the northeast slope of Spruce Mountain at an altitude of about 7,900 feet. In 1918 a mine report by Herman Davis it was estimated that reserves totaled 10,000 tons of ore averaging 27 oz. of silver, and 3% of lead per ton. In a later report, 1926, by Frank Jardine, it was stated that were 6,000 tons of ore "in sight" of which a block of 4,500 tons averaged 25.74 oz. of silver and 11.2% lead; and 10,000 tons of probable ore. Samples taken from stockpiles in 1927 show an average of 1.7% Zn., 0.7% Cu, 22.1% Pb., and 14.3 oz. Ag.

Since 1927 930 tons of ore has been shipped from the mine.

The applicant requests a loan of $90,000 covering:

2/2/51 Johnson to report. If needs to assume one open. We have a report in our files.

(a) Purchase and installation of equipment..$18,900.00

(b) 2,000 feet tunneling 60,000.00

(c) Repairs to buildings 3,100.00

(d) Office and management..... 8,000.00

The proposal of the applicant is to drive a 2,000 foot tunnel which would cut across "known fissure zones" which are indicated by surface exposures and other mine workings.

The geologic information supplied by the applicant is not in sufficient detail to make a decision on the loan at this time. Therefore, it is recommended that the application be sent to the field for an investigation of the possible reserves and a geologic examination to determine if the property merits consideration under the lead-zinc grant-for-exploration program.

Otto Herres

OTTO HERRES, Chief
Lead-Zinc Branch, DMA

Approved:
DMA Operating Committee

C O Mutterdorf
Acting Chairman

J. H. Hedges
J. H. Hedges

for T. P. Thayer
Olaf N. Rove

February 15, 1951

Re: Docket DMA-367

Mr. Glen A. Finlayson, Vice President
Index Mining Company
21 South West Temple
Salt Lake City, Utah

Dear Mr. Finlayson:

Your application (Docket DMA 367) for a Government loan under the provisions of the Defense Production Act of 1950 has been reviewed by the Lead-Zinc Branch of the Defense Minerals Administration. Before final decision can be taken on your request it will be necessary to obtain additional information on your property. Your application, therefore, has been referred to the appropriate field office with the request that the needed information be supplied to us.

Yours very truly,

S. H. Williston, Director
Supply Division
Defense Minerals Administration

ALBroker:jsh
G-2/15/51

copy to: Chief, Lead-Zinc Branch
Geological Survey - McKnight
J. H. Medges
R. H. Mote
Strobel
Mittenderf
2 copies to Executive Officer,
Regional Field Team, Region III
Files

DMA-367

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

TERMS OF LOAN REQUESTED

DATE OF APPLICATION

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

INDEX MINING COMPANY
21 SOUTH WEST TEMPLE
SALT LAKE CITY, UTAH

TO BE FILLED IN BY DELEGATE AGENCY

(DATE RECEIVED)

COMM.

AGRIC.

INT.

D.T.A.

FILE NO.

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

The purpose of the loan requested, is as follows:

1. To purchase equipment and small truck
2. Extending Reno Annex Tunnel 2,000 feet
3. Repairs to buildings

NATURE OF EXPENDITURE	AMOUNT
1. Purchase and installation of equipment	$18,900.00
2. 2000 feet tunneling	60,000.00
3. Repairs to buildings	3,100.00
4. Office and Management - 2 years	8,000.00
Total amount applied for	$90,000.00

2. PROPOSED METHOD FOR REPAYMENT OF LOAN

State sources of funds, and proposed schedule of repayment

Funds for re-payment of loan can only be made available if and when production of ores is had. Suggest, not to exceed 10% of net smelter returns, after deducting hauling and freight charges.

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.

Extending the Reno Annex Tunnel 2000 feet. To cross-out known fissured zone, so very productive in upper levels of the mine. This proposed work will also cross a limestone-conglomerate quartsite contact which shows considerable copper, lead and silver mineralization.

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?

Current statistics indicate shortages in Zinc, Lead and Copper minerals.

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

Statistics indicate that domestic deposits of above named metals must be found, if our economy is to remain secure. The small mine operator is the medium through which most new deposits are found.

(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.)

May help to provide future national needs.

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?

All war industries need metals

(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.

No

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)

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.)

Mine closed at present

(b) Maximum feasible employment with existing facilities.

(1) Single shift operation.

Mine

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

Two or three shifts

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

9 men can handle job with proposed equipment.

7. Timing

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

April 1, 1951 - Funds for equipment and installation

(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.

Other funds at the rate of $5000.00 per month.

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)

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
			$	
TOTAL	X X X X X X X	X X X X X X	$	X X X X X X X X X X X X X X X X

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 _____

(Insert date of end of fiscal year)

(000.00 omitted)

	(Figures for 3 preceding years)			Current year as of date of Exhibit A
	19	19	19	
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.

EXHIBIT B — CONDENSED COMPARATIVE STATEMENT OF CONDITION

For years ended _____

(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) 19	19	19	Current year as of date of Exhibit A
CURRENT ASSETS:				
1. Cash				
2. Receivables (after deducting reserves)				
3. Inventories				
4. Other current assets:				
TOTAL CURRENT ASSETS				
FIXED AND OTHER ASSETS:				
5. Plant accounts (before depreciation):				
Machinery, equipment, etc.				
Delivery equipment				
Real estate and buildings used in business				
6. Other assets (as investments, real estate not used in business, etc.):				
TOTAL ASSETS				
LIABILITIES				
CURRENT LIABILITIES:				
8. Notes payable				
9. Accounts payable				
10. Accrued liabilities				
11. Other current liabilities:				
TOTAL CURRENT LIABILITIES				
FIXED AND OTHER LIABILITIES:				
12. Mortgage debts				
13. Debentures				
14. Other fixed liabilities:				
RESERVES:				
15. Reserve for depreciation				
16. Other reserves:				
NET WORTH:				
17. Common stock (issued) (if Applicant is incorporated)				
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				

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 _____ (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
None		$	$

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.

Witness: _____ _____

Address of witness: _____ _____

Dated _____, 19____ _____

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 JAN. 4, 1951

Witness: (For individual applicants)

_____ _____ (Signature)

Witness: (For partnership applicants)

_____ _____ (Full name of firm)

By _____ (Signature), a general partner.

(For corporate applicants)

(CORPORATE SEAL)

INDEX MINING ~~COMPANY~~ (Full corporate name of Applicant)

Attest: By _____ (Signature) PRESIDENT (Title)

R. W. Edmunds (Signature), SECRETARY (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

21 SOUTH WEST TEMPLE ST.
SALT LAKE CITY, UTAH

INDEX MINING CO.

SUPPLEMENTAL INFORMATION

From 1885 to 1920, the Old Bullshead Mine at Spruce Mountain, Nevada, was one of the main producers of the district. Three small smelters were erected at different periods to treat the ores, which were taken from very shallow workings. No effort has ever been made to develop this mine at depth. No records are available of this early production. It has been estimated at - from $200,000.00 to $500,000.00.

The principal work done by the Index Mining Company, was the cleaning up the ores left in the old stopes which had not caved and also extending a lower tunnel approximately 900 feet.

There is no equipment on the property at the present time. See exhitib "D" for new equipment required.

The proposed new development tunnel will cross-cut the main fissured zone and also a very highly mineralized contact vein which lays between limestone and quartsite conglomerate. This vein shows considerable copper mineralization on the surface.

It would be difficult to estimate ore tonages that may be developed through the proposed work, but it is possible that a mineral zone will be developed that may produce several hundred tons of ore per day.

The mine is located 17 miles southwesterly from Jasper siding on the Western Pacific R.R. A good dirt road exists from the mine to Jasper. Ores would have to be shipped by rail approximately 180 miles to the Salt Lake Valley Smelters in Utah.

It would require about 18 months to complete the work for which loan is requested.

All maps, engineers reports, records of shipments made etc., available, are enclosed herewith.

The management has had a lifetime experience in the mining business, and assisted in producing over $1,000,000.00 in ores from the Nevada Monarch Mine, which joins the property of Index Mining Company on the West and North.

The property is best reached from Wells, Nevada, located on main U.S. highway 40, thence south to Tobar, Nevada and from Tobar, follow road to S. E. which leads to the East said of Spruce Mountain.

Spruce Mountain Mining District is considered to be one of the most likely un-developed possibilities in the intermountain west, for Silver, Lead, Copper and Zinc ores.

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)

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)
				(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):

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.)

9 men needed for job plus equipment indicated in exhibit.

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

Men needed are available

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

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)*

Farmers State Bank, Woods Cross, Utah
First Security Bank, Salt Lake City, Utah

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.

Loans for mine development not available at banks.

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. The further development of property is only method of determining future financial aid.

13. **HISTORY, MANAGEMENT, LEASED AGREEMENTS, INSURANCE, ETC.**

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.

NAMES & ADDRESSES OF FIVE LARGEST STOCKHOLDERS

		Common Shares
Idaho Birthday Mines Company	21 So. W. Temple Salt Lake City, Utah	200000
Charles S. Woodward	21 South W. Temple Salt Lake City, Utah	150000
Glen A. Finlayson	21 South W. Temple Salt Lake City, Utah	100475
Reginold W. Edmunds	21 South W. Temple Salt Lake City, Utah	164500
Bessie C. Holt	Room 200, 34 So. Main St. Salt Lake City, Utah	100000

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)
Chas. S. Woodward	Pres. (D)	None	$30,000.00	150000		None	
21 S.W. Temple St.							
Salt Lake City, Utah							
Glen A. Finlayson	Vice-Pres.(D)	None	40,000.00	100475		None	
Same Address							
Reginold W. Edmunds	Sec.&Treas. D	None	35,000.00	164500		None	
Same Address							
	Total		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	$	$	$		
Preferred stock	$	$	$		

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)

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:				
To be acquired:				

* 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)

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

INDEX MINING COMPANY

BALANCE SHEET AS OF DECEMBER 31, 1950

ASSETS

Current		
Farmers State Bank	27.31	
Accounts Receivable	575.25	602.56
Mining Claims		46,607.63
Development		
To June 1, 1947	22,685.82	
Expense to March 31, 1949	1,719.09	24,404.91
		71,615.10

LIABILITIES

Accounts Payable			133.23
(Balance due on option on Bullshead Mine, $25,000.00)			
Net Worth			
Common Stock			
Authorized 2,000,000 Shrs. @ 5¢		$100,000.00	
Unissued	614,131 Shrs @ 5¢	30,706.55	
	1,385,869	69,293.45	
Treasury Stock	310,497	15,524.85	
Outstanding	1,075,372	53,768.60	
		53,768.60	
Capital Surplus		17,713.27	71,481.87
			71,615.10

Shares of the Corporation are assessable.

EXHIBIT A - CURRENT FINANCIAL STATEMENT

As of _____

(Date not more than 30 days prior to date of application)

ASSETS

CURRENT ASSETS

1. Cash ..... $ _____
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) _____ _____

TOTAL CURRENT ASSETS ..... $ _____

FIXED AND OTHER ASSETS

6. Plant used in business:
   Land ..... $ _____
   Buildings ..... _____
7. Machinery ..... _____
8. Equipment, furniture, and fixtures ..... _____ $ _____
   Less reserve for depreciation ..... _____ _____
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 ..... $ _____

LIABILITIES

CURRENT LIABILITIES

16. Notes payable (see schedule 1, page 10):
    Banks ..... $ _____
    Trade creditors ..... _____
    Officers, stockholders, relatives ..... _____
    Insurance companies ..... _____ $ _____
17. Accounts payable ..... _____
18. Other current liabilities:
    Delinquent taxes { Real estate ..... $ _____
    Delinquent taxes { Federal ..... _____
    Wages and salaries ..... _____
    Due officers ..... _____
    Accrued interest, rent, taxes, wages, etc ..... _____
    _____ _____ _____

TOTAL CURRENT LIABILITIES ..... $ _____

FIXED AND OTHER LIABILITIES

19. Machinery liens ..... _____
20. Mortgage debts (see schedule 2, page 10) ..... _____
21. Bonds or debentures (see schedule 2, page 10) ..... _____
22. Other liabilities ..... _____

NET WORTH

23. Common stock (if Applicant is incorporated) ..... $ _____
24. Preferred stock (if Applicant is incorporated) ..... _____
25. Surplus (if Applicant is incorporated) ..... _____
26. Capital and Surplus Account (if Applicant is partnership or individual) ..... _____

TOTAL LIABILITIES ..... $ _____

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).

Index Mining Company
21 South W. Temple St.
Salt Lake Ci[illegible]l, Utah

EXHIBIT "E"

PRELIMINARY REPORT OF THE BULLSHEAD PROPERTY * SPRUCE MOUNTAIN, ELKO COUNTY, NEVADA

The Bullshead Property situated on the NE slope of Spruce Mountain the Spruce Mountain Mining District, Elko County, Nevada, 17 miles SW from Jasper, a station on the Western Pacific R.R., main shipping point for the district. Good roads connect the property with Jasper. Trucks now operating carry a load or ore varying from ten to eleven tons.

PROPERTY: consists of 3 patented mining claims, viz: The Scorpion, Friday and Sunday, and 8 unpatented mining claims, viz: The Reno, Reno Annex, South Sunday Annex, South Sunday Annex, South Sunday Extension, Scorpion Annex, South Friday extension, Zone and Compos, Approx. 220 acres.

EQUIPMENT: 1-Sullivan 8x8 Compressor, 1- Fordson 4 Cyl. Engine operates 2 - Cleveland Drills, 1- Blacksmith shop with requisite tools, 1-tool house, 2-Cleveland Drills and air hose, 2000 feet of 2" iron pipe, 6 - mine cars, mining tools sufficient for an operating force of 12 to 15 men. 1000 feet of 8# steel rail, 1- Assay office, 1-50 ton Lead Smelting Plant, 1-25' x55' Boarding house consisting of kitchen, dining room and 2 rooms for cook's quarters, 1-Storage cellar and cool room for provisions and supplies, 5- bunk houses with iron cots, will accommodate 25 men, 1-5 ton United Truck in good condition, purchased this year. Boarding house is furnished with water from spring by pipe line 1500' long. There is another spring on the property that can readily be utilized if the future needs of the property demand additional water.

HISTORY: The first operators of the Bullshead property confined their operations to mining the richest silver ores, and mined product rich enough to be hauled by teams a distance of 60 miles to Wells, Nevada, a station on the Southern Pacific RR, leaving the lower grade silver and silver-lead ores in the mine or on the dumps until such time as their mineral contents could be favorably utilized, either by improved transportation methods or possible milling methods, etc. The building of the Western Pacific Railroad gave the property a shipping point within 17 miles, shortening the haul 43 miles, and the use of high powered trucks has cut haulage costs to a point where a large proportion of the ore exposed in the property can now be profitably mined. While the property has been operated over a period extending back propably 35 years, I have no available records showing the amount of ore production covering this period, which is reported by parties reputed to be conversant with the property to have reached a substantial amount, probably $ 20,000.00. The Geological Survey Mines Report for 1918 says of the three properties shipping ore, produced 480 tons of an average value of $49.52 per ton, the Bullshead and its near neighbor the Black Forest being the principal producers. In 1921 reported as shipped via Jasper. Smelter idle. 1922 the report states that regular shipments of silver ore and lead ore were made from the Bullshead property, which is said to have 10,000 tons of ore in reserve. The average value, which is said to have 10,000 tons of ore in reserve. The average value per ton of ore shipped during the year is given as $44.68. From this point on to the present I have no data covering production record.

FORMATION: Prophry, quartzite, conglomerates, limestone of varying color and alteration, shales.

VEIN SYSTEM: A series of north and south fissures generally dipping westerly slightly, where any dip is noticeable, apparently there are six of more of these north south fissures varying in distance apart from 50' to 500'. The north south fissures are intersected by several east west fissures. The dip of the lime beds vary from the horizontal to 35o pitch, with more or less local folding and varying dip of beds. At points of fissure intersections, as revealed by outcrops and underground development, the mineralization is strengthened, resulting in enlarged ore occurrences making off into the favorable lime beds to an indefinite distance, indicating the occurrence of ore bodies of commercial size and value in mineral content. Mineralization apparently extends from the fissures into three or more of the lime beds, a light colored soluble lime bed, a strongly fractured recemented silicious lime bed and a large altered lime bed of brownish color, the latter being the lower bed.

MINERALIZATION: Manganese carbonates and sulphides, lead-galena, with its various alteration products, anglesites, cerrusites, plumbojarosites, argenites, predominating, iron oxides, silica, no refractory elements in any appreciable quantity. The ore should be desirable smelting product. The great size of the prophoritic dykes and intrusives, together with the strong fissured zone and character of mineralization, force the conclusion that the genesis of this mineralization, is deep seated and that the ore bodies should go to a great depth.

DEVELOPMENT: Consists of approx. 5,000' including tunnels, drifts, winzes, raises, etc. Tunnel No. 1 on the Friday claim, 1,500' workings or more, follows fissures and cuts, several fissure intersections, some drifting off main entry, ore shows throughout the workings. Leasers have at various times shipped ore in pay quantities, also the Company. Main entry follows the fissure designated as manganese fissure. The predominating minerals are manganese and silver with local occurrences of lead. This is the 80' level from surfaces. Probably give backs from 125' to 150' on dip of beds. At one point there is a block of ore practically in sight above the level extending approx. 175' on strike of vein, with probably backs on dip of beds of 125'. Thickness of ore streak 3' allowing 14 cubic feet to the ton indicates upward of 4500 tones of ore in this block. Five samples taken by myself and assayed July 8, 1926 gave the following returns:

No. 2	Gold 0.01	Oz. Silver	42.30	Lead	8.8	
No. 3	0.04		21.60		13.3	
No. 4	Trace		17.90		10.4	
No. 5	0.02		23.40		14.5	
No. 6	Trace		23.70		9.3	gives avr. content
			25.74		11.2	

Reference to assay map shows silver values up to 110 oz. Probable ore tonnage in these workings can reasonably be stated as one and a salf times the amount given in the block of ground herein estimated, or 7,000 tons. These workings explore very favorable area. Tunnel No. 2 on Friday Claim, on 164' level give probably 250' of backs of vein. The main North South Fissures that the workings follow is heavily mineralized and has been a source of considerable ore production. Estimates of positive and probably ore given for the Tunnel No. 1 area can reasonably be enlarged as the ore exposures are as favorable and the workings much more extensive, approx. 3,000'. These workings connexted with the Scorpion Tunnel works by raise 150', following the dip of beds and mineralization, hence it appears conservative to estimate ore in sight as 6,000 tons and probably ore as 10,000 tons. These workings penetrate a favorable area as demonstrated by actual ore exposure. Reference to assay map shows in instances higher values in silver that the Tunnel No. 1 area and higher lead content. Scorpion Tunnel on Scorpion claim, situated about 500' S.W. of Tunnel No. 1 about the 80' level. I did not explore these working thoroughly owing to a portion of them form portal of tunnel being caved in. However, can say the workings generally follow one of the typical N.S. fissures, strongly mineralized and there is a very favorably ore exposure, also the caved portion at the portal of tunnel has exposed an ore streak 4' to 5' thick. These workings would give about the same amount of backs for stoping purposes as the Tunnel No. 1 works. Tunnel No. 3 located on the Sunday claim, 31 7' in, is projected as a cross-cut to cut fissures at depth, probably 307' level. Course West 50' cut N.S. fissures showing some ore in fissure and bunches of galena in the lime beds. 250' point a 12' drift S.W. follows a fault fissure, shows some mineralization, 20' back from tunnel breast a 6" streak of ore is exposed dipping westerly at about 20°pitch. This work is important and should be continued to its objective to cut N.S. fissures and should be continued clear across the fissured zone. This point will make for economical development of the property down to the 300' level and when main fissures are intersected they can be followed on their southerly course, and as advance is made in that direction the available backs for stoping operations will be increasing until at the crest of the mountain they reach a maximum of 1,000'. There are a number of minor surface workings showing ore, adding to the general impressive mineral showings throughout the property, a large tonnage of low grade ore is in the sumps. Haulage charges to shipping point - 17 miles, are not prohibitive - $5.00 to $5.50 per ton. Camp elevation about 6500', favorably located, can operate the year around. I may state, that in my opinion, that the estimate of tonnage and values of ore in sight in Bullshead workings, made in 1919 by Mr. Herman Davis, was a very conservative estimate and that whatever depletion of ore reserves that may have transpired in the interim by mining operations are probably more than made up by ore put in sight by new development.

SUMMARY: Favorable geology, strong fissured zone and evident mineralization, ore exposures over an extensive area of development, together with past history of property and favorable location for operations, leads me to state that the Bullshead property is a property of much merit and its potential possibilities are great with a vigorous operation and continued development, and should result in making a mine of large and profitable operations.

Salt Lake City, Utah
September 14, 1926

Respectfully submitted,

FRANK JARDINE

Salt Lake City, Utah
July 27, 1927

Bullshead Consolidated Mining & Smelting Company
Salt Lake City, Utah

Gentlemen:

Pursuant to your request, I visited the Bullshead and O'Neil mines at Spruce Mountain, Nevada, July 24 and 25, 1927. Since my visit to the property in Sept. 1926, the No. 3 tunnel has been advanced 295 feet and is now in 612 feet. The Tunnel has been rung off of the original course and is probably about 60 ft. south of the original objective line. Advance of present face should be made to the S.W. towards the objective point, which will give about 200 ft. of depth below a very prominent and well mineralized outcropping. Also same depth below No. 2 Tunnel. The face shows some mineralization and the black lime that shows as the footwall lime throughout the No. 2 Tunnel workings, which is a favorable condition. At the 410 ft. point a fractured condition was cut and drift of 25 ft. was driven North 10° West. Ore is making in the bedding and a few tons of ore is mined; reference to Sample No. 1 indicates its value, additional favorable showings occur at the 50ft. and 250 ft. points. Continuation of development on this level should intercept the continuation of ore bodies that occurred throughtout No. 1 and 2 Tunnels on their downward trend. Hence work on this level should be continued.

No. 2 Tunnel: Two headings are being driven at this time at 425 ft. point a drift westerly is in 30 ft. The face showa a crusher silicious lime formation with pockets of ore occurring and appears favorable for ore occurrence. A stop drift is being driven off the Crow Bar drift. It is in 25 feet and followed ore throughout. Ore is being mined from this point and placed in bins for shipment. The area being penetrated lies between two fissures, (the Scorpion, etc. fissures) some 75 ft. apart. This area appears to be particularly favorable for exploitation No. 2 Tunnel should be connected up with No. 1 Tunnel, connection can be made by advancing an E drift, now in 30 ft., an aditional 16 feet and raising 6 feet to connection with 98 ft. winze sunk from No. 1 Tunnel level. This would make the No. 1 Tunnel workings available for mining operation at a nominal cost. It would require the placement of trackage and one car and a chute pocket in raise. Showings through out No. 1 Tunnel appear to justify this improvement, which would make for economical exploitation of the No. 1 Tunnel level.

Three samples were taken which gave results as follows:

	Gold	Silver	Lead	Copper	Insol.	Zinc	Sulph.	Iron
No. 1 Stock Pile No. 3 Tunnel	0.020	20.8	30.5	0.20	14.2	1.6	0.9	8.6
No. 2 Crow Bar Stope Drift	0.010	10.3	22.0	1.6	15.8	1.8	0.3	26.7
No. 3 Stock Pile	0.010	11.9	13.8	0.41	30.4	1.9	0.8	10.8

Mr. Devine informs me that the ore broken and in bins and stock piles at mine and Jasper available for shipment amounts to 125 tons. The bulk of this broken ore, he estimates, will run 20 oz. Silver and 20.0 to 25.0 percent lead, and between 20 and 30 tons much higher as he is mining it from high grade streak which should hold up to 45.0 per cent Lead or better and Silver increase in proportion.

Relative to Josephine Tunnel: advance of 160 ft. would put heading under an old shaft reported to have been the source of production of a substantial tonnage of high grade silver-lead ore.

One heading is being driven on the Grecial Bend Claim and a highgrade Silver-Lead product is being mined and prepared for shipment. The headings now being driven should be containued along the lines suggested to your Mr. Woods while at the mine. Conditions at the property appear very favorable and should respond favorably to further development and result in a profitable operation.

RESPECTFULLY SUBMITTED,

FRANK JARDINE

EXHIBIT "F"

Index Mining Company
[illegible] South W. Temple St.
[illegible]t Lake City, Utah

Report on the

BULLS HEAD MINES

SITUATED IN SPRUCE MOUNTAIN MINING
DISTRICT, ELKO COUNTY NEVADA

BY HERMAN DAVIS OCT. 1918

LOCATION:

This property is located about one and one half miles due east of the summit of Spruce Mountain in Spruce Mountain Mining District, Elko County, Nevada, in the south east quarter of Section 14, Township 31 North, Range 63 East, and the south west quarter of Section 19 Township 31 North, Range 64 east, Mount Diablo Base and Meridian, and on both sides of Scorpion Canon, about one half mile southerly from East Canon Creek, and at the base of Spruce Mountain, and approximately 2500 feet from the old Star King Smelter; at about 114°15' west longitude, and 40° 30' north latitude, at an elevation of 7500 feet.

The mines lie easterly from Elko, Nevada, about 55 miles and due south of Wells, Nevada, 35 miles in an air line. By good wagon and auto raods 43 miles from Wells, 27 miles from Tobar, on the Wertern Pacific, and 21 miles north of Currie; the nearest railroad station is Jasper Siding, on the Western Pacific.

The nearest post office, telephone and telegraph station is Tobar. The roads in this country are excellent for wagon and auto use, and hauling can be done to and from the mine throughout the year.

Being situated in a rich agricultural, sheep and cattle country the necessities of life are purchasable at the lowest prices, and there are no local miners or other unions to distrub the harmoney that should exist between employer and employed.

PROPERTIES:

The properties of the Bulls Head Mining Company consist of the following:

Scorpion	U. S. Patent,	No. 1471	19.68 Acres.
Friday	U. S. Patent,	No. 1470	19.59 Acres.
Belt	U. S. Patent,	No. 1469	19.70 Acres.
Sunday	U. S. Patent,	No. 1472	19.58 Acres.

a total of 78.05 Acres U. S. Patented ground, also:

Scorpion Annex No. 1,	Location.
Scorpion Annex No. 2,	Location.
Sixteen-to One	Location.

approximately thirty three Acres, or a total of one hundred and eleven Acres in this group.

TITLE:

The titles are perfect, and there are no liens or unpaid inbumbrances of any kind or nature against the properties.

CLIMATE:

The climate is mild and equable and offers no obstacle to mining and reduction operations each day of the year.

WATER:

The average rainfall of Spruce Mountain is about 45 inches, chiefly snow. The water coming from the snowfalls on the limes and granites of this high mountain is the purest that can be found for domestic purposes, and also ample for necessary methods of reducing the ores, and the general location one of the most healthy and beautiful to be found in the State.

TOPOGRAPHY:

Spruce Mountain is the highest and most southwesterly peak of the Goshute Range, and reaches an elevation of about 10,411 feet, and rises about 4500 feet above the surrounding valleys. This mountain presents a steep and rugged topography on the west, south and east sides, and commencing at the Bulls Head and Forest Mines on the east and at Sprucemont on the west, the hills rise quite steeply, affording opportunities for cutting the formations at any desired level, and giving excellent backs.

TOPOGRAPHY AND GEOLOGY AT BULLS HEAD MINES:

The topography of the country at the Bulls Head Mines commencing about 1000 feet easterly from the Sunday Mines, is quite steep, thus giving excellent facilities for tunnel work to drain and develop the properties and affording excellent backs.

The surface of most of the sedimentaries on the mines is covered with erosion from the hills above, talus and conglomerates, and it will be only by mapping the surface showings and plotting the underground development that a much-needed topographical, surface and underground map can be made. The limes and intrusions here are characteristic of the general formations of the District.

BULLS HEAD MINE ORES:

The formation at and adjacent to the Mines are limestones, shales, slates, quartzites, rhyolites and conglomerates, many so badly altered that their original form is unrecognizable by hand sample.

These are badly broken by dykes of diorites and rhyolites and altered granitic-porphyrys. In places all is capped with conglomerates. The sedimentaries have undergone much displacement and fracture dependable on the intrusion of crystalline rocks, and in like manner most of the deposits show intimate connection and definite relation with both formations, usually occurring in the faulting planes of the limes and their adjacent bedding planes, and in seams adjacent to the fault planes, and also in the limes in and near the altered contract bodies between the limes and porphyrys.

In many places throughout these Mines the original fosseliferous limes have been altered to silicious ores, and part of the best pay ores are composed of this material, filled with the calcite remains of the shells of the productus. In general the ores are replacements forming limonitic-lead-silver-manganese ores, chiefly chlorides, carbonates. sulphides, oxides. I find anglesites, plumbojarosites, argentites, cerusites, proargysites, while residual bunches of galena are scattered through the ores, or back in the original deposits surrounded by secondaries, where the surface conditions and descending waters have not yet been able to convert them to other forms. I find in these ores faint traces of hubernites, wolfenite or molybdate of lead, but in minute quantities. There are large amounts of calcite, quartzose and earthy constituents mixed with the minerals of the ores, but nothing present in appreciable quantities to make the ores refractory.

Every condition shows these ores to be of deep seated hot solution origin, precipitated chiefly as galena, and altered later by depositions and replacements by cold solutions. Every indication is that the pay ores will increase and as a purer galena with depth to some hundreds of feet, more likely four hundred to seven hundred below the present workings, and from there to greater depth than to decrease in values and size of veins.

DEVELOPMENT WORK:

Development work in this group consists of driving several prospecting tunnels. All has been done in the usual desultory manner of the prospector, searching for high grade and leaving the medium grade ores, as they will not stand the excessive freight and bullion charges from this camp. Thur far no work has been done in or about these mines from a well laid and organized plan or upon a thorough mining and counservative business basis.

All elevations, surveys and mapping of underground work shown on Assay-Map "A", which is made a part of this report, are from hand compass work, and cannot be considered accurate. The arrows denote where samples selected were taken, the first figures the ounces in silver per ton, and the second figure the percentages of lead, and show clearly the results of my samplings.

About 124 feet south westerly and 81 feet higher than the car track at portal of the 80 Foot-Tunnel, on the level top of a prominent limestone outcrop, a 1 3/4 inch hole has been drilled and the surface of this rock is taken as "Zero" in reference to all levels. Most of the work has been on the southerly side of Scorpion Cannon. The oldest is the Scorpion Tunnel on Scorpion ground, the 93 Foot-Level. Part of this tunnel, at the portal and main Station one hundred and eighty feet farther in has partly caved. From there on to the face, 345 feet, the ground stands well. A strong draft from the 164 Foot-Level shows the tunnel is not completely closed. About 460 feet from the portal a raise from the 164 Foot-Level connects. Around the Station and 60 feet southerly, ore is shown on both sides of the drift, lying chiefly in bedding planes. From the southern end of this chute, to the south face, 345 feet from the Station, little ore is seen.

The 60 Foot-Level, the extreme earterly tunnel, is driven in Sunday ground, 155 feet in the vein and part of the time in ore. 120 Feet from the portal this tunnel connects with the 164 Foot-Level by winze.

The 80 Foot-Tunnel is driven on a fault line. Ore is round almost continuously from near the portal to past the "Y", and from there on in 355 feet from the portal. Here the drift seems to turn to the north of the ore and little ore is seen on in to the face, 100 feet.

From the "Y" the east drift turns almost due east 45 ft. and encounters ore and them runs almost due south 120 ft., in ore all the way. Here most of the ore is in what was primarily limes consisting of a mass of fossil shells of the Lower Carboniferous Period. The ore chutes here and in the 60 Foot-Tunnel dip about 40 degreen westerly.

DEVELOPMENT WORK:

The 164 Foot-Level runs south 124 degreen east 426 feet then south 30 degrees west 308 feet, a total distance of 734 feet from portal to survey peg over center of turn-table at Station. From here the south drift runs southerly 190 feet to face, showing ore almost the entire distance. 40 feet from the Station the west drift encounters feet of raise to the Scorpion or 93 foot-Level. This gives an elevation of 71 feet in the 127 foot length of raise.

The north-drift runs a mean course of north 25 degreen west 220 feet from the Station. The pay lays in a bedding plane above the drift with a pitch of 20 degrees easterly. To the west much ore has been stoped, only the highest grade being taken out, leaving in sight large amounts of medium grade ore. A raise leads off from the north westerly end of the stope, showing good ore values. The average ore width is over two feet, the rich portions averaging about twelve inches in width, the medium grade ore always connecting the pockets or richer ore.

It is impossible to measure up the ore in this mine, as but one side of any chute shows, and as the ore follows the fault lines and bedding planes they simply must be followed and ores taken out, but there is possibility in sight, judging by past experience in similar deposits and a careful examination of this mine, ten thousand tones of ore averaging twenty seven ounces of silver per ton and three percent of lead.

Above the 164 Foot-Level about thirty percent of the ore has been extracted from the mine. Throughout these mines the air is pure and cool, with good ventilation, the ground breaks good and stands well, needing but few stulls. The 164 and 30 Foot-Levels are well equipped with cars and fourteen pound rail.

MINE VALUES:

Results of samplings are plainly shown on Assay-Map"A", which is part of this report. Anequalized aliquot sample from all samples taken gave twenty-eight(28.1) ounces silver per ton of ore, and four and eight tenths (4,8%) percent lead.

WASTE DUMP VALUES:

There are about nine thousand tons of waste on the dumps at the mouths of the different tunnels, which by passing over a two-inch-square mesh screen will give about three thousand tons of pay. The samples from the dumps screened as mentioned gave the following results:

		Silver	Lead
60'	60' Level East Tunnel Dump	14.30 ounces	1.80%
	80' Level No. 1-Tunnel dump	16.00 ounces	3.80%
	93' Level Scorpion dump	13.50 ounces	2.80%
	164' Level No. 2 Tunnel dump	12.20 ounces	2.00%
	Aliquot from four samples	15.50 ounces	3.10%

SURFACE IMPROVEMENTS:

Good wagon roads lead to the portals of the different tunnels and there is an ore bin for storing ore and loading wagons. The camp buildings are new, warm and comfortable, and nicely sutuated on the north easterly side of the hill, convenient to the mines, with room for about fifteen men. The boarding house is large, roomy and well equipped.

METALLURGY:

An exhaustive and carefully conducted and checked series of tests of both mine and dump samples show they are not amenable to west concentration, or oil flotation, nor can a dual treatment offer any inducement to lessen reduction of smelting costs or aid in the handling of lower grade ores.

Four different west concentration tests, a total of twelve tests altogether, made upon each aliquot from Mine-samples, Scorpion Dump Samples and 60-Foot, 80-Foot, and 164-Foot waste dump samples gave as the best results the following concentration and extraction:

	CONCENTRATION	PERCENT EXTRACTED Silver	Lead
Mine	9.26 tons into 1	27.26%	47.24%
Scorpion Dump	16.33 tons into 1	12.24%	18.37%
Tunnel Dump	19.50 tons into 1	11.71%	25.64%

OIL CONCENTRATION tests made upon a part of the above aliquots were carefully conducted, long and exhaustive and included different periods of time, agitators, methods, and as well the uses of in different tests the following oils and acids and combinations thereof:- Eucalyptus, California crude, pine oils, rafined and crude, creosote, coal tar, etc., sulphuric acid and sulphate of copper; no matter what filmer, frother or collector used the best extraction was never above twenty-eight percent of the silver and thirty one percent of the lead.

RESPECTFULLY SUBMITTED

HERMAN DAVIS

EXHIBIT "G"

Index Mining Company
21 [illegible]th W. Temple Street
Salt Lake City 1, Utah

SHIPPER SETTLEMENTS FROM THE MOLLISHEAD MINE, BOUNDARY DISTRICT OPERATED BY LESLIE E. JOHNSON AND MOLLISHEAD MINING & SMELTING CO.

Date	Ozs. Au.	% Pb.	% Insoluble	% Fe.	Net Payment	Lbs. Dry
1920						
Aug. 18	11.20	26.80	6.80	21.50	$ 935.59	60,842
18	10.20	22.20	8.60	29.60	700.59	55,818
Nov. 12	11.60	21.90	24.80	19.60	534.83	62,194
1921						
Aug. 11	18.00	42.10	17.40	12.00	774.21	57,194
Sep. 20	21.65	44.60	16.60	12.45	1155.98	77,088
Oct. 28	20.90	45.60	17.00	9.50	1227.60	72,974
Nov. 16	28.20	43.30	19.20	9.70	1015.22	64,772
" 22	90.60	11.50	35.30	22.10	1056.24	45,982
Dec. 20	12.50	31.00	22.60	19.30	666.95	69,328
" 20	34.60	9.60	35.80	21.50	1261.65	61,810
1922						
Jan. 4	19.20	34.60	22.20	14.90	479.37	30,498
June 22	24.70	29.00	19.50	19.80	694.16	40,534
" 27	21.90	19.90	30.60	19.30	690.97	59,196
July 18	35.20	11.20	41.90	8.75	670.62	69,344
July 27	17.00	41.00	14.60	15.40	1157.42	80,258
Oct. 25	39.00	11.20	40.80	9.10	1246.25	43,500
Nov. 10	34.30	7.90	27.50	7.70	612.94	21,468
" 29	29.70	2.20	47.80	4.93	529.05	27,390
Dec. 15	32.70	1.90	50.40	15.40	426.26	52,550
" 16	23.60	2.30	53.30	12.50	313.76	24,528
" 26	35.60	3.40	48.00	16.80	541.04	56,588
1925						
July 1	6.05	5.78	25.05	4.69	101.56	57,336
" 28	13.70	26.70	27.00	16.50	963.67	63,468
Sep. 29	13.70	20.30	21.80	4.86	677.35	47,460
Oct. 8	24.76	34.20	16.30	3.54	1572.22	56,792
1926						
Mar. 17	7.50	14.10	26.80	25.80	25.68	4,074
Mar. 17	22.30	35.40	16.00	6.31	242.20	8,468
June 10	20.55	8.38	20.65	3.95	550.92	60,824
1927						
Oct. 21	11.67	22.40	24.20	16.90	282.33	25,910
Oct. 21	12.64	11.70	33.80	21.30	408.35	71,184
Oct. 21	11.65	13.00	33.60	22.40	227.44	37,344
1928						
Sep. 22	12.00	8.20	45.00	15.00	301.12	69,888
Nov. 28	12.15	13.10	34.70	23.10	32.94	10,670
1929						
May 29	17.00	24.60	23.00	19.90	733.31	61,652
1930						
Oct. 3	18.40	27.00	29.65	15.30	404.73	46,510
1932						
Apr. 28	20.90	33.70	20.00	14.30	16.12	2,850
1933						
Nov. 6	11.30	16.10	24.80	21.80	94.40	43,518
July 13	0.00	12.60	23.60	25.20	19.72	28,824
July 13	11.30	17.80	5.50	22.50	134.00	50,740
1934						
June 25	32.10	57.05	3.60	11.40	111.30	9,376
Oct. 18	12.92	23.15	14.20	21.30	397.96	57,994
June 25	16.25	34.75	9.15	21.90	662.05	83,776

We have no record of the vast amount of ore treated in the smelters located at Spruce Mt. in the early days, nor do we have the records of ore shipped before the smelters were built.

EXHIBIT "6"

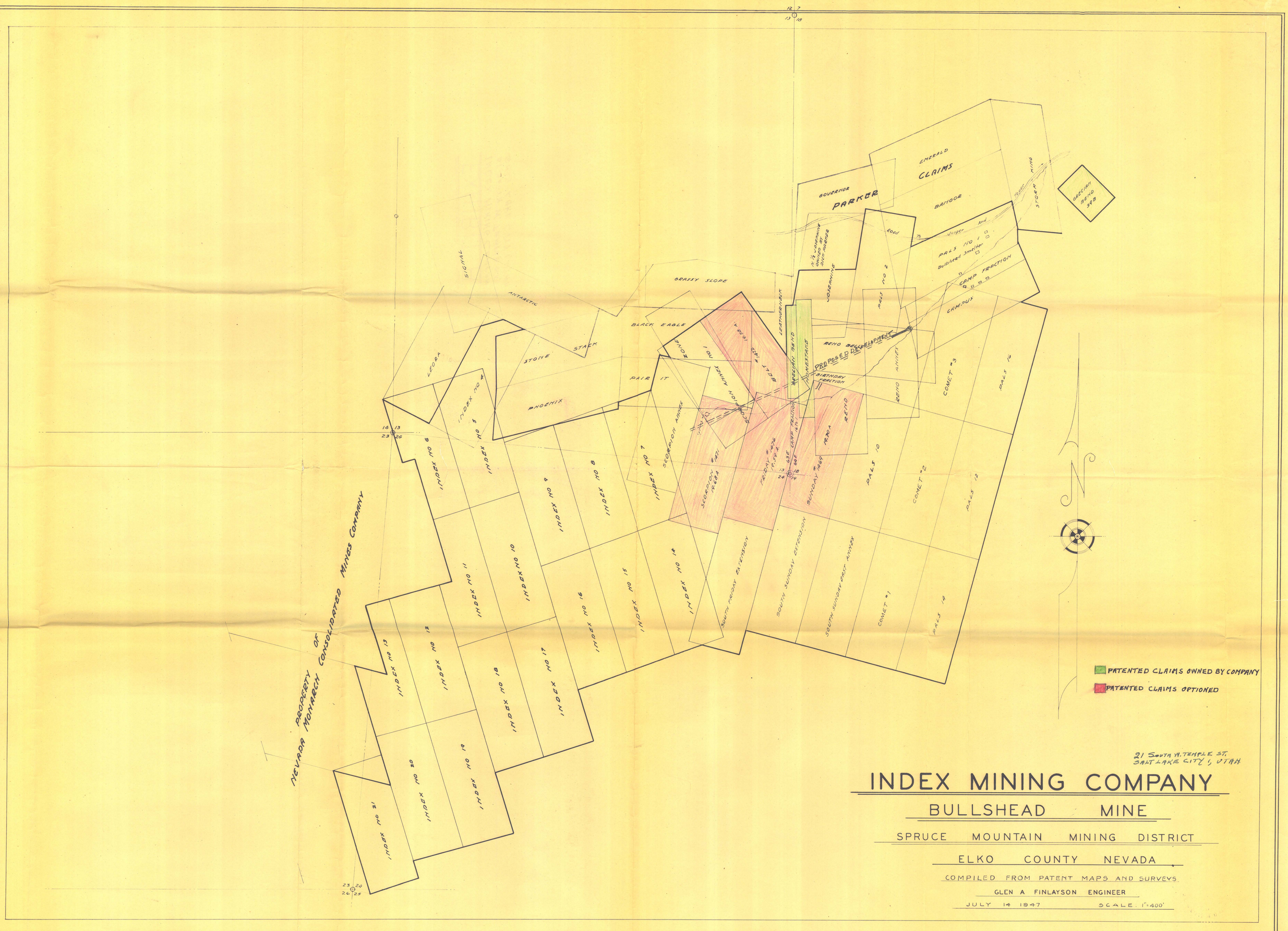
SHIPMENTS

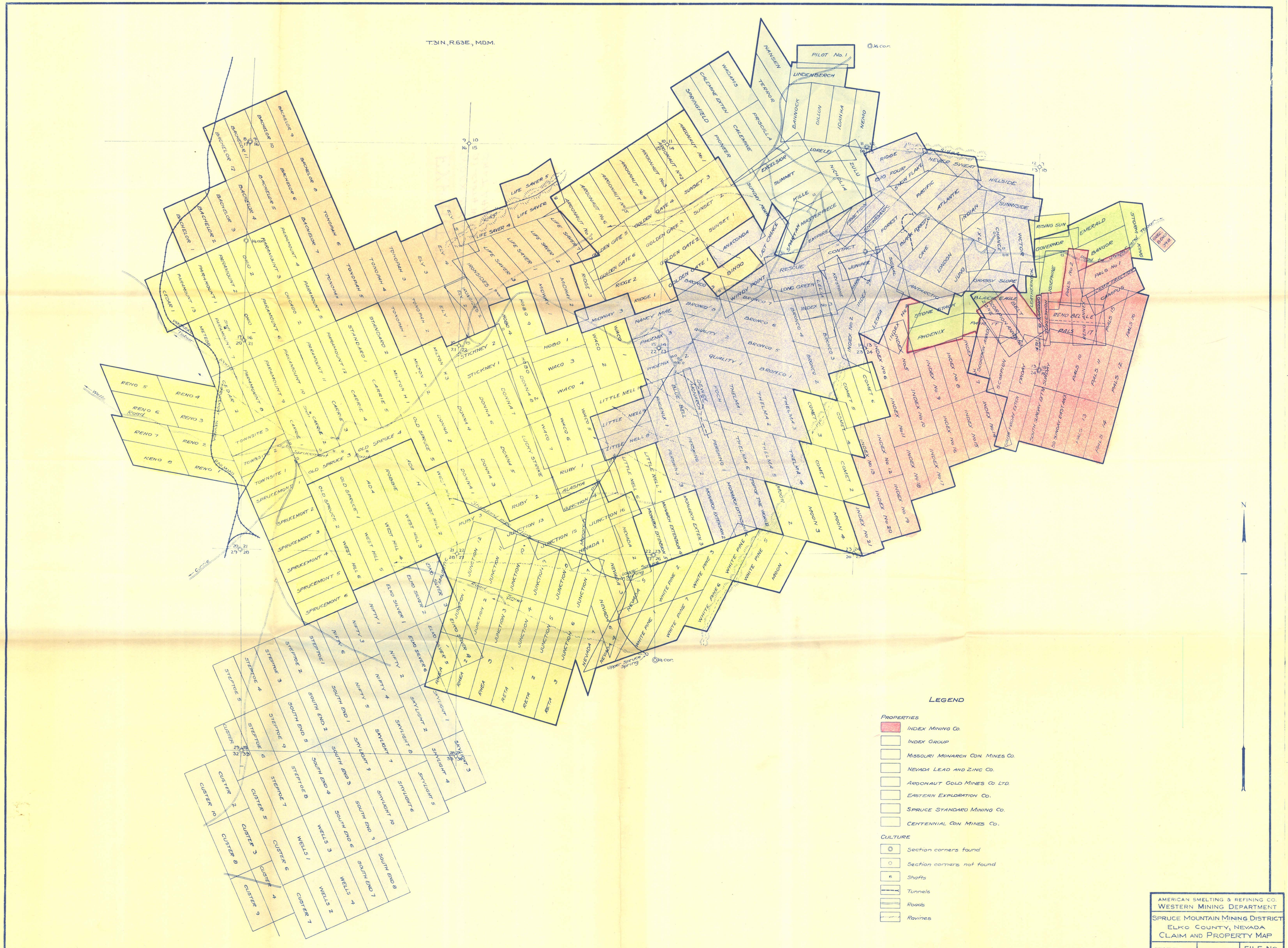
SHIPMENTS MADE BY THE INDEX MINING CO. FROM THE BULLSHEAD MINE.

DATE	LOT NO.	OZS. SILVER	% LEAD	% INSOL.	% IRON	LBS. DRY	SMELTER SETTLEMENT
6/25/34	1	32.10	57.05	3.60	11.40	5,376	$ 106.20
6/19/34	2	16.25	34.75	9.15	21.90	83,776	862.05
10/8/34	3	12.92	28.15	14.20	21.30	57,994	397.96
7/1/35	4	15.50	19.00	26.40	20.00	47,122	283.80
7/2/35	5	12.19	1.50	38.20	18.60	74,942	155.36
7/8/35	6	9.50	2.80			89,702	100.80
8/9/35	8	22.25	1.80			33,440	171.51
8/13/35	9	32.35	1.30			60,966	510.08
8/29/35	10	29.25	.90			64,964	495.98
9/12/35	11	24.95	2.20			87,970	580.55
10/5/35	12	10.95	26.05	16.85	22.40	36,812	294.82
10/5/35	13	7.60	3.45	50.10	17.00	33,932	000.00
10/10/35	14	20.10	4.35			55,500	231.90
10/12/35	15	16.3	6.40	41.55	21.65	83,204	232.84
10/14/35	16	19.65	1.55	43.05	12.50	83,018	339.05
10/30/35	17	12.75	3.10	50.80	13.70	107,238	167.46
12/2/35	19	26.25	2.55	58.10	11.40	85,058	573.01
6/4/36	21	10.25	1.25			90,328	80.61
6/21/36	22	12.00	2.00			92,724	176.58

Misc. Shipments

4/27/32		20.90	33.70	20.00	14.50	2,850	16.12
6/13/39		15.00	18.50	35.40	17.40	4,374	19.12
8/11/39		11.95	13.25	50.10	12.80	4,946	20.25


GOVERNOR
PARKER
EMERALD
CLAIMS
BARTOOR
GRECIAN BEND 388
PALS NO 1
Bullhead Smelter
CAMP FRACTION
CAMPOS
JOSEPHINE
PALS NO 2
GRASSY SLOPE
BLACK EAGLE
LEATHERNECK
SIGNAL
ANTARCTIC
STACK
STONE
PHOENIX
LEORA
PAIR IT
ZOVE
BELLA
RENO DEVELOPMENT
PROPOSED DEVELOPMENT
LIMESTONE
BIRTHDAY FRACTION
RENO ANNEX
COMET #3
PALS 16
SCORPION ANNEX
SCORPION ANNEX NO 1
SCORPION #421
SCORPION #424
FRIDAY #426
SUNDAY #469
PALS 10
COMET #2
PALS 12
INDEX NO 1
INDEX NO 2
INDEX NO 3
INDEX NO 4
INDEX NO 5
INDEX NO 6
INDEX NO 7
INDEX NO 8
INDEX NO 9
INDEX NO 10
INDEX NO 11
INDEX NO 12
INDEX NO 13
INDEX NO 14
INDEX NO 15
INDEX NO 16
INDEX NO 17
INDEX NO 18
INDEX NO 19
INDEX NO 20
INDEX NO 21
SOUTH FRIDAY EXTENSION
SOUTH SUNDAY EXTENSION
SOUTH SUNDAY EAST EXTEN
COMET #1
PALS 14
PROPERTY OF
NEVADA MONARCH CONSOLIDATED MINES COMPANY
PATENTED CLAIMS OWNED BY COMPANY
PATENTED CLAIMS OPTIONED
21 SOUTH W. TEMPLE ST.
SALT LAKE CITY 1, UTAH
INDEX MINING COMPANY
BULLSHEAD MINE
SPRUCE MOUNTAIN MINING DISTRICT
ELKO COUNTY NEVADA
COMPILED FROM PATENT MAPS AND SURVEYS
GLEN A FINLAYSON ENGINEER
JULY 14 1947
SCALE. 1"=400'


T.31N., R.63E., M.D.M.
LEGEND
PROPERTIES
INDEX MINING CO.
INDEX GROUP
MISSOURI MONARCH CON. MINES CO.
NEVADA LEAD AND ZINC CO.
ARGONAUT GOLD MINES CO. LTD.
EASTERN EXPLORATION CO.
SPRUCE STANDARD MINING CO.
CENTENNIAL CON. MINES CO.
CULTURE
Section corners found
Section corners not found
Shafts
Tunnels
Roads
Ravines
AMERICAN SMELTING & REFINING CO.
WESTERN MINING DEPARTMENT
SPRUCE MOUNTAIN MINING DISTRICT
ELKO COUNTY, NEVADA
CLAIM AND PROPERTY MAP
SURVEYED BY
DRAWN BY
TRACED BY K. R.
DATE NOV. 1934
SCALE: 1 IN = 1000 FT
FILE NO.
1-247

BULLSHEAD MINE
SPRUCE MT MINING DIST - NEVADA
SURVEYED BY
KING & MALONE - OLD WORKINGS - 1919
JOHN M NEFF - NEW WORKINGS - 1934
Scale: 1"=50 Ft
John M. Neff
SCORPION
FRIDAY
SUNDAY
BELT
GRECIAN BEND
HOMESTAKE
S-74°-30'-E 600'
N-15°-30'-E 1500'
N-14°-E 1500'
S-15°-30'-W 1500'
S-75°-15'-E 600'
S-14°-45'-W-1500'
N-14°-45'-E 1500'
N-75°-15'-W 571' 600'
24 13 19 18
N-30°-45'-W 199'
N-28°-45'-W 1000'
N-29°-53'-E 748'
N-8°-E 1069'
"B" ZERO OF ALL ELEVATIONS
STEEL PLUG SET IN LIMESTONE BLUFF
60' LEVEL El: 56.03
80' LEVEL El: 75.26 0+00
160' LEVEL El: 158.47 0+00
0+26
0+32.17
SCORPION TUNNEL El: 37.43
N-63°-50'-30"-W 372.2'
S-10°-24'-30"E
S-19°-37'-30"-W 61'
S-88°-10'-30"-W 180.33'
A-B BASE LINE S-16°-23'-30"-E 623.9'
N-76°-W 600' 300'
S-59°-W 300'
S-36°-E 1500'
N-74°-30'-W 600'
N-54°-E 600'
N-50°-24'-E 361'
N-87°-15'-E 42'
199'
S-2°-45'-E 426'
378'
N-36°-W 1500'
S-2°-45'-E 435'
S-14°-45'-W 463'
S-18°-30'-W 474'
29'
CONTACT TUNNEL
No. 1 TUNNEL El: 302.5
0+00 S69°56'30"W
S-73°59'-30"W 736.21'
A103 6+24.10 El: 295.04
A102 4+94.40 S-30°-12'-30"W
A101 4+76.55 S-46°-26'-30"W
108-5+00.01
107-4+75.55 S-16°24'W
106 4+39.85 S-2°-55'E N-76°-27'W
105 3+80± N-79°-23'-30"W
104 3+06.5 N-70°-19'W
103 2+58.3 N-55°-02'-30"W
102 2+07.5 N-70°-55'-30"W
101 1+78.7 S-77°-42'-30"W
WATER BARREL
CAVED
50° RAISE
7+57.45 El=144.81
7+73.26 El=144.01
7+87.48 El=148.62
8+79.23 El=46.04
El=30.81
El=25.20
El=22.63
El=30.25
El=24.45
El=31.07
8+08.11
9+12.02 El=144.03
9+22.86 El=137.10
9+40.87
9+54.33 El=130.86
9+97.08 El=121.67
10+15.54 El=114.18
10+29
10+77
11+27
11+87
11+89
12+44
4+04.16
3+73.44
3+57.72
3+26.41
El=138.0
4+57.35 El=148.65
4+38.62 El=149.41
2+52.43
2+07.65
1+45.17
1+22.47
1+82.33
1+67.60
1+45.4
0+80.7