FILE COPY
SURNAME:

Gordon Bourret

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

July 3, 1951

Mr. James R. Cripper, President
Bear Basin Mining Company
641 N. Callow Avenue
Bremerton, Washington

Re: Antimony & Manganese
DMA docket 1379x

Dear Mr. Cripper:

Your application, DMA-1379x of May 12, 1951, for an exploration project, estimated total cost $77,700, has been received by the Minor and Rare Metals Branch of the Supply Division.

After careful review, I regret to advise it has been decided to reject your application at this time, on the basis of there being insufficient evidence of the probability of developing commercial amounts of antimony ore in appreciable quantity.

Yours very truly,

Tom Lyon

Tom Lyon, Director
Supply Division

WBourret/mh
cc: Adm. Read. File
Strobel
Lyon
Field Team II
Bourret
Files

REMAINDER OF APPLICATIONS ETC. IN OTHER FILES.

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

July 3, 1951

Mr. James M. Gripper, President
Bear Basin Mining Company
641 N. Callow Avenue
Bremerton, Washington

Re: Antimony & Manganese
DMA docket 1379x

Dear Mr. Gripper:

Your application, DMA-1379x of May 12, 1951, for an exploration project, estimated total cost $77,700, has been received by the Minor and Rare Metals Branch of the Supply Division.

After careful review, I regret to advise it has been decided to reject your application at this time, on the basis of there being insufficient evidence of the probability of developing commercial amounts of antimony ore in appreciable quantity.

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Files

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

July 3, 1951

Memorandum

To: Landon F. Strobel, Executive Secretary

Through: Director, Supply Division

From: Minor and Rare Metals Branch

Subject: Bear Basin Mining Company
Antimony - DMA - 1379x

Under date of May 12, 1951, the Bear Basin Mining Company, 641 N. Callow Avenue, Bremerton, Washington applied for an antimony, manganese exploration project in the amount of $77,700.00, for a government participation of $58,275.00

Attached hereto find letter of even date addressed to Mr. James R. Cripper, President, denying his application on the grounds of insufficient evidence of occurrence of commercial antimony ore.

The geological survey reports that the ore shoots are small and thin, and the antimony content is low and is in complex combination with other metals.

Attached hereto is the complete docket file, which includes the following:

(a) Three bound folders forms MF-100 and exhibits
(b) Three bound folders forms MF-103 and exhibits
(c) Two reviews of application, one undated signed by R. G. Yates, U.S.G.S. the other by E. T. McKnight, U.S.G.S. dated June 28, 1951.

Approved:
Director, Supply Division
Attachment

Weston Bourret, Chief
Minor and Rare Metals Branch

FILE COPY
SURNAME:

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

July 3, 1951

Memorandum

To: Landon F. Strebel, Executive Secretary

Through: Director, Supply Division

From: Minor and Rare Metals Branch

Subject: Bear Basin Mining Company
Antimony - DMA - 1379x

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approved.

Tom Lyon

Weston Bourret, Chief
Minor and Rare Metals Branch

Attachment
WBourret/mh
cc: Adm. Read. File
Strobel
Lyon
Field Team II
Bourret
Files

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

July 3, 1951

Memorandum

To: Landon F. Strobel, Executive Secretary

Through: Director, Supply Division

From: Minor and Rare Metals Branch

Subject: Bear Basin Mining Company
Antimony - DMA - 1379x

Under date of May 12, 1951, the Bear Basin Mining Company, 611 N. Callow Avenue, Bremerton, Washington applied for an antimony, manganese exploration project in the amount of $77,700.00, for a government participation of $58,275.00

Attached hereto find letter of even date addressed to Mr. James G. Crippen, President, denying his application on the grounds of insufficient evidence of occurrence of commercial antimony ore.

The geological survey reports that the ore shoots are small and thin, and the antimony content is low and is in complex combination with other metals.

Attached hereto is the complete docket file, which includes the following:

(a) Three bound folders forms DF-100 and exhibits
(b) Three bound folders forms DF-103 and exhibits
(c) Two reviews of application, one unsigned signed by R. G. Yates, U.S.G.S. the other by L. T. McKnight, U.S.G.S. dated June 28, 1951.

approved: Tom L.

Leston Bourret, Chief
Minor and Rare Metals Branch

Attachment
LBourret/mh
cc: Adm. Read. File
Strobel
Lyon
Field Team II
Bourret
Files

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

June 28, 1951

Memorandum

To: Mr. Weston Bourret

From: Mr. Edwin T. McKnight

Subject: DMA 1379X, application of Bear Basin Mining Company, King County, Washington for loan of $77,700 (the Government furnishing 75%) to explore their vein in Bear Basin.

The vein is on a narrow fault zone in granodiorite, and has been opened by a tunnel 454 feet long. The vein contains 2 ore shoots. One, in the first 60 feet of the tunnel, contains 6-12 inches of vein material, consisting of gangue minerals and sulfides. The sulfide minerals are jamesonite (a lead antimony sulfide), galena, arsenopyrite, stibnite, sphalerite, pyrite and chalcopyrite. Also a little freibergite (an argentiferous tetrahedrite) and andorite ($PbAgSb_3S_6$). Values are chiefly in silver with some gold. Assay over a 3.4 width, as quoted by applicant, is .05 oz. gold, 23 oz. silver, 0.76% lead and 1.24% antimony. This ore shoot has a 22 foot winze on it.

The second ore shoot is at 180-220 feet in the tunnel, and is described as a 6-8 inch vein containing gangue minerals as well as sulfide minerals. No assay is given, but it is described as a smaller ore shoot.

There has been no production.

The proposal is to sink the winze on the first ore shoot to a depth of 100 feet, and to drift 150 feet each way from the foot of this winze; also to start a new tunnel 400 feet lower and 1000 feet distant from the present workings, crosscut 100 feet to the vein, drift 1000 feet on the vein, and raise 300 feet to the previously opened workings.

It is recommended that this application be denied. The ore shoots are small and thin, occurring only where intersecting faults come in and join the main fault, and there is much barren ground along the fault. At best, quoting the applicant's assay, the antimony content is low and is in complex combination with other metals.

Rather than being a salable asset, the antimony is more likely to be a hindrance to the sale of the silver, which is the main valuable constituent of the ore. Applicant, in describing access to smelters, mentions specifically the Tacoma smelter, which, however, is known to have rejected similar ore from the Cleopatra group of claims, about 1 mile from applicant's mine.

C. P. Purdy, in "Antimony Occurrence of Washington" published in 1951, describing the existing tunnel on this property, says: "Nowhere in the vein are the antimony-bearing minerals.....plentiful enough to be of more than mineralogic interest".

Edwin T. McKnight
Edwin T. McKnight
Geologist

Should be denied. E.T.W.

DMA 13 79 X

Bear Basin Mining Co. Antimony

Tenor of ore given in application (1.24% antimony across 3.4 ft. of drift) does not agree with statement of C. Phillips Pardy, Jr. in Bull. 39 "Antimony Occurrences of Washington", 1951. Pardy says in reference to the No 3 adit, "nowhere in the vein were antimony minerals ..... plentiful enough to be more than a mineralogical curiosity."

A field examination with sampling will be necessary to determine whether the applicants or Pardy is correct.

~~As~~ The application is made for a 4 phase exploration project given under "21".

The first and second phases (sinking a 100 ft winze and 300' of drifting) seem justified if the sample data is correct & not misleading. However, the third & fourth phases (driving a 1100 ft. adit and a 300 foot raise) is not justified unless the first & second phases develop a promising ore body. As the bulk of the money would go to this later work ~~it~~ the amount of the request is far too high.

I suggest possibility of driving same in the D.D.

From the descriptions it appears that what is being explored for is silver and not antimony.

Rosy

Robert G. Yates
U.S. Geological Survey

FILE COPY
SURNAME:

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

June 7, 1951

Mr. James R. Crippen
President
Bear Basin Mining Company
641 N. Callow Avenue
Bremerton, Washington.

Subject: DMA-1379X
Re: Exploration Loan
Cody and Tuttle Claims

My dear Mr. Crippen:

Receipt is acknowledged of your application and attachments of May 31, 1951 for an exploration loan under the Defense Production Act of 1950.

The application was assigned Docket Number DMA-1379X and was referred to Mr. Weston G. Bourret, Acting Chief, Minor and Rare Metals Branch on June 1, 1951.

In any future correspondence relating to your application, kindly refer to DMA-1379X.

Sincerely yours,

LANDON F. STROBEL

Landon F. Strobel
Executive Secretary

LFSTROBEL:js
cc: Strobel-2
Files
Bourret
Lyon

Form MF-100
(March 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Form approved.
Budget Bureau No. 42-R1026.

GENERAL TECHNICAL DATA FOR USE UNDER THE DEFENSE PRODUCTION ACT OF 1950

NOT TO BE FILLED IN BY APPLICANT

Docket No. DMA 1879 X

Date received 5-31-51

Bear Basin Mining Co.
641 N. Callow Ave.
Bremerton Washington

Name and address of applicant

Date 12 May, 1951

INSTRUCTIONS

This form is to be filed with Defense Minerals Administration, Department of the Interior, Washington 25, D. C. It should be accompanied by appropriate application form when a specific type of Government assistance is requested, in the form of (1) loan, (2) purchase contract, (3) Government guarantee of a private loan, (4) Necessity Certificate pursuant to the provisions of Sec. 124–A (Amortization Deduction) of Internal Revenue Code, 1950, (5) priorities or allocation of mining equipment, and maintenance, repair and operating supplies, and (6) other forms of Government assistance that might arise under the Act. Submit four (4) signed copies of the form and accompanying papers. Name and address should be stamped or typed on each sheet of this form and all accompanying papers. *When a question is inapplicable it should be so stated on the form.* Additional sheets may be attached in answering any questions or in supplying additional information. (IF YOU CANNOT ANSWER A QUESTION, SO STATE.) If a question is answered elsewhere indicate where answered. It is not necessary to answer it again.

GENERAL TECHNICAL DATA

Supply the following information on separate sheets, arranged, numbered, and lettered as indicated:

1. Materials produced:
   (*a*) What are the chief mine, mill, or smelter products?
   (*b*) What are the byproducts, if any?
2. Name(s) and type(s) of mine(s), mill(s), smelter(s), refinery(ies), pit(s), quarry (ies), drilling operation(s). Include old names of property, if any. Show extent of workings, including the following:
   (*a*) Linear feet of shafts.
   (*b*) Linear feet of drifts and crosscuts.
   (*c*) Linear feet of tunnels or adits.
   (*d*) Linear feet of other mine openings (explain briefly).

   Indicate whether mine is flooded or not. Describe any pumping problems. Give size or productive capacity.
3. For each operation listed above supply the following:
   (*a*) Distance and direction from nearest town and shipping point.
   (*b*) Mining district.
   (*c*) Township, Section, Range.
   (*d*) County, State.
4. (*a*) State whether or not property is now in operation, and if in operation, by whom operated.
   (*b*) Are you operating this property as:
   - [x] Owner.
   - [ ] Lessee.
   - [ ] Contractor.
5. Number of years in production None to date

   If not in production or operation, estimated date when production will begin Sept. 1952
6. Experience of operators:

   Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who manage the project.
7. History:
   (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for suspension of operation.
   (*b*) State briefly the known history and production of adjoining and neighboring properties.
   (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.

8. Names and addresses of Officers, Directors, or Partners, and in addition thereto, the five largest stockholders if applicant is a corporation.

Name and Address	Official Title (If officer is also director indicate by "D")	Total of Annual Salary, Commissions, Bonuses, Etc., Received From Applicant and Affiliates During Last Fiscal Year	Estimated Net Worth Outside of Interest in Applicant	Number of Shares Held in Applicant Corporation		Life Insurance Carried for Benefit of Applicant	
				Common	Preferred	Amount	Net Cash Surrender Value After Loans
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
James Robley Crippen	President D		$12000	127,850	none	none	-
Edwin Rome Saurers	Vice Pres. D		$12000	125,410	none	none	-
Delbert White Jenkins	Secretary D		$12000	4,000	none	none	-
Harry Francis Winkley	Treasurer D		$22000	17,500	none	none	-
Carl Louis Johnston	Director		$12000	127,410	none	none	-
Ralph Willis Rabidue	Director		$17500	14,110	none	none	-
Edward Selmer Hall	Director		$10000	127,410	none	none	-
		See attached		scedual			
	Total		x x x x x			x x x x x	x x x x x

If more lines are needed continue on separate sheet.

9. 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	$173,614	$	$ .10		none
Preferred stock	$126,386	$	$ .10		none

*Indicate period covered.

10. Production: none

Item	Kind of Product (a)	1948 Total (b)	1949 Total (c)	1950 Total (d)	Present Average Monthly (e)
1. Quantity of product mined or quarried (Short, long, metric tons; barrels; pounds; etc.)	-	-	-	-	-
2. Quantity of product processed (specify unit of measure and type of process)	-	-	-	-	-
3. Quantity and grade of product sold or shipped (specify units of measure)	-	-	-	-	-

11. Do you contemplate a change in the present average monthly rate of production? If so, state estimated maximum monthly production and basis of change. The Company expects to go into production in the fall of 1952 1500 short tons monthly

12. Ore or Mineral Reserves:

(a) Describe the ore or mineral deposit briefly. Accompany the application by any available report on the geology and ore reserves. see attached schedule

Part 8 continued

Name	office	Est. Net Worth	Common stock	Pref.	Ins.
Adolf J. ? Lider	Dir.	$11000	5000	none	none
Louis (none) Punnett	Dir.	$15000	1000	none	none
Alfred J. ? DeBaer	Dir.	$16000	25000	none	none
Neol A.? Brooks	Dir.	$15000	20000	none	none
	Total	$154,500.00	594690	--	--

(*b*) If deposit is other than placer:

(1) Submit assay plans and/or sections showing location and size of proved (measured) and probable (indicated) ore or mineral reserve.

(2) State the tonnage (indicate type of ton) and grade of each class of ore reserve, as above, and show how computed. Tabulated total ore reserve as follows:

TOTAL ORE OR MINERAL RESERVES

Ore or Mineral Reserve	Estimated Tons (a)	Metal or Mineral Content Per Ton (Grade) (b)	Gross Value Per Ton (c)	Recoverable Unit Value Per Ton (d)	Estimated Cost of Production Per Ton (e)
Measured (proved)					
Indicated (probable)					

(*c*) If placer:

(1) Give estimated total yardage and average marketable mineral content of each deposit.

(2) Submit map showing location of placer deposit and surrounding area, with all test holes or pits. Submit logs of each hole and test pit with depth and average value of each.

(3) Describe gravel, stating whether fine, medium or coarse; loose, tight, cemented, or frozen, and whether it contains stumps or boulders more than 1 foot in diameter; if so, how large, and in what proportion.

(4) Describe bedrock, giving type (granite, sandstone, shale, etc.) and state whether it is hard or soft, smooth, uneven or rough.

(5) Describe overburden, stating whether loose, tight, or cemented; fine or coarse textured; furnish estimate of average thickness and total amount.

(6) Tabulate the reserves using the form outlined above for ore or mineral reserves.

13. Access Roads:

Give road distances to shipping, supply and residence points, stating kind and condition of roads.

14. Water Supply:

State source and quantity of water available for operations and whether sufficient for all seasons of year.

15. Power:

State amount of power used, rate per hour, and source thereof.

16. Labor: None to date. The rate paid in this distrect, $11.00 and board.

State number and classes (miners, muckers, millmen, etc.) of men employed during a recent representative payroll period.

17. Equipment and Facilities:

Describe present equipment on the property, including buildings. (State condition.) List major pieces of equipment now owned or controlled and in serviceable condition available for this operation.

18. Are there any particular conditions or circumstances affecting your operations that are not described above? If so, explain.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

Bear Basin Mining Co.
(Name of company)

By James B. Crippen
(Signature of authorized official)

May 28, 1957
(Date)

President
(Title)

Title 18, U. S. Code (Crimes), Section 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 16—63792-1

April 17, 1951

Bear Basin Mining Company, Inc.
641 North Callow Avenue
Bremerton, Washington

Gentlemen:

Enclosed herewith is a copy of a press release dated April 11, 1951, a copy of the pertinent regulations, Form Me-5, also five copies each of the Form MF-100 (General Technical Data) and Form MF-103 (Application for Aid for an Exploration Project).

Very truly yours,

J. B. Gowen

J. B. Gowen, Acting Chief
Copper Branch, DMA

Enclosures 11

JBGowen:ba

Copy to Executive Secretary
Copper Branch, Rm 3423
F i l e s

General Technical Data

1. Materials produced:

(a) Antimony, lead, copper, manganese, zinc, silver and gold.

(b) The manganese listed above may be considered as a byproduct. This manganese is in the carbonate form and is not recovered in the mill but passes into the tailings where it is planed a leaching plant will be installed for the recovery of the manganese.

General Technical Data

(2)

The Bear Basin Mining property is a group of twenty five lode mining claims in a contiguous group. These claims were known, from about 1905 until April 1946 as the Snoqualmie Mines.

(a) The only shaft on the property, a winze 22 feet deep sunk along the vein and 40 feet from the portal of No. 3 tunnel.

(b) No. 1 tunnel, a drift about 20 feet long. Shows values in silver and gold, no data on base metals. No. 3 tunnel a drift 480 feet on a fissure vein, good values in antimony, lead, zinc, silver and manganese. No. 4 tunnel, a drift 20 feet long on a fissure vein, similar to No. 3. No. 4 tunnel a drift 400 feet on a fissure vein, similar to No. 3. No. 6 tunnel a drift 480 feet on a fissure, values in copper lead silver and gold, molybdenum is present in unknown amounts. In addition there is 55 feet of crosscut and 50 feet of drift opening a paralell fissure with values in copper lead silver and gold. No. 7 tunnel a crosscut 450 feet in length cutting the same veins exposed in No. 6 tunnel but about 70 feet lower. No. 8 tunnel a drift 15 feet on a shatered zone, no data. and No. 2 tunnel a crosscut 30 feet, does not reach the vein it is intended to expose. Total 1995 feet of drifts and crosscuts.

(c) No tunnels or adits other than those mentioned in paragraph (b).

(d) Two trenches each 15 feet long and 10 feet deep expose the top of a minerialized fissure haveing a value of 6 % antimony across a 4 foot width, the trenches are about 1500 feet above Nos. 3, 4, 5 tunnels and is considered a part of the same vein system.

The existing weinze stands full of water, however this winze when emptied takes several days to refill. No pumping problems are indicated or expected. It is thought that we will be able to bale the water out of the shaft down to the proposed depth, one hundred feet.

General Technical Data

3.

(a) All operations listed are two miles by trail and twenty three miles by county road from the nearest shipping point, North Bend, King County Washington.

(b) The property lies along the east boundry and within the Buena Vista Mining Distrect.

(c) The Property is located in Sections 13, 14, 23 and 24 , Township 25 N. Range 10 E. W. M.

(d) King County, Washington.

6.

(a) The business experience of the management of this corporation is confined principaly to the period of time the corparation has been in business, the business ability of the management of the corporation is attested to by the fact that the Corporation was formed in April 1946 without assets other than the determination of the incorporaters , and today, the local branch of the National Bank of Commerce rates the Corporation as having assets worth $60,000.00. net.

The mining experience rest cheifly in three of the incorporaters, Mr. Saurers, born in Montana and grew up in the mines where his father leased, in recent years has been emploied as a professional prospector. Mr. Hall raised in Butte Montana, miner and shift boss for Anaconda Copper Co. recently superntendent for Preistly Mining & milling Co. on their operations at the Lennox Mine, in the Buena Vista Mining Distrect King County, Wash. Mr. Crippen, raised in California, worked in California mines, prospected in the Serrias, has for years made a study of under ground mining and treatment of ores for mineral recovery.

(b) The experince of the applicant and management is covered in the above.

General Technical Data

7.

(a) The underground exploration of the Bear Basin mine to the present time consists chiefly of crosscuts to and drifts along mineral veins exposed in the face of cliffs surronding the floor of the basin, there are eight of these openings verying in length from fifteen,to four hundred eighty feet. Metalic minerals in verying amounts are present in all but one of these openings, No. 2 tunnel was abandon before it had reached the vein it was intended to crosscut. There is exposed in two of these openings mineral deposits of excelent grade. The nature of these deposits indicate that further exploration will open deposits of commercial grade ores in the other drifts. The accompaning milling test made by the Denver Equipment Company, of Denver Colorado, on ore from the No. 3 tunnel,Bear Basin Mine is indicative of what is expected will be found in tunnels No. 1 , 3, 4, 5, and 8 on the Bear Basin property. On the Dwason Claim at an elevation twelve hundred feet greater than the portal of the No. 3 tunnel,is found vein with excelent antimony values , this ore has been identified from thin sections as having had a common origion with the ores found in the No. 3 Tunnel. The No. 6 Tunnel and acompaning crosscut exposes a shear zone fifty feet wide containing opening filled with sulphides of copper , lead and iron good silver values and some gold are present. Molybdenum has been found here and we have been advised to make further checks for this metal. The No. 7 Tunnel a crosscut to the same zone as exposed in No. 6 Tunnel is four hundred fifty feet long and cuts the vein at a depth seventy feet lower than No. 6., Copper, lead, silver and gold are present, further drifting off of this crosscut will be necessary to get under the values shown in the upper workings.

(b) The Cleopatra Mine in the Miller River District is the nearest propert to the Bear Basin Mine on which any significant amount of development has been done, this mine is across the devide from, and is on one of the veins that breaks through the cliffs into Bear Basin. Several shipments of ore from this property were sent to the Tacoma Smelter, these shipments were penalized so highly for their antimony content that further shiping of ore was given up as unprofitable. The Aces Up Mine further down the mountain from Bear Basin, and still on the same vein system tried one small shipment to the Tacoma Smelter with the same result as the Cleopatra experienced. The Coney Basin Mine also in the Miller River District and across the divide from Bear Basin, is beleived to have shipped considerable ore or concentrates during the time of the First World War, the ores from this mine are principaly valued for their lead, zinc and silver.with low antimony content.

continued

General Technical Data

7. continued.

(b) The Apex Mine three miles to the north of Bear Basin is believed to have had several years of profitable operation. no details of this operation are available.

(c) The attached reports on the Bear Basin Mine are;

(1) Gelogical Report by, F.A. McMillin, Dean of Geology College of Puget Sound, Tacoma, Wash.

(2) Geological and engineering report with recomendations by, H. L. Bethel, Regesterd Mining Engineer, Seattle, Wash.

(3) Development costs Estimate, BY H. L. Bethel. Regestered Mining Engineer, Seattle Wash.

(4) Milling test report, Denver Equipment Company, Denver Colorado. This report is the result of tests Made on the Silver lead antimony ore from the No. 3 tunnel of the Bear Basin Mine.

General Technical Data

4.

(a) The property is not now in operation.

(b) The Bear Basin Mining Company is purchaseing the property by contract withe Albert Pearson, Trustee. Attached is copy of contract (as amended), which is in good standing; no payments in default.

Option and Agreement to Purchase
Snoqualmie Mine

Option: In consideration of Two-hundred Dollars ($200.00), receipt ds which is acknowledged by first party, said first party, ALBERT PEARSON as Trustee (for the benefit of the creditors of the Snoqualmie Mining Company, a Washington corporation now dissolver) hereby gives and grants to EDWIN SAURERS, C. L. JOHNSON, J. R. CRIPPEN and EDWARD HALL, all four of Bremerton, Washington, second parties herein, an option to purchase the following group of 25 unpatented lode mining claims, known as th Snoqualmie Mine, located in King County, State of Washington, in the Snoqualmie National Forest and in the Buena Vista Mining District, in Sections 13, 14, 23 and 24, Township 25 North, Range 10 East, W. M., on and near Bear Creek, a tributary to Lennox Creek, said mining claims being named as follows:

"Alec Lode Claim"
"Ackon Lode Claim"
(known also as Ackron Lode Claim)
Brown Lode Claim"
"Cook Lode Claim"
"Dexter Lode Claim"
"Daisy Lode Claim"
"Dawson Olde Claim"
"Hattie Lode Claim"
"Hardyy Lode Claim"
"Ida Lode Claim"
"Jennie Lode Claim"
"Josher Lode Claim"
"Louie Lode Claim"
"Maud Lode Claim"
"Mable Lode Claim"
"Milton Lode Claim"
"Pearl Lode Claim"
"Seattle Lode Claim"
"Tar Lode Claim"
"Tuttle Lode Claim"
"Vista Lode Claim"
"Pansy Lode Claim"
(known also as Pansy Lode Claim)
"Comton Lode Claim"
(known also as Comtuck Lode Claim)
"Cody Lode Claim", and
"Govenor Lode Claim"
(known also as Guvenor Lode Calim)

together with all veins and minerals therein, extralateral rights, improvements, and appurtenances, including whatever water rights rights of way and other easements first party may have, also whatever equipment now on the premises belonging to first party, all which mining claims and property are hereinafter referred to as Property.

This option shall be good from date hereof until December 31st, 1946, inclusive; during which time second parties shall have the right of possession and the right to test the ground for valuable minerals to such extent and in such minerlike manner as

they deem best. After completing such testing but within said time second parties agree to serve on or send by registered mail to first party a written notice stating whether or not they intend to exercise the option. And if they so state they intend to exercise the option they shall exercise same by paying to first party on or before December 31st, 1946, Nine-Thousand eight-Hundred Dollars ($9,800.00); which money together with said $200.00 first above mentioned shall be applied on the purchase price. If however they give written notice of intent not to exercise the option or fail to give any written notice within said time, this option shall automatically and without notice expire; in which event first party shall retain said $200.00 as liquidated damages, and second parties agree to remove their equipment, supplies and improvements (other than timbering and the like) from the premises within six months, otherwise same to become the property of first party.

If second parties exercise the option as above described, they shall be entitled to purchase the Property on the following terms and conditions; and first party thereupon agrees to endorse on and at the end of this option and purchase agreement an acknowledgment of receipt of said total $10,000.00 and that the option has been duly exercised.

Purchse Price. The purchase price of the Property shall be Fifty-thousand Dollars ($50,000.00), payable by second parties as follows: Ten-thousand Dollars (10,000.00) paid in exercising said option, viz. the $200.00 and the $9,800.00 herein before mentioned; Ten-thousand Dollars ($10,000.00) or more on or before June 30, 1947; Ten-thousand Dollars ($10,000.00) or more on or before December 31st 1947; Ten-thousand Dollars ($10,000.00) or more on or before June 30th 1948; and the remaining unpaid balance on or before December 31st, 1948; deferred payments not to bear interest. Any excess above $10,000.00 in any one installment payment shall be credited on the installment(s) next due. All such payments on the $40,000.00 balance shall be paid by second parties into the North Bend Office, Washington State Bank, at North Bend, King County, Washington, for and to the credit of first party.

Escrow: Upson the option being exercisdd above before described, first party agrees forthwith to execute a good and sufficient warranty deed to second parties of full possessory and mining title to said mining claims (unpatented) together with the appurtenant rights thereto above described, and to deposit the deed and a duplicate original of this option and purchase agreement with said bank in escrow. And said bank shall receive all payments on the purchase price thereafter made, and on final payment thereof shall deliver the deed and other papers in the escrow to second parties. Such escrow shall be irrevocable unless terminated or forfeited in accordance with the terms and conditions of this agreement or by written consent of both parties hereto. Each party shall bear half of the bank's escrow services charges; but first party shall bear its collection charges.

Before June 30th, 1947, first party agrees to furnish second parties, for examination, an abstract of title to said mining claims, showing good and marketable possessory title to the mining claims. If he fails so to do within such time, second parties shall have the right to do whatever is reasonable necessary to remove or acquire whatever adverse claims or clouds on the title there may be, if any, and to withhold out of the purchase price installment becoming due June 30th, 1947, a reasonable amount to cover such expense, the actual expense to be credited on the purchase price. After examination by second parties the abstract of title shall be deposited by them into said bank in the escrow.

Work: During the life of this purchase agreement seond parties shall be entitled to possession of the Property, and shall have the right to prospect, develop and mine the ground, and to appropriate all proceeds therefrom. And they shall have the right to carry on such work at such times, in such manner, and to such extent as they deem best; but they agree to perform all such work in a careful and miner-like manner, and properly and sufficiently timber all underground workings where nesessary, All work and operations shall be done by second parties at their own expense. However it is understood that second parties shall not be obligated to do any work or to construct anything on the premises.

At the time of making each semi-annual payment of the purchase

price, second parties agree to prepare and curnish first party with a sketch showing all development work done by then since first starting work.

First party shall at all reasonable times have the privilege of inspecting the premises and underground workings, taking measurements and samples of ore, either personally or through his authorized agents.

Surrender of Property: Second parties shall have the privilege of terminating this purchase agreement at any time, whenever in their judgment they find that they can not operate the ground profitable on account of labor, economic conditions, war, government (State or Federal) lasw or regulations, or other conditions, after first serving on or sending ny registered mail to first party a thirty (30) day written notice of intent to terminate this agreement for such reason(s) providing that at the time of giving such notide they are not in default in any payment due first party or in the performance of any covenant or agreement on their part, and jurther providing that they are acting in good faith.

Time: Time is of essence in the terms and conditions of said option and of this purchase agreement.

Liens: It is understood that the title and rights of first party are not subject to any liens for labor or material incurred by or through second parties; nevertheless it is expressly agreed that second parties shall not incur or allow to be incurred or filed in the Auditor's office of King County, Washington, any liens against the Property or any part on account of labor, material, taxes, State workmen's compensation, or otherwise. First party may for his own protection against clouds on title or hostile claims pay such liens, without affecting any other remedies he may have; in which event he shall have a lien against second Parties' equipment, supplies and improvements, no part os which shall be removed by second parties from the premises until first party is fully reimbursed. The provision herinafter relating to removal shall be subject to this provision.

Taxes: Second parties shall pay all taxes against the Property or any part for the year 1947 and subsequent years before they become delinquent, including taxes against all developments and improvements made by them.

Save Harmless: Second parties agree to save first party harmless on account of injury to person or property incurred by or through them or arising out of their care, use or operations of the Property or any part.

Use of Premises: During the life of the option and this purchase agreement second parties shall use the premises for mining purposes only. And they shall have the right to out and use for such purposes all reasonably necessary timber on the premises, and to use and appropriate all necessary water from the lakes and streams on the premises so far and in such manner as authorized by law.

Forfeiture clause: If second parties default in any payment on the purchase price, taxes or other payment required of them herein, or if they breach any covenant or agreement herein on their part, first party shall have the option of terminating this purchase agreement, after first serving on or sending by registered mail to them (addressed to them at the addresses below designated unless otherwise directed by any of them) a sixty (60) day written notice. And if within such time limit they fail to pay such overdue payment or payments ro to rectify the breach of covenant or agreement, then at the expiration of such notice this purchase agreement shall be absolutely terminated and for feited; in which event they agree forthwith to vacate and peacefully surrender possession of the premises, except so far as necessary to protect and remove their belongings below described. In case of such forfeiture first party may retain as liquidated damages all maneys theretofore paid by second parties on the purchase price or received by him.

Removing equipment: Upon the termination or forfeiture of this purchase agreement, second parties shall be allowed ninty (90) days, weather permitting, in which to remove from the premises all their equipment, supplies and improvements (except adit and underground timbering made by them); otherwise at the expiration of such time so much of same as remain on the premises shall become the property of first party.

Assigning agreement: Second parties shall have the right to incorporate and organize a mining company, consisting of themselves and associated, under the laws of this State, and to assign to it all their rights and interest in and under this option and purchase

agreement; but otherwise neither second parties nor said corporation shall have any right to assign said agreement without the written consent of first party. In case of proper assignment the assignee shall assume all responsibility thereafter under said agreement, and the assignor shall be relieved of further responsibility. This option and purchase agreement shall be binding upon the parties hereto, their lawful successors heirs and assigns.

Executed in tiplicate March 23 rd 19 46

at Seattle, Washington.

Albert PEARSON, as Trustee
Albert Pearson, 1317 7th Ave., Seattle, Wash.

EDWIN SAURERS,
Edwin Saurers, R. 3, Box 415-B, Bremerton, Wash.

C. L. JOHNSTON,
C. L. Johnston, 245 S. Montgomery St., Bremerton, Wash.

J. R. CRIPPEN,
J. R. Crippen, 1522 N. Lafayette St., Bremerton, Wash.

EDWARD HALL,
Edward Hall, P. O. Box 2413, Sheridan Park, Bremerton, Wash.

State of Washington,
ss.
County of King.

This is to certify that on this 23 day of March, 19 46, before me the undersigned Notary Public, personally appeared Albert Pearson, of Seattle, Washington, Edwin Saurers, C. L. Johnston, J. R. Crippen and Edward Hall, all four of Bremerton, Washington, to me kmowm to be the individuals described in and who executed the within instrument, and acknowledged to me that they respectively signed said instrument as their free and voluntary act and deed for the used and purposes therein mentioned; and said Albert Pearson acknowledged that he so signed and acknowledged the instrument as trustee.

In Witness Whereof, I have hereunto set my hand and official seal the day and year first above written.

M. H. VAN NUYS.
Notary Public in and for the state Of Washington, residing at Seattle, Washington.

NOTARY SEAL

Supplement to Bear Basin Mine Agreement

Whereas a written agreement dated March 23, 1946 for the purchase of a group of 25 contiguous unpatented lode mining claims, formerly known as the Snoqualmie Mine, now known as the Bear Basin Mine, situated in King Count, Washington, in Sections 13, 14, 23 and 24, Township 25 North, Range 10 East, W. M., on and near Bear Creek, was made by Albert Pearson, Trustee, as vendor, and by Edwin Saurers, Carl L. Johnston, J. R. Crippen and Edward Hall, all of Bremerton, Washington, as purchasers, for the purchase price of $50,000.00, payable in semi-annual installments; and whereas said agreement was on April 30 1946 assigned by said purchasers to a Washington corporation organized by them, the Bear Basin Mining Company, Inc., and whereas there has been paid to date on said purchase price $200.00 (initial payment) plus $25,000.00, all paid by said corporation, leaving the unpaid balance of the purchaseprice at the present time Twenty-four thousand, eight-hundred Dollars ($24,800.00; and whereas the option in said agreement was duly exercised;

Now, as part of said original agreement of March 23, 1946, itis hereby agreed between said Albert Pearson, Trustee, hereinafter called Trustee, and Bear Basin Mining Company, Inc., hereinafter called Company, as follows:

Company agrees to pay (into the escrow below described, for the benefit and credit of said Trustee) to apply on said unpaid balance of the purchase price, seventeen per cent (17%) of the gross proceeds hereafter received by Company from sale of its shares of stock (common or preferred), which 17 percent proceeds shall be withheld by Company and paid, as just described, on or before the second day of January of each year hereafter following the calendar year during which said proceeds were received by Company, the first such payment thus becoming due on or before January 2nd, 1952. However, in any event, Company agrees and guaranteed to pay into said escrow for the Trustee's benefit and credit, as minimum payments on the purchase price balance, the sum of Two-thousand, five-hundred Dollars ($2,500.00) on or before said January 2nd of each year hereafter, commencing January 2nd, 1952. Further, in any event, Company agrees and guarantees to pay into said escrow, as above described, the final unpaid balance of the purchase price on or before January 2nd, 1956. It is understood that said unpaid balance of the purchase price, $24,800.00, or any part thereof, is not to bear interest, except in case of default of any installment 5 per cent per annum.

Further, in lieu of the paragraph entitled "Escrow" on page 3 of said agreement of March 23, 1946, the following shall be substituted:

Said Trustee agrees forthwith to make and execute a good and sufficient deed to Company as grantee, conveying full possessory title to all said unpatented lode mining claims, free from any encumbrances (except encumbrances incurred by or through said four original purchasers or Company), subject to the paramount title of the United States, with appurtenances. Trustee agrees forthwith to deposit said deed, together with an original duplicate of said agreement of March 23, 1946 and of the present supplemental agreement, in escrow with the Seattle-First National Bank, Metropolitan Branch, of Seattle, Washington. Said bank shall receive any and all payments hereafter made by Company to apply on said unpaid purchase balance; and the Bank shall credit all such payments to the checking account of said Trustee in said Bank, which account the Trustee agrees to open at or prior to the time of first payment by Company to the Bank, Upon final payment of said unpaid balance of the purchase price, the Bank shall deliver to Company said deed and any other papers belonging to said escrow, except such papers as the Bank customarily retains for its own protection. Said escrow shall remain irrevocable unless forfeited or terminated in accordance with the terms and conditions set forth in said written agreement (in the secrow), or unless the escrow is terminated by written consent of both parties filed with the Bank. Each party shall bear half the escrow service charges of the Bank, but Company shall bear the Bank's collection charges.

In consideration of said Trustee having subsequent to March 23, 1946 borne the expense of a survey of said mining claims, it is

agreed that he shall not be obliged to furnish to Company any abstract of title or title insurance.

The following shall also be treated as part of said agreement of March 23, 1946;

Company agrees, before July 1, 1951, to complete and record (in the Auditor's office of King County, Washington) an affidavit of, assessment work required by law for year ending July 1, 1951 noon; and thereafter agrees to perform and record assessment work for each respective assessment year, prior to December 31st, of each such year, including December 31st, 1951. In the future if Congress passes any moratorium law in lieu of assessment work, Company agrees promptly to comply with such law, or to perform and record assessment work within the time above agreed.

This present supplemental agreement supersedes all written or verbal amendments ro modifications of said original agreement of March 23, 1946 heretofore made; it being the intent of the parties hereto that the whole existing agreement between them is contained in said original agreement and in the present supplemental agreement, and that said original agreement shall remain in full effect except so far as midified or changed by the present agreement.

Signed and dated March 30th 1951, by the parties hereto, with the corporate seal of Company hereto affixed.

Witness as to Albert Pearson

Albert Pearson, Trustee (Signed)

M. H. Van Nuys (Signed)

BEAR BASIN MINING COMPANY, INC.

Witness as to Company

M. H. Van Nuys (Signed)

By James R. Crippen (Signed)
President

Delbert W. Jenkins Jr. (Signed)
Secretary.

A REPORT ON THE
BEAR BASIN MINING COMPANY'S
PROPERTY
BEAR BASIN, BUENA VISTA, MINING DISTRICT
KING COUNTY WASHINGTON.

INTRODUCTION. The property of the Bear Basin Mining Company was visited by the author on August 25, 1950. Examination of the property and tunnels was made at that time.

The property is situated in an eroded glacial cirque the bottom of which has been filler with talus and erosional debris. A cliff surrounds the area extending upwards for five hundred to nearly a thousand feet. A creek, Bear Creek, flows through the area and would be a source of water power. This creek has not contributed much to the general erosion pattern.

The property is accessible from North Bend, Washington by following north on the North Fork Snoqualmie River road, thence up Lennex river on a county road, thence on a Mine to Market road. The total distance from North Bend is 24 miles. The roads are in reasonably good sondition.

From the intersection of the rpad with Bear Creek a trail teads to the property. The property at present is equipped with a commodious cabin adequate for six men. The trail could be replaced by a road with switchbacks.

The specific location of the property is in Sec. 13, 14, 23, and 24; T. 25 N.; R. 10 E.; W. M. The claims are in a contiguous group of 25 mining claims.

GEOLOGY. The geology of the region is reasonably simple. Erosion has removed the original cover of some thousands of feet and left exposed the granite complex. The rocks are granite of early Cascadian or pre Cascadian age. The predominant rock is hornblend-biotite granits, though this shows many modifications in amounts of dark minerals. The inherent color changes in the granite is due to these variations in the amount of dark minerals. The grain size of the granite is not uniform but does not extend through a very wide range.

DIKES. In the vicinity of the Number six and seven tunnels, on the north side of the basin, ther is a dike of uniform, or nearly so, granite that is devoid of all or most of the dark minerals. This can be classified as a binary granite or an aplite. The crystallization is a little course for a characteristic aplite granite but partakes of the nature on that type of rock. Undoubtedly this dike contributed to the mineralization in the area.

In Number eight tunnel there was the only pegmatite dike material that was seen on the property. Because the tunnel was partly filled with water it was not entered. The position and relation of this dike was not learned.

To the south of Number three tunnel there is a dike of basaltic andesite (see map). This is of a later date than the sulfide mineralization and probably has no influence on the economic value of the property though it may have assisted in late replacement.

Veins of mineral that are associated with dikes are usually deep seated and the ore can be expected to continue to considerable depth. These may be called dissure veins.

At a time after the granite had solidified and before the overlaying blanket had been eroded a series of parallel faults cut the granite in a general east west direction. These faults are approximately 230 to 500 feet apart. Each of these east west trending faults are mineralized. There is a change in mineral content and type of sulphide as one progresses from north to soulth. There is a second set of faults with a north west, south east trend; those will be described under mineralization. The third set of significant faults are barren and have a trend nearly normal to the mineralized faults.

In the first set of mineralized faults the displacement has been a downthrow in the north block with a lateral movement to the east. Each successive block has repeated this movement. Much work of a theoretical noture would be required to determine the amount of these movements and will have to be done or some part of it will have to be undertaken at a future date when the mining operation has reached approximately 2500 feet in Number six tunnel. However at that time the intersecting fault will be open and the problem will not present great difficulties.

The sequence of movement is showing by the mineralization. The east west trinding faults are the ones that are involved most directly in the process. These faults developed a large amount of fractured wall rock (fault breccia) between two faulted surfaces. Into this fractured zone was intruded much silica (quartz) and sulphides of iron and copper. The iron pyrite was the most characteristic however chalcopyrite was present. Very little sulphide was included in the silica which indicated that this early mineralization was in at least two generations. The general reaction was a low temperature deposition.

The second generation of mineralization was a replacement of the early sulphides by invading vapors and water carrying stibnite, jamesonite and a little gelena -- these minerals carry silver to a greater or lesser extent. They have replaced the sulphides of the earlier deposition. It is not uncommon in a polished section under the microscope to note a pseudomorth of stibnite that has assumed the characteristic cube of pyrite. This was an epithermal reaction of relative low temperature.

The third mineralizing period was the invasion of mesothermal solutions carrying ankarite (calcium manganese dolomite) and a lesser amount of manganese carbonite (rhodocrosite). This last stage in the mineralization replaced much of the fault breccia and the silica and finished the replacement of the early sulphides. The temperature of this invading solution was moderately high and under considerable pressure.

There is very small amount of molydbenite present but not in any significant amounts. However it is conceivable that the amount may increase and should be noted whenever found.

The tendency toward replacement is progressive from the north to south. Each vein showing a higher degree of mineralization replacement with a greater amount of antimony. The north veins represent a higher level in the geological column. This in the opinion of the author means that as depth is reached there will be a successive change in the mineral content of the vein with copper and zinc being the ultimate metal content.

The second set of faults belong to a movement taking place in the last stages of mineralization and cutting the earlier veins. The mineralization in these veins is confined largely to the gouge clays although some mineralization shows on the walls in Number six tunnel. The movement of these faults was a different type of movement with a very definite vertical somponent gringing the fault breccia to the claylike gouge. The net effect of this movement did not result in any great displacement. These veins will not be economical to mine except in favorable places where they are intersected by normal development in the course of the development of major tunnels. These faults showed in all the tunnels visited.

The third set of faults are post-mineralization and roughly parallel the first or mineralized faults so they are not significant in relation to the development of a mining operation in this area.

There are numerous small faults that cut the veins as revealed in the tunnels, and these are tear faults that usually occur in the downthrow block. Mineralization has extended into some of them and at their intersection with the main vein there has developed a strong ore shute or stack. These will serve as zones of enrichment in the general mining operation.

This type of faulting in massive uniform structured rosk is of deep seated origin. The nature of the veins indicate fissure type veins that maybe expected to continue to the depth. This is indicated further by the fact that the fault system in the lower valley is in all essential details similar to that in Bear Basin although the difference in elevation is approximately 3000 feet. The mineral change is as would be expected in these lower veins from theorectical contemplation.

The maps made by H. E. Bethel, Mining Engineer, and those made by Olin Sprague and Associated, Civil Engineer and Land Surveyer, have been used as the basis of all locations. Because Mr. Bethel used the same type of instruments as was used im my investigation it was more convenient to use his maps.

Tunnels three, five, six, seven, and eight were studied by the author in his investigation of the property as well as the outcrop above tunnel Number six and the cut above tunnel Number three. Snow still holding the summit area above Tunnel Number three made it inadvisable to try to follow that vein over the divide.

TECTONICS. As was suggested earlier in this report, the movements in the region of Bear Basin are not the movements that superficially represent the movements of the Cascades. The earlier geologists seemed to think that the Cascades were so broken by short and complex movements that there was no possibility that the Cascade mountains could yield any consistent economic development. This idea may be true for those areas where the younger formations are not removed by the great erosion of the glacial epoch. The Lennox river basin erosion has reached down to the granitic core of the Cascades and all movements that have taken place are fundamental to the mountain building process that uplifted the Cascades.

It is recognized by the author that the movements that occur in the valley of the Lennox river, at or near the Mine to Market road, are associated in origin to the similar movemants that have taken place in the Bear Basin.

It is the thought of some of the local miners that the fault within which the Silver vein reposes, continues through the mountain to the Cleopatra property. While the author has not been over the mountain following the Silver vein to the Cleopatra the author is somewhat familiar with the ore of the Cleopatra. From a study of the ore of the Cleopatra and the Bear Basin ores it would appear that there is sufficient similarity in their characteristice to warrant a conslusion that there origin was similar.

The same type of parallel faults spaced at about the same intervals, and the same general tendencies of the faults to pinch and swell is characteristic not only to the east into the Cleopatra but also westward as well. The mineralization varies a little from place to place, for instance the rhodocrocite is not common to the east but is to the west. The antimony represented by the stibnite and jamesonite is characteristic in both directions. Veins of this type and extent are recognized as persistend deep seated veins. All that remains to prove is the tenor of the ore body.

NATURE OF THE ORE. The ore in number three tunnel and that which is exposed in the open cut above the tunnel is a complex ore consisting of jamesonite, stibnite, and galena with lesser amounts of chalcopyrite and iron pyrite. This makes up the sulphide content of the vein rhodochrosite, tow types of ankerite iron dolomite and manganese dolomite, some calcite admixed with partly replaces wall rock, fault breccia, and vein quartz make up the non-sulphide or gangue portion. This ore is amenable to concentration by means of flotation or possibly by table or jig. The rhodochrosite (manganese carbonate) while it would always be secondary to the value of the sulphides it would have a definite economic value.

This vein is a replacement vein of epithermal to upper mesothermal origin having replaced the earlier sulphides of iron and copper. Probably the sulphides came in in at least two generations, the jamesonite at a higher temperature than the stibnite and galena. The rhodochrosite was the last to enter and at a lower temperature. These successive replacements removed the earlier sulphides of iron and copper except the traces that are left in protected zones.

All assays show a low gold content and a relatively high silver content. These metal ride with the sulphides of antimony probably, although some of the gold maybe free in the quartz or in the pyrite. This point has not been established.

The Alex vein, as shown in Number six tunnel, has a distinctly different mineralization to that shown in Number three tunnel. The vein represents a higher stratagraphic section than that represented by the Silver vein. The zone of replacement had just began. As this vein is sunk upon, the normal expectancy will be to go through a zone of high antimony mineralization and thence into copper and zinc at lower depths.

The composition of the veins lying between these to extreme positions displayed by the Silver and the Alex veins represent various stages of replacement.

From the imposing list of assays and from examining the areas from which the samples were taken it was deemed unnecessary for the purpose of this examination to take additional samples. The samples taken by Messrs. Bethel and Sprague are very representative of what can be expected. Mr. Bethel's assay map of the tunnels reveals the location of the zones of mineralization in a very satisfactory manner. As there has been no additional tunneling done in the interim and no new veins uncovered no additional information could be added by additional sampling at this time.

RECOMMENDATIONS. In view of the fact that there is no proven ore, that is, ore that is actually opened on four sides, a drilling program should be set up under the direction of a mining engineer or geologist. This will establish the amount and tenor of the ore body. If this program justifies the further development and the author believes that it will amply justify a resonable development these further steps should be taken:

1. Rebuild the sawmill to provide lumber for the necessary structures.

2. Build crew quarters.

3. Make a study of snow conditions to determine the location of the mill site. It. is my feeling that money and time can be saved by locating the mill farther down the valley where snow is not so deep.

4. As soon as quarters for the crew are ready than start a mining crew working cleaning the wall of Number three tunnel making it safe to start mining. This must be done under the supervision of a Mining Engineer. The ore thus accumulated can be piled until such time as it is needed.

5. Build the mill along the lines of the flow sheet submitted by the Denver Equipment Company laboratory test, or some similar recognized plan.

6. After the drilling program is finished on the Silver vein drill the Alex vein and on the basis of this information decide which vein will net the best returns.

Respectfully submitted,

F. A. McMillin (Signed)

Geologist

ORE TEST ON ALEX VEIN

The sample of ore from the Alex vein that was collected by me during my examination of the Bear Basin property has been crushed to 3/4" and cut with a standard Jones splitter. The mineral have been identified but without an attemp to determine the proportion of each present. Pyrite predominates; chalcopyrite, arsenopyrite and marcasite are the main sulfides resting in a gangue that is predominantly quartz with some feldspar (orthoclase) and both white and black mica.

The ore minerals occur as a disseminated replacement in the quartz. Most of the grains are small though in some places there are clots where some easily replaced mineral, such as calcite or sodic feldspar, has been entirely removed. These have been called vugs by some observers. However, there are no vugs showing in the wall rock. The replacing liquor removed more of the granitic minerals than there were sulphide minerals to replace that which had been removed by the permeating solution so the granite is very light and has a high degree of porosity for granite. The granite may be said to be approaching a greisen. This applies to both the granite and the aplite.

The anitmonides and the rhodochrosite so common in the "The Silver Vein" are entirely missing or very inconspicuous in the Alex vein. There has not been a complete chemical analyses made of the ore but very careful microscopic studies have been made.

Successive cuts were made and analyzed under the microscope with the following results:

1. Ninety percent or better freedom was obtained at 48 mesh. (Tyler Standard Screen Scale).

2. Flotation using a Denver Sub A 500 gram laboratory size machine. The pulp had to be cleaned by the use of a dilute acid and then sodium sulphide. This procedure was necessitated by the fact that the sample was taken from the dump where it had lain exposed to the weather for a number of years. This preliminary treatment would not have to be resorted to with freshly mined ore. Pine oil and zanthate were used as frother and collector.

The results showed a 14.7 concentration. By visual inspection of the tailings on a plack showed that very little sulphides were left behind. Som gangue hat had a coating of iron oxide on it that was not entirely removed by the acid treatment and was later converted to a sulfide by the addition of the sodium sulfide was raised with the ore minerals. This would be eliminated by the use of fresh ore. So the concentration could reasonably be expected to be 17 or 18 to one.

The same flow sheet that has been suggested by the Denver people would be adequate with modifications made under the advice of your engineer.

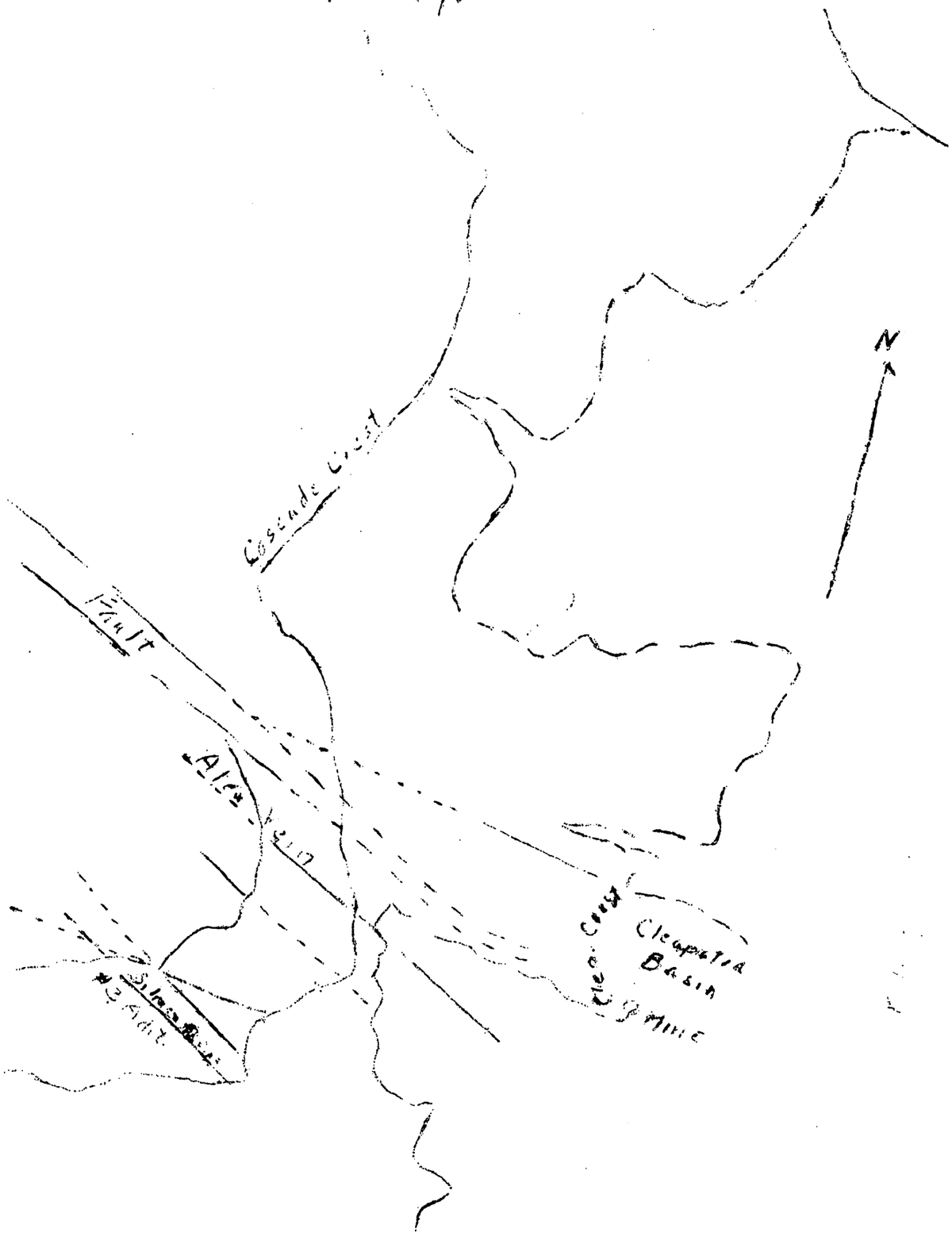
While this vein has most of its values in the copper and gold with very little value in silver it can be expected to strengthen in copper and gold and to pick up strenght in silver as lower levels are reached. The Alex vein in stratigraphically higher than the Silver vein.

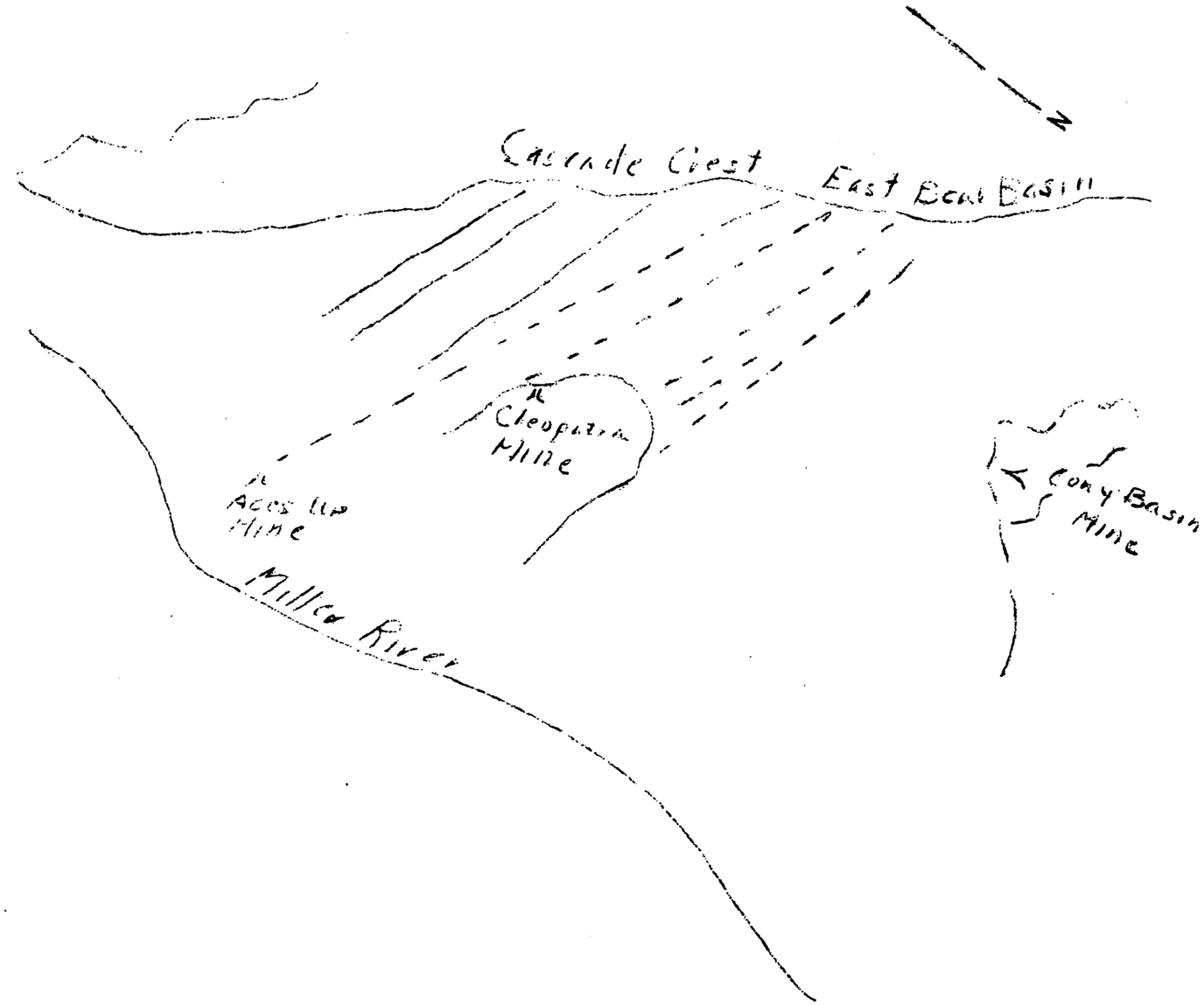
The reason for advising the development of the Silver vein first is because there is greater possibility for quicker returns in minded values. The Alex vein is equally as strong as the Silver vein but will require a more extensive development before returns can be expected.

GENERAL GEOGRAPHY. The accompanying map will show the extent of the vein system that is current in the Bear Basin as they are extended over the crest of the divide into the drainage of the Miller river. The Silver vein is not a part of the Cleopatra vein system but is to the east of the Cleopatra basin. The Alex vein is the continued one over the divide into the Cleopatra basin and is one of the same group as the Cleopatra. The Cleopatra shows strenght in the antimonides both stibnite and jamensonite -- both minerals carrying silver, but it is opened at a level some 1000 feet below the Alex vein. The Character of the mineralization on the Miller river side and again on the Lennox river valley shows what can be expected of the veins in the Bear B asin group upon depth.

This is a slight revision of view made after the study of aerial pictures and a visit to the Miller river area.

Bar Basin
Vein System




N
Cascade Crest
East Boat Basin
Cleopatra Mine
Aces Up Mine
Miller River
Cory Basin Mine

REPORT ON BEAR BASIN MINING CO.
Buena Vista Mining District
King County, Washington
By
H. L. Bethel, Mining Engineer

INTRODUCTION:

The Bear Basin Mining Company was incorporated in the State of Washington in 1946 to purchase and put into production a group of 25 mining claims, located in the Buena Vista Mining District, King County, Washington, in sections 13, 14, 23, and 24, Township 25N, Range 10E, W.M.

Approximately 1750 feet of drifting and crosscutting has exposed a series of nearly parallel veins spaced several hundred feet apart. Existing development work has exposed a high grade silver ore shoot on the Silver vein, and a larger, lower grade, mineralized zone on the Alex vein, and surface prospecting gives promise of additional ore shoots. In the Silver vein the chief values are in silver, with considerable gold, and additional values in lead and antimony, some of which will be recovered. In the Alex vein the silver values are less than in the Silver vein, but there is some copper in addition to lead which may be recovered.

LOCATION AND ROADS:

To reach the property one follows county roads from North Bend for 18 miles up the west side of the North Fork of the Snoqualmie river to the vicinity of Big Creek. From here the St. Paul and Tacoma Lumber Company has built a road on King County right of way and available to the mining companies for 4 1/2 miles up the south and east bank of the North Fork almost to the Lennox river. There is a half mile or less of existing unsurfaced road to the Lennox river, and from there the State of Washington will use mine to market funds to construct a road up the Lennox river, beyond Bear creek, to the confluence of the Lennox river and Cougar creek. The Bear Basin Mining Company proposes to connect to this road with a road up Bear Creek to the mining property, a distance of about 3 miles.

TOPOGRAPHY:

Most of the 25 claims are located within the amphitheatre shaped basin at the head of Bear creek. Bear creek occupies a typical step shaped glaciated valley, with relatively flat stretches of valley floor alternating with nearly vertical cliffs. The main floor of the basin, where the camp is located, is at an elevation of about 4500 feet, and is surrounded by vertical rock cliffs rising for about 500 feet. Behind these cliffs are gentler slopes and lesser basins, such as occupied by Bear lakes, followed by more

abrupt rises, finally culminating in sharp peaks at elevations of 5500 to 6300 feet. These ridges separate the Bear creek drainage basin from the North Fork of the Snoqualmie drainage area on the north, the Miller river drainage area on the east, and the upper Lennox river drainage area on the south. Most of the veins are exposed on the vertical face of the cliffs and, as a rule, being accompanied by faulting and somewhat less resistant to erosion than the intervening rock, form the courses for small waterfalls draining the upper snow and water sheds.

Timber is scarce on the higher peaks but considerable Alaska cedar and Noble fir mantle the lower basin floor. Snowfall is heavy in winter and usually leaves the basin floor in June.

HISTORY:

Most of the prospecting adits on the claims were driven by the Snoqualmie Mining Company which planned to mine the Silver vein through the No. 3 tunnel. They constructed a small flotation mill on Bear creek below the camp at an elevation of about 4300 feet. They installed a two bucket gravity tram, 1500 feet long, from the portal of the No. 3 adit to the mill. The equipment for the mill was hauled into place by donkey engine up Bear creek, and housed in a building constructed with timber cut on the claims. It consisted of a Traylor 5" x 11" jaw crusher, a 3' x 3' ball mill, and flotation equipment. The mine was not sufficiently developed to provide any amount of mill feed, and, as funds for development work were lacking, the mine and mill were subsequently leased to a local miner named Jones. He moved the aerial tramway to the No. 6 portal, but the mill burnt down before it could be put back into production, and no further work was done on the property until the Bear Basin Mining Company was formed and purchased the claims. The present company has had the claims surveyed, worked with other mines of the district in getting approval for a State of Washington mine to market road up the Lennox river, and is currently selling an issue of stock to finance development of the mine.

GEOLOGY:

The prevailing rock in this portion of the Buena Vista mining district is a coarse grained, massive, medium to dark colored granitic rock, containing quartz, feldspar, lots of black shiny biotite, some green hornblende, and has been generally classified as the Snoqualmie granodiorite. In the northern part of the basin, in the vicinity of the No. 6 and No. 7 tunnels, of an as yet undetermined areal extent, is a light colored, quartz and feldspar rich granitic rock, with very little biotite. In the vicinity of the Alex vein this rock contains numerous vugs up to 3 inches diameter,

filled with quartz crystals and coarse grained, friable sulphides, mostly pyrite. Due to its almost white color this rock is readily differentiated from the darker, biotite rich granodiorite.

These granitic rocks are traversed by a series of persistent, generally east and west striking veins or mineralized faults several hundred feet apart. The veins or fault zones are generally narrow but are remarkably persistent. The ones visible from the camp in the basin, and on which some work has been done, going from south to north, are the Silver vein, prospected by the No. 3 tunnel, the Pansey vein and No. 4 tunnel, the Dexter vein and No. 5 tunnel, an unnamed vein on which No. 8 tunnel was started, and the Alex vein, prospected by tunnels No. 6 and No. 7. All of these tunnels were driven at the foot of the steep rock cliffs above the talus slopes, at the head of the main Bear basin, between 4700 and 5000 feet elevation, and are shown on the accompanying sketch.

The veins or mineralized faults are characteristically marked by some gouge, some brecciation and silicification of the granitic walls, and variable amounts of quartz, sometimes manganese carbonates or oxides, and sulphides of lead, antimony, copper and silver. There are frequent intersections and branches of faults and veins both along the strike and dip. The widths of the veins are much greater at these intersections as in portions of the Silver vein and Alex vein as exposed in the No. 3 and No. 6 tunnels respectively. The Silver and Alex veins are the strongest. Since they differ appreciably they are discussed separately in detail below.

THE SILVER VEIN:

The silver vein outcrops on the south wall of the basin and has been developed by means of a drift which starts where the vein outcrops at the top of the talus slope and follows the vein for approximately 460 feet east. A strong, persistent fault accompanied by 2 to 8 inches of gouge occurs along the hangingwall side of the drift. For a distance of 60 feet from the portal this fault is bordered by 6 to 12 inches of alternately banded pink rhodochrosite (manganese carbonate) and quartz and gray sulphides of lead and antimony. Scattered through the rhodochrosite and also in the gray sulphides are irregular grains of silver sulphide.

Near the portal several faults intersect this H. W. fault at a small angle and one follows the footwall side of the drift for about 80 feet and is bordered by 4 to 8 inches of banded rhodochrosite and quartz and for a distance of 60 feet from the portal these hangingwall and footwall stringers, separated by 1 to 3 feet of brecciated granodiorite, make an ore shoot 3 to 5 feet wide. This ore shoot extends westward from the portal under the talus slope for an undisclosed

distance. At 44 feet from the portal a winze has been put down 22 feet and is in good ore at the bottom.

At 180 to 220 feet from the portal the Silver vein, striking S73°E is intersected by several faults striking S80°E and at this point the vein widens to several feet with 6 to 8 inches of high grade banded quartz, rhodochrosite, and sulphides, forming another smaller ore shoot.

Although the fault extends exceptionally strong to the end of the drift there are no more intersecting faults of sufficient strength or number to develop other ore shoots. A fault along the strike of this Silver vein to the east, and apparently marking the surface expression of this vein, is said to extend across the high ridge at the southeast corner of the basin over onto the Miller river side and down toward the high grade silver vein of the Cleopatra Mining Company. Approximately 1200 feet west of the portal of the No. 3 tunnel, in a small creek bed, on the rock slope above Bear Creek, at an elevation of 4610 feet, a series of closely spaced faults showing some black manganese oxide and carrying gold and silver values apparently marks the surface outcrop of the silver vein. The intervening distance between this outcrop and the No. 3 tunnel is covered with timber or rock slides. It is very probable that other ore shoots other than those exposed in the No. 3 tunnel exist along this length of the Silver vein.

THE ALEX VEIN:

In the No. 6 and No. 7 tunnels is exposed an extremely straight and persistent fault striking S 51 E and dipping 80 to the south. Approximately 50 feet to the south of this fault is another nearly parallel fault, almost vertical. Near where these two faults cross the contact between the biotite granodiorite and the light colored granitic rock there developed a strong diagonal shear between these two faults with much brecciation and silicification of the intervening granitic rock, and with small veinlets and bunches of iron pyrites, copper, lead and antimony sulphides. This zone is slightly wedge shaped as shown on the accompanying map of the Alex vein, being about 2 feet wide at the point of the No. 7 crosscut and about 7 feet wide at a point 150 feet east near the No. 6 crosscut. Also 4 to 6 inches of sulphides border the north fault for about 150 feet from this crosscut. The walls of the drifts show considerable green copper staining and water in the floor of the drift is green from the copper present in the ore.

ORE SUITABLE FOR MINING:

A sufficient amount of sampling was done to indicate the presence of high grade silver ore in the No. 3 tunnel on the Silver vein and a larger, but considerably lower grade, body of lead, copper, silver ore in the No. 6 and No. 7 tunnels on the Alex vein.

The portion of the No. 3 tunnel in ore is approximately 50 feet below the surface of the ground and part of this ore has been removed in a small open cut. Samples in this open cut and in the No. 3 tunnel show the ore shoot near the portal to assay 0.05 ounces of gold, 23 ounces of silver, 0.76% lead, and 1.24% antimony over an average width of 3.4 feet. Since this ore shoot extends right to the portal of the tunnel, with depth it will probably be found to extend to the west under the talus slope and should reach a length of 100 feet or more. Since the rock slides make it difficult to start a portal anywhere immediately down hill from the No. 3 tunnel, this ore will have to be developed by either continuing to sink the winze, now down 22 feet, or by a long lower tunnel starting in solid rock 300 to 400 feet lower and 1000 to 1200 feet distant. For the fresent sinking the winze is the safer procedure.

Dependent on the continuation of width and tenor of the ore shoot below the No. 3 level as it has for 50 feet above the level, each 100 feet of depth should yield approximately 2500 tons of high grade silver ore with possibilities of additional ore shoots to east or west. Under current prices this is valued at approximately $57,000 in gold and silver per 100 feet of depth.

The Alex vein offers a simpler mining and developing problem than the Silver vein since approximately 150 to 200 feet of backs is present over the No. 7 tunnel, and the exposed mineralized zone is larger than on the Silver vein. But since the silver values are considerably lower and copper and lead values more important than in the Silver vein, the returns from mining this ore are more dependent on the more variable base metal prices.

RECOMMENDATIONS:

From my examination of the property of the Bear Basin Mining Company I make the following recommendations:

1. Due to the excellent silver ore exposed in the No. 3 tunnel on the Silver vein, and the more spotty and base character of the ore in the Alex vein, it would be more advisable to start development work on the Silver vein.
2. The winze in the No. 3 tunnel should be extended down to 100 feet below the present tunnel level and drifts extended at least 150 feet east and west. Dependent upon the results of the drifting plans can be made for the movement of ore from the mine to a mill site. Either a lower level tunnel can be started from near the old mill site, approximately 1000 feet distant, or the gravity tram can be repaired and

returned to the No. 3 portal.

3. Since the ore shoots on the Silver vein are more or less dependent upon intersecting faults they are apt to be irregular in shape and distribution so that mine development work must be kept well ahead of mill requirements.

4. The most satisfactory milling procedure would appear to be the bulk flotation of all sulphides. This would give a maximum recovery of gold and silver with a very simple mill flow sheet. This should be checked by metallurgical tests done in an adequately equipped and manned laboratory.

5. Samples across a portion of the Silver vein in the open cut, 25 feet east of the portal, showed that the foot of banded quartz and rhodochrosite on the hangingwall and footwall assayed $43 and $77, respectively, while the intervening 3 feet of granite assayed only $0.72, so a sorting belt or table in a mill flow sheet whereby the granite was picked out as waste would allow a small 20 to 30 ton mill to do the work of a 40 to 50 ton mill by excluding an appreciable part of the mill feed as waste and raising the value of the heads.

6. Surface prospecting should be continued in an inexpensive manner, clearing outcrops where necessary and determining possible intersections of veins as favorable spots for finding high grade ore.

CONCLUSIONS:

The high grade silver ore exposed in the Silver vein of the Bear Basin Mining Company is very attractive under the current high price of silver. The persistence of the veins on the property over long distances and favorable geology indicate a potential good tonnage of ore. The veins in tunnels No. 4 and No. 5 and outcrops on the Dawson claim, not visited by the writer because of snow, offer additional possibilities of ore not discussed in this report.

Transportation facilities are being greatly improved over those existing at the time the previous operators worked the property, which will aid in the operation of the mine and mill.

I believe this to be a venture of exceptional merit, and an operation carried out along the lines recommended in this report should return a good profit to the company.

Respectfully submitted,

H. L. Bethel

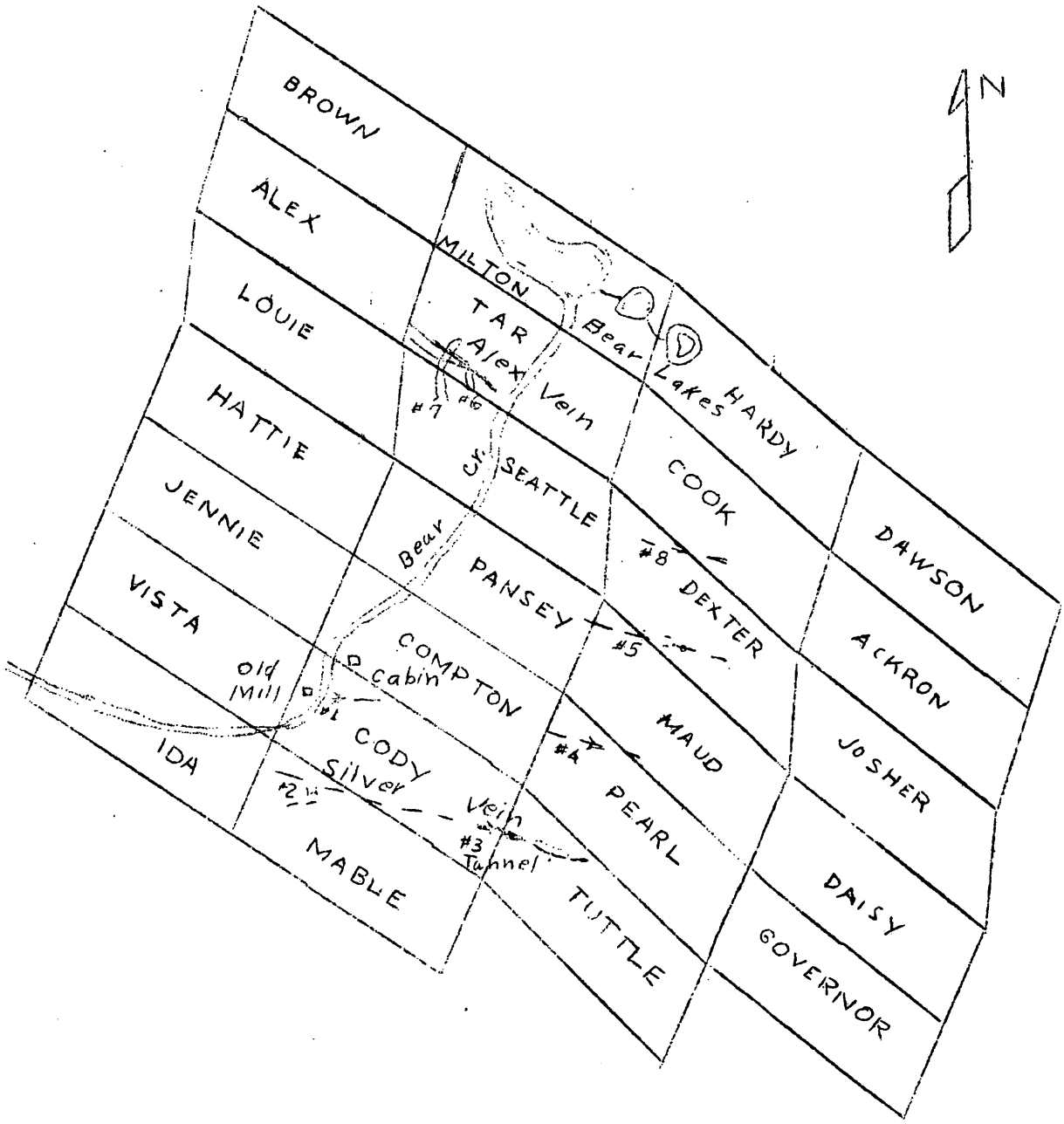
H. L. Bethel, Mining Engineer
Seattle, Washington
July 5, 1949

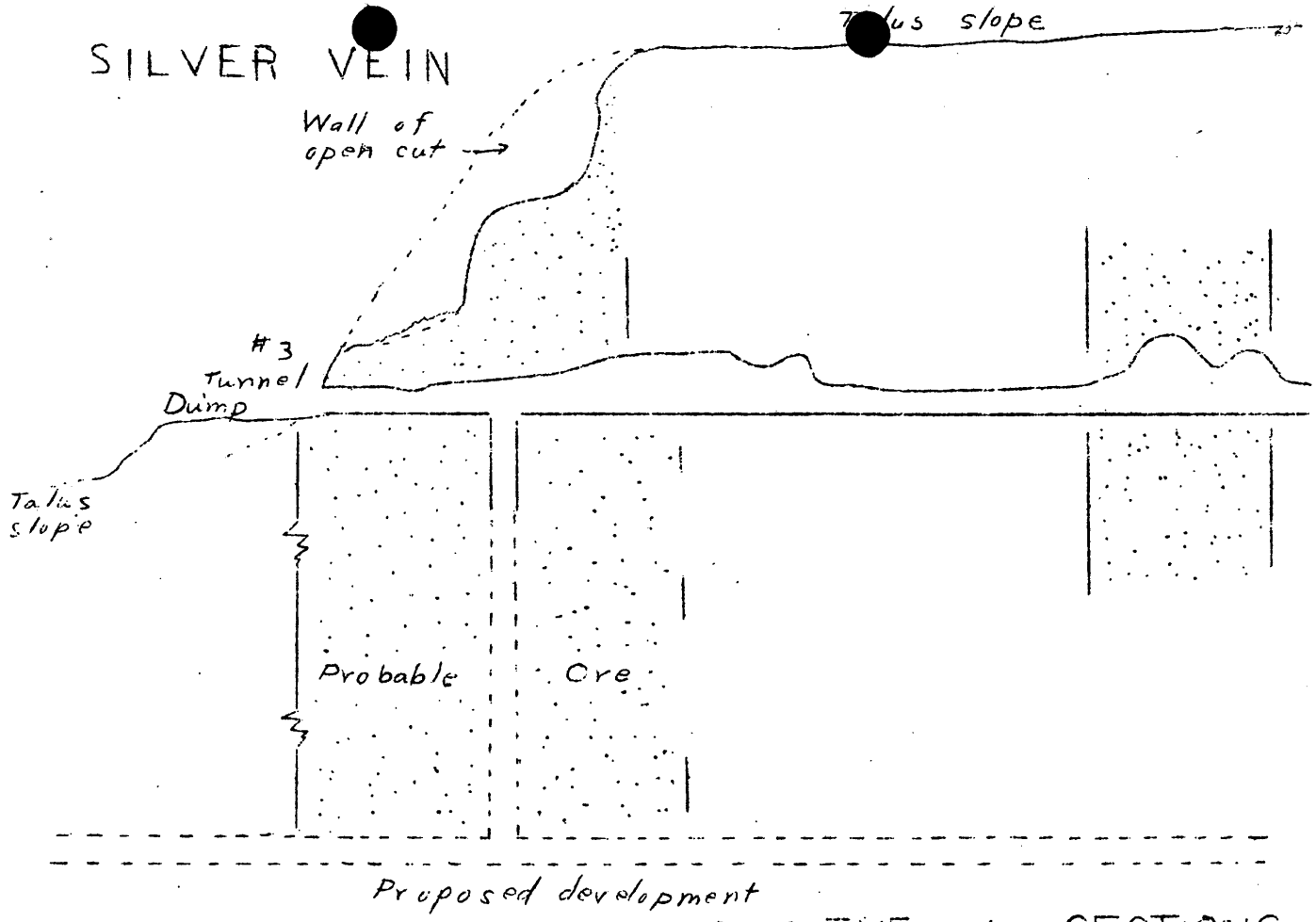
LOCATION OF PROSPECT TUNNELS ON VEINS OF BEAR BASIN MINING CO

Scale: 1 inch = 1000 feet

Date: June 1949

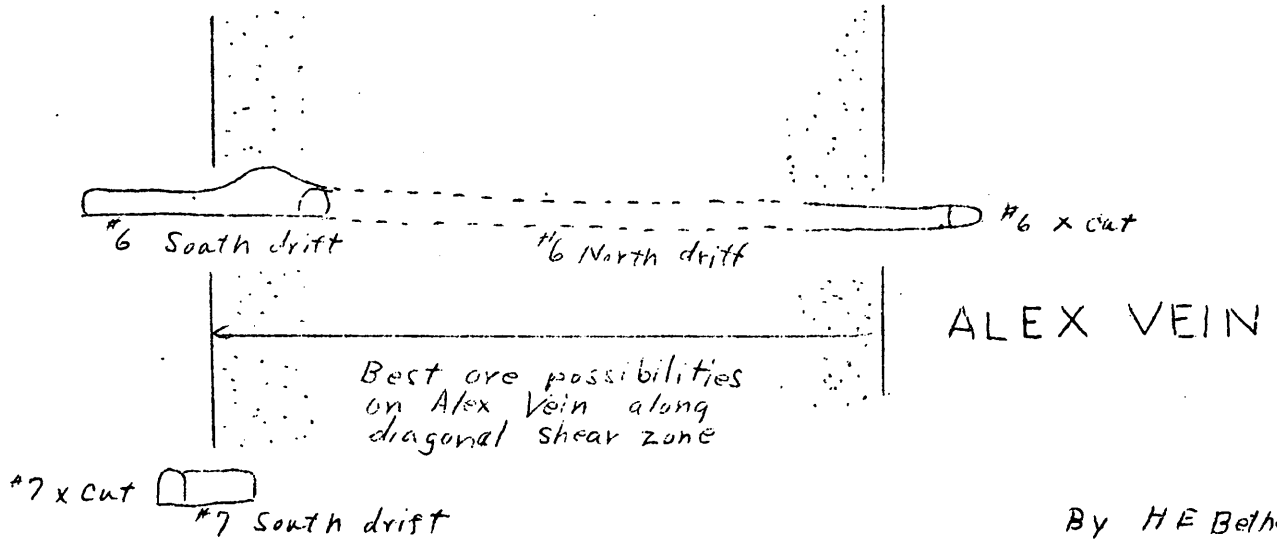
Note
Bearings of tunnels 4, 5, & 8 approximate





LONGITUDINAL SECTIONS

Approximate ground level Scale 1 inch = 40 feet

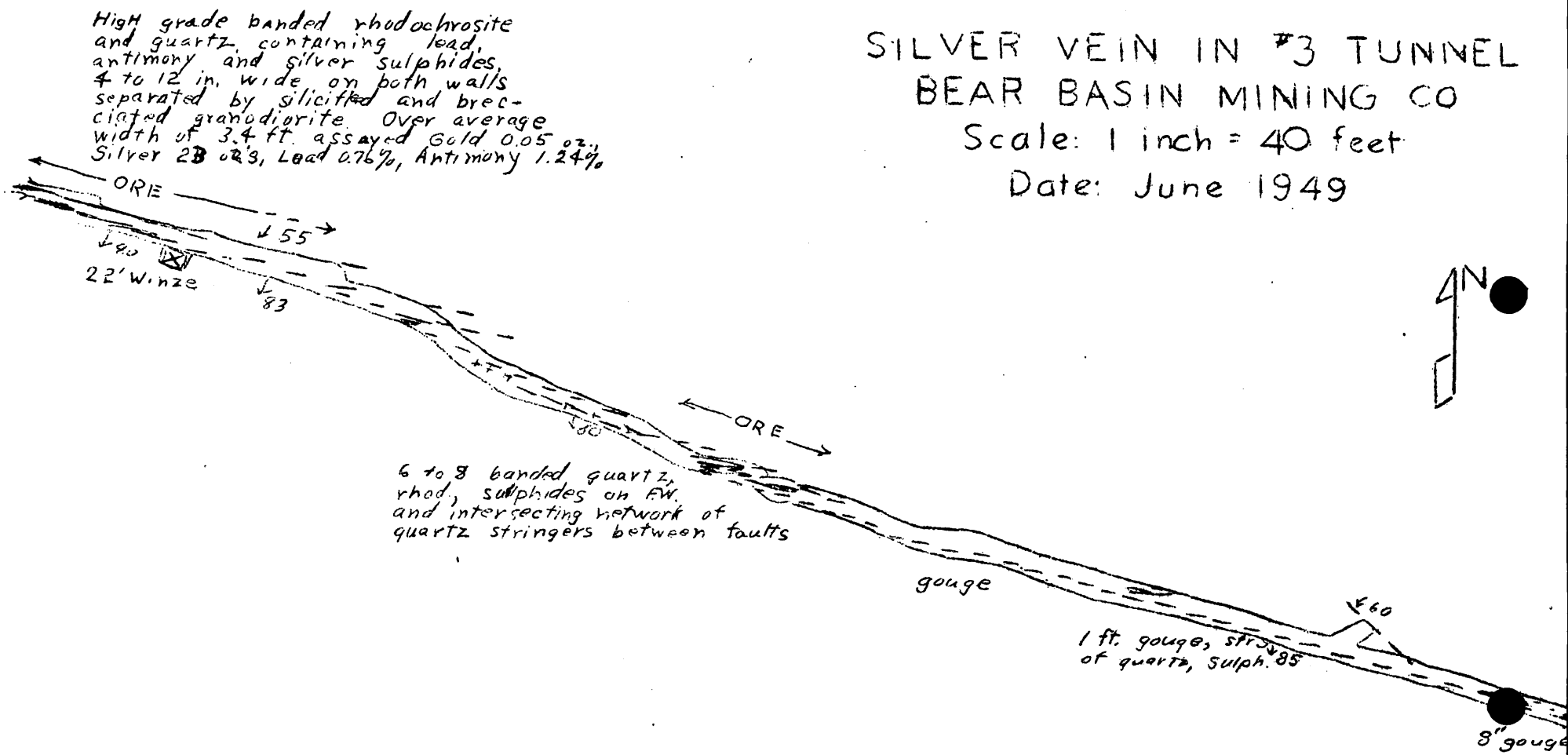


By H E Bethel

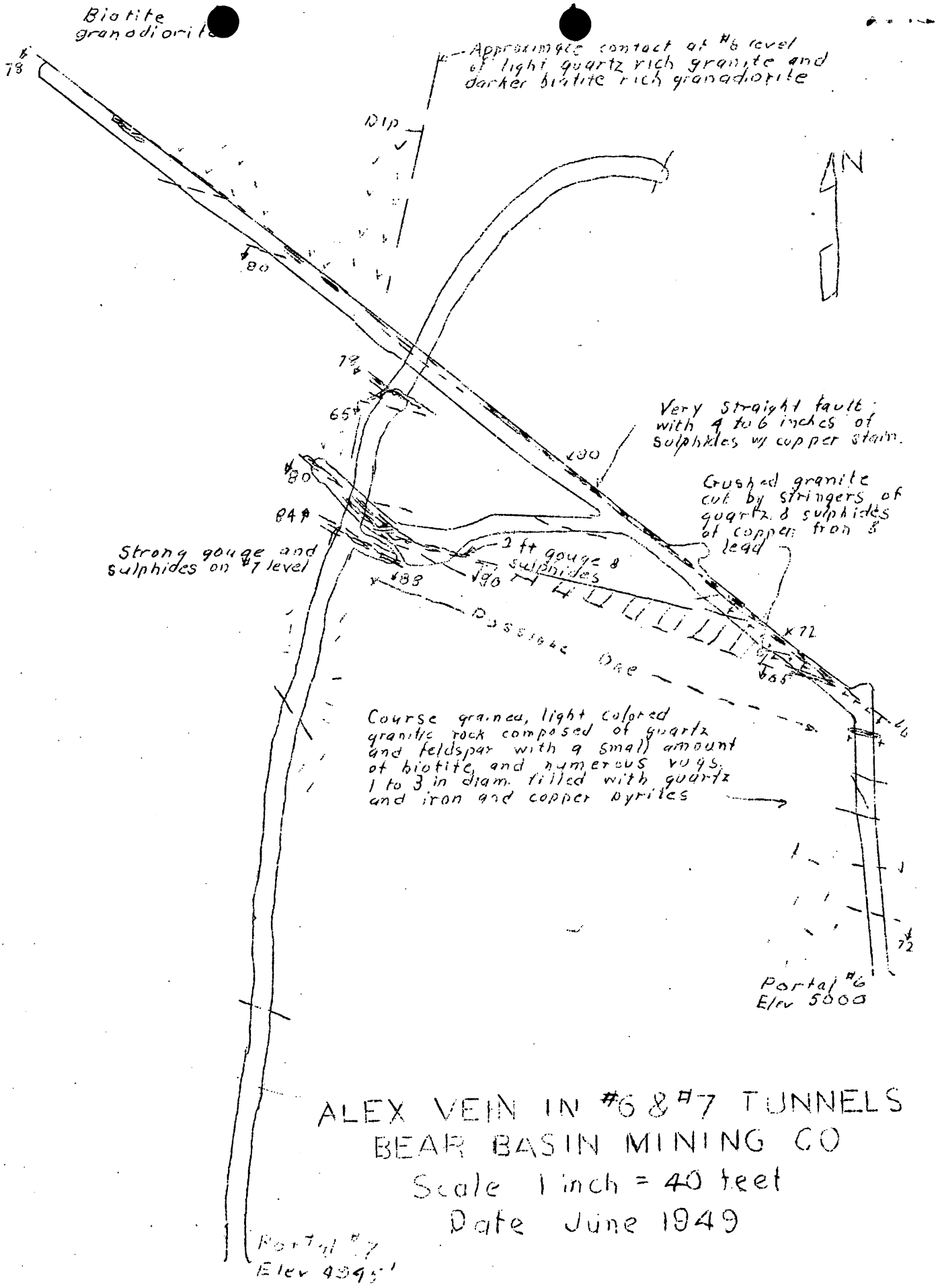
SILVER VEIN IN #3 TUNNEL
BEAR BASIN MINING CO

Scale: 1 inch = 40 feet

Date: June 1949



By H L B.



ALEX VEIN IN #6 & #7 TUNNELS
BEAR BASIN MINING CO
Scale 1 inch = 40 feet
Date June 1949

By H. L. Bethel

REPORT ON

CONSOLIDATED MOLYBDENUM, INC. HOLDINGS

IN THE BUENA VISTA MINING DISTRICT

KING COUNTY, WASHINGTON

by

OLIN M. SPRAGUE

Professional Engineer
641 N. Callow Avenue
Bremerton, Washington.

"BECAUSE THESE SECURITIES ARE BELIEVED TO BE EXEMPT FROM REGISTRATION, THEY HAVE NOT BEEN REGISTERED WITH THE SECURITIES AND EXCHANGE COMMISSION; BUT SUCH EXEMPTION, IF AVAILABLE, DOES NOT INDICATE THAT THE SECURITIES HAVE BEEN EITHER APPROVED OR DISAPPROVED BY THE COMMISSION OR THAT THE COMMISSION HAS CONSIDERED THE ACCURACY OR COMPLETENESS OF THE STATEMENTS IN THIS COMMUNICATION."

641 N. Callow Av.

Bremerton, Wash.

October 23, 1948.

At your request I have made an examination of the mining claims comprising the Consolidated Molybdenum, Inc. Mine property during October, 1948.

I am embracing my findings in the attached Report. This Report is based upon what I have seen, from certain recorded documents, maps, and from conversations with persons whom I consider to know whereof they have spoken.

The intent herein is to give an accurate description of the property with the purpose in mind of offering duly substantiated facts, or, at times, my conclusions based upon my observations, combined with written documents.

My purpose is to so place my statement of fact, that those interested in what I am saying will be able to draw correct conclusions relative to this Mining Property, upon reading and studying what is to follow.

Registered Professional Engineer.

CONSOLIDATED MOLYBDENUM INC. PROPERTY

The Consolidated Molybdenum Inc. Property is located in Section 27, Twp. 25 N., R. 10 E., W.M. in the northeastern part of King County, Washington. It is in the Buena Vista Mining District. Official Records of the property are kept in the County Auditor's Office, of King County, at Seattle, Washington.

Ownership is by Possessory Right, which, under United States and Washington State Mineral and Mining Laws, means that the claimant in possession can not be disturbed except by some one who shows a better right to the premises.

The present owner has possessed, occupied, and improved the property, and complied with the legal requirements since 1905, or thereabouts.

Claim corners are in place and the boundary lines marked in the usual manner.

There is a log cabin 18 feet by 18 feet conveniently situated upon the property: a good trail leading thereto, and a tunnel 5 feet by 7 feet in section. Some mining tools and cabin equipment.

The general appearance of the property is such as convinces one that the owner or claimant, has thru all these years, valued and cherished this property. The said owner shows by his toil and effort that he has continuously placed faith in the promise the property offers.

It might be further stated as a fact, that the toil and effort put upon the property has been purposeful, and pursued with a high degree of intelligence.

The orebody outcropping and in the tunnel, is a mass and a flaked Molybdenite in a large Pegmatite dyke. There is reason to believe that this property contains at least two other, and separate Pegmatite dykes.

ACCESSIBILITY

The route to the Consolidated Molybdenum Inc. property, starting from Seattle, is over U.S. Hiway No. 10, East to North Bend, some 29 miles, then northeasterly up the County Road following the North Fork of the Snoqualmie River some 26 miles. The 1 st 10 miles of this County Road has been built during 1948, and consists of a well gravelled road, built to support heavy traffic.

It is a Mine-to-Market Road on a right-of-way secured by King County thru Court condemnation. This right-of-way is secured to the Forestry Boundary, one mile further than constructed, and the Lennox Mine is at the further end of this uncompleted mile. Expectation of improvement of this last mile is thru cooperative effort of the owners of property contiguous to the Forestry Boundary and lying around the confluence of the Lennox River and the North Fork of the Snoqualmie.

From the Forestry Boundary, the State of Washington Mine-to-Market Road Commission has surveyed and located a route up the Lennox River some 4 and 1/2 miles, substantially following the old, existing

trail southeasterly to the mouth of Cougar Creek. Plans and specifications have been prepared for construction of this section of road up Lennox River, and contract for construction is shortly expected to be let by the State of Washington Highway Department. Completion of the road is expected, and specified in the Specifications, early in 1949.

The road when constructed will end at the foot of the slope rising to the south and approximately 3/4 mile north of the central part of Consolidated Molybdenum Inc. property.

From examination, access to the property from the end of the Mine to Market Road, as now located, will be upwards of 1 and 3/4 miles of road on a 9% grade, with perhaps one or two "switch-backs". This route would take off up the Lennox River and over a northeasterly slope affording ample way for sustaining the desired grade.

Ground is very good for road construction and with proper drainage should not present any difficulties. The route follows thru a timbered area; hence no snow slide trouble.

DESCRIPTION

The Consolidated Molybdenum Inc. property is a group of 10 claims, center lines of which extend from Cougar Creek South 52° East. The southerly string consists of 4 claims, each 1500 ft. up the mountain side and running from Cougar Creek South 52° East, 6000 ft. Northerly from and parallel and adjacent to this string, are two strings of 3 claims extending so that the southeasterly end lines of all three strings lie in a straight line. Another way of description is to say that 9 claims form a rectangle

4500 ft., or three claims, long, and extending South 52° East up the mountain, and three claims or 1800 ft. wide, at right angles to the slide lines across the upward slope. The tenth claim extends in line from the northwesterly part of the rectangular group downward to Cougar Creek - a handle on a rectangle.

The entire surface of the property is covered with a growth of Alpine and Noble Fir and Yellow Cypress. Some of the Cypress attains a diameter of 6 ft. indicating great age and the trees stand uninjured or deformed from any slides or other catastrophic agencies. This indicates a safe surface.

Along the general center line of the southwesterly four claims up the mountain, there is a canyon, rising on a slope of 35°, or 57 ft. per 100 ft. The walls are sheer granit and rise, in places, upwards of 100 ft. above the floor; the width of the canyon varies from 15 ft to 50 ft.

The floor from Cougar Creek to the top of the slope is a Pegmatite with quartz, lying in laminated formation - 2 to 6 inches of the Pegmatite with a quartz ribbon in between - 1/4 to 3 inches thick. These alternate ribbons fill the entire width between the canyon walls, and the Molybdenite ore is found in this floor formation.

A tunnel 5 ft. by 7 ft. in section is driven in this canyon, in the second claim, some 1200 ft. from and 600 or 700 ft. higher than Cougar Creek.

The portal is in the side of the canyon, safely out of the creek

bed and after traversing thru the granite wall, strikes the Pegmatite vein, 100 feet in, and under the northerly side of the vein. It then follows the vein for a distance of 100 feet to the tunnel face. The walls of the tunnel are impregnated with the Molybdenite ore.

Parallel to and northerly from the canyon there are two creeks flowing in small gulches, in which the same Pegmatite shows up. Their extent is at present undetermined, The indication is more than enough to warrant extensive investigation. A great deal of Molybdic Ocher coloration shows all along each of these creeks and Molybdic Ocher is an excellent guide to underlying Molybdenite deposits.

THE DEPOSIT

The strike of the veins on the Consolidated Molybdenum Inc. Property is South 52° East, the dip is 80° to 90°. The Pegmatite in the Canyon itself lies exposed from the upper edge of the talus above Cougar Creek, upward along the Canyon floor some 5000 ft. It varies in width from 15 to 50 ft. Pegmatites rise from very great depths, and are notorious for their irregular structure. Their depth range is so great that no mine starting on a productive Pegmatite is likely to reach a horizon too deep for further deposits.

Zonal arrangment of minerals within Pegmatite bodies is common, but these changes are usually symetrical with respect to the walls and to the center line, and are not expression of depth. This is to say that any change of mineral within the body takes place immediately across the section of Pegmatite, horizontally, and say, at right angles to the main axis of the

vein; it does not change vertically as in enrichment veins with their zonal arrangement, according to age and specific gravities.

This characteristic of Pegmatites is quite dependable, and applied to the Consolidated Molybdenum Inc. property we have a Pegmatite vein in depth from Elevation 3500 at Cougar Creek, rising thru the four claims South 52° East to Elevation around 6000, or a depth of probably 2500 ft. with no information as to depth below Cougar Creek bed.

Again, this same vein or a close relative strike off to the northwest on the same bearing of North 52° West over Goat Mountain to Sunday Lake and can be traced for two and one-half miles; where it crosses Goat Mountain about one mile northwest, it outcrops considerably higher than the apex of the Consolidated Molybdenum property.

This leads to the conclusion that here lies a tremendous body of ore.

IMPORTANCE OF MOLYBDENUM

The reasonable assurance of an ample deposit of ore brings up the question of - what gives this ore its importance? What is it used for? What is its value?

Molybdenite is composed of two elements, 60% molybdenum and 40% sulphur, and is also known as Molybdenum Sulphide. It is a soft, shiny, grey or black mineral usually in flakes or plates. Its hardness is 1, and specific gravity 4.8. A cubic foot will weigh up to 300 pounds.

Molybdenite is used as a lubricant; in its place, superior to

graphite, which it somewhat resembles. It is especially valuable around high-speed machinery and the moving parts of delicate instruments, as a lubricant. Refined, that is, Molybdenite with constituent parts separated-smelted, leaves the metal, Molybdenum. Molybdenum is used in steel alloys for high-speed tools, and steel and iron castings. It is found in the United States in Maine, New Hampshire, Washington, Colorado and New Mexico.

Its value exists both before and after smelting. Refining and concentrating is rather ticklish because of its specific gravity coming close to the copper pyrites which may be present in small quantities in the Pegmatite along its joints with the Host Rock. This examination has disclosed no pyrites but some is almost inevitable; however, the metal is recovered and the process is not an involved one as witness the present production.

The demand since World War II has greatly increased on account of new uses and wider distribution of consumption; the price is by the pound, at present about 16¢ a pound for the Molybdenite at the mine.

ASSAYS

Such data as to assays is, at this time, scant. The few samples reported upon show 1½% - 4% - 5% and one sample which returned 10%. This, roughly, gives 100 pounds per ton, or, say, $45.00 per ton. From all indications this does not seem unreasonable.

DEVELOPMENT

The matter of development on the Consolidated Molybdenum Inc. property is one that should be give utmost care. Access to the property at this time is over trails and roads, and by late 1949 every indication is that motor traffic will be available to within 3/4 of a mile from the present cabin.

The existing tunnel on the property appears to be in a well selected location. In this respect, it is not as criticism but as a suggestion, that a tunnel lower down toward Cougar Creek might be to a better advantage, as some 400 or 500 feet of elevation might better be utilized. The operating plan would control this matter. The mine looks as though it could be developed by working several levels.

The slope down to the bottom of the hill is straight and anywhere on a convenient spot, the mill should be placed; this is a control factor.

It seems, from present information, that ore might be transferred over aerial tram from the upper reaches to a mill close down by the road where it could be loaded onto trucks for shipping. The mill to concentrate and store for shipping.

There is good possibility of ample water power both in Cougar Creek and on Lennox River. Would suggest that this be with low head turbine. Machinery is more expensive but requires less construction - has a tendency towards getting everything "close-in".

Owing to the distance out, it would appear that camp buildings will be necessary; a cook house with commissary and, later, a superintendent's house with an office.

Mine timbers will be necessary, which may be cut from timber on the ground. This will probably work out cheaper if a small "portable mill" were set up at the start. Lumber and timbers could be cut from standing

timber on the property as required and around $25.00 per M. saved over market cost. It would also save unnecessary traffic over the road, which can interfere with ore shipment.

CONCLUSION

From the indications on Consolidated Molybdenum Inc. property it should be plain to anyone acquainted with the ore Molybdenite, and the rock Pegmatite, that here lies a very promising Mine Property. The potential tonnage would only be a wild, wierd guess at this time. It is certain that one vein some 5000 feet long, 15 feet wide, and average 1250 feet in depth exists and is in sight at a single glance. With two other veins not so plainly discernible but showing strong evidence of similar existence, it is too hypothetical at this time, to say anything more.

We know only partially what the bottom may be. The ore appears remarkably free from other metals than Molybdenum. The definite assurance of the road being built close to the Mine is an advantage few properties can enjoy. In short, every feature and circumstance pertaining to this property is enhancing its value.

Hypothetically estimating production for sake of further elucidation, let us assume one tunnel 5 ft. by 7 ft. the length of each string of claims. The total length of tunnel would then be

6000 ft. in the southerly string of 4 claims
4500 ft. in each of the two northerly strings, or
15000 ft. of theoretically productive ore.

then the volume of material would be

$$\frac{5 \times 7 \times 15000}{15 \text{ cu. ft. per ton}} \text{ OR } 35000 \text{ tons}$$

Average value of 35000 tons @ 5% or 100 lbs. Molybdenite per ton of ore would yield 3,500,000 lbs. of Molybdenite.

Such a vast quantity, even in theory, is staggering and should not, of course, be used in any reasonable estimates. But again, we have only considered depth at 7 ft. and there is likely to be 1200 or 1500 feet of depth, plus what may lie below the level of Cougar Creek Floor. Ore should be expected to such depth as Pegmatite may extend, and mined to such a horizon as the rock will stand, and Pegmatite extends to very great depth.

It should be remembered also, that Uraninite, found only in Pegmatites, is not an impossibility. No one knows for sure that this ore does not exist here on this property, and finding none would be no loss. No investigation has been made as far as we know. The basic conditions for Uranium, Thorium, and other rare metals exist in this Pegmatite, and is worth the test. The quantity of Molybdenite would soon pay the cost of such an investigation.

Then too, as characteristic in Pegmatite, there are quantities of clear quartz crystals in the rock around these dykes, Some observed, measured 3 inches long by 1 inch across. These, when clear, are valuable in lens making, and in radio and other industrial uses.

Accessibility and extent of the deposit make this property a very valuable one.

R. H. M. Sprague

Such a vast quantity, even in theory, is staggering and should not, of course, be used in any reasonable estimates. But again, we have only considered depth at 7 ft. and there is likely to be 1200 or 1500 feet of depth, plus what may lie below the level of Cougar Creek Floor. Ore should be expected to such depth as Pegmatite may extend, and mined to such a horizon as the rock will stand, and Pegmatite extends to very great depth.

It should be remembered also, that Uraninite, found only in Pegmatites, is not an impossibility. No one knows for sure that this ore does not exist here on this property, and finding none would be no loss. No investigation has been made as far as we know. The basic conditions for Uranium, Thorium, and other rare metals exist in this Pegmatite, and is worth the test. The quantity of Molybdenite would soon pay the cost of such an investigation.

Then too, as characteristic in Pegmatite, there are quantities of clear quartz crystals in the rock around these dykes, Some observed, measured 3 inches long by 1 inch across. These, when clear, are valuable in lens making, and in radio and other industrial uses.

Accessibility and extent of the deposit make this property a very valuable one.

E. L. M. Sprague

DENVER EQUIPMENT COMPANY
ORE TESTING DIVISION
Denver, Colorado

February 16, 1950

Bear Basin Mining Company, Inc.
641 North Callow Ave.
Bremerton, Washington

Attn: Mr. James R. Crippen

Ref: Ore Test AN-13288

Gentlemen:

We are pleased to submit the following report of the results of ore tests conducted upon your sample of complex silver-lead-antimony ore.

SAMPLE IDENTIFICATION

We received on November 11, 1949 one sack of ore sample via prepaid express, having a total weight of 90 pounds and marked from Bear Basin Mining Co., 641 No. Callow, Bremerton, Washington.

PREPARATION OF SAMPLE

The entire sample which consisted mostly of lump ore with pieces about 2½" in size was crushed to minus 3/4" and the product split by means of a Jones Sampler. One half was further crushed through rolls to minus 1/4" and this product again split. One portion of the minus 1/4" product was further crushed through rolls in closed circuit with the Denver Dillon screen to minus 10 mesh and a head sample and test charges cut from this portion. All reject portions were reserved for possible future use.

OBJECT OF TESTS

The object of the tests is to determine the amenability of the ore to concentration by flotation to produce a lead-silver concentrate. It is estimated that a recovery of 90.0 percent of the silver will be necessary for economic operation. The presence of arsenic, antimony and zinc in the concentrate will affect the marketability of it. Haulage of the concentrate to market will be expensive.

DESCRIPTION OF ORE

The ore represented by the sample tested is a complex carbonate and silica gangue ore containing complex sulphides, arsenides and antimonides. The carbonates present are rhodochrosite, calcite and magnesite. The sulphides are an intimate mixture of Jamesonite, galena, arsenopyrite, stibnite, sphalerite, pyrite and undetermined copper sulphides. Appreciable silver values occur with the sulphides and low gold values are present.

ALL RECOMMENDATIONS AND OPINIONS EXPRESSED IN THIS REPORT ARE BASED ON DETAILED PROCEDURES OF THE LABORATORY OF THE DENVER EQUIPMENT COMPANY AND APPLY ONLY TO THE MATERIAL TESTED. MAY BE CONFORMING TO THE SAMPLE FURNISHED BY THE DENVER COMPANY

DENVER EQUIPMENT COMPANY
ORE TESTING DIVISION
Denver, Colorado

AM-12388

The ore has a specific gravity of 2.9 and when the finely crushed sample is pulped with an equal weight of Denver City water having a pH of 7.4, it produces a pulp water having a pH of 7.0.

Following is a partial chemical analysis and assay of the head sample:

Ounces per ton gold	0.02
Ounces per ton silver	37.00
Percent lead	1.04
Percent zinc	0.12
Percent copper	0.11
Percent iron	3.55
Percent arsenic	1.55
Percent antimony	2.20
Percent insoluble	65.04
Percent sulphur	2.50

RESULTS OF TESTS

The results of laboratory tests conducted upon the submitted sample of ore are shown on the attached data sheets numbered D-1 to D-5 inclusive. In addition to these results, trial flotation tests were conducted in the laboratory, the results of which were determined by visual examination of panned products with the aid of a binocular microscope. These trial tests indicated that no separate concentrates of lead, antimony or zinc were obtainable on account of the floatability of these minerals. Consequently concentrates by gravity and flotation were produced of all the sulphide content.

Following is a description and resume' of the tests reported.

TEST NO. 1 — DENVER "SUB-A" FLOTATION FOLLOWED BY GRAVITY TABLE CONCENTRATION

This test was conducted to produce two separate grades of concentrate to show the effect of the reagents used. Flotation concentrate no. 1 was produced by the use of xanthate and pine oil in an alkaline pulp. This concentrate was cleaned by reflotation to produce a final concentrate of high grade. Concentrate no. 2 reported as a scavenger concentrate was produced to show the effect of additional flotation time and additional activator for antimony minerals. The flotation tailing was subjected to gravity table concentration and the tailing screen analyzed.

The results of the test show the production of a No. 1 Concentrate at a ratio of concentration of 14.3 to 1 which assayed 405.0 oz./ton silver, 8.45% lead, 14.3% antimony, 8.47% arsenic, 2.87% zinc and 1.15% copper. Cleaning of this concentrate by reflotation as would be accomplished in

a regular Denver "Sub-A" flotation circuit raised the grade of the concentrate to 898.0 oz./ton silver and 10.06% lead and the other metals in proportion. The resulting cleaner middling when subjected to refloatation would be expected to produce most of its valuable content in final concentrate form.

The scavenger concentrate produced assayed 104.0 oz./ton silver, 1.27% lead, 0.30% zinc, 0.18% copper, 5.77% arsenic and 11.8% antimony and contained 17.39 percent of the total silver and 9.99 percent of the total lead.

Table concentration of the flotation tailing failed to produce any commercial grade of concentrate.

The total recovery of the test determined by combining the total rougher and scavenger concentrates was 92.7 percent of the total silver and 89.59 percent of the total lead.

The assay of the plus and minus 100 mesh size fractions of the table tailing shows that no economic gain would result in grinding the ore to a finer mesh.

TEST NO. 2 — **DENVER MINERAL JIG, UNIT CELL AND DENVER "SUB-A" FLOTATION**

This test was conducted to show the amenability of the ore to concentration with the Denver Mineral Jig and Unit Cell in the grinding circuit followed by Denver "Sub-A" Flotation. A somewhat coarser overall grind of the ore was used in this test.

The test produced a Denver Mineral Jig concentrate at a ratio of concentration of 22.7 to 1 which assayed 251.0 oz./ton silver, 6.08% lead, 0.51% copper, 3.24% zinc, 4.57% arsenic, 10.73% antimony, 7.85% iron, 22.72% insoluble and 11.74% sulphur and which contained 28.3 percent of the total silver and 26.04 percent of the total lead.

The unit cell concentrate was produced at a ratio of concentration of 24.3 to 1, assayed 425.8 oz./ton silver, 9.73% lead, 0.85% copper, 6.10% zinc, 9.73% arsenic, 17.44% antimony, 14.10% iron, 10.80% insoluble and 32.80% sulphur and contained 44.96 percent of the total silver and 39.03 percent of the total lead.

A cleaned flotation concentrate was produced from the Unit Cell tailing at a ratio of concentration of 31.25 to 1 which assayed 221.4 oz./ton silver, 7.3% lead, 0.46% copper, 8.80% zinc, 15.28% arsenic, 12.8% antimony, 18.35% iron, 9.48% insoluble and 23.80% sulphur and contained 18.15 percent of the total silver and 22.74 percent of the total lead.

The total combined Denver Jig concentrate Unit Cell and Denver "Sub-A"

flotation concentrates represent a ratio of concentration of 8.52 to 1, have a combined assay value of 304.0 oz./ton silver, 7.7% lead, 0.82% copper, 5.67% zinc, 9.3% arsenic, 13.9% antimony, 12.9% iron, 14.9% insoluble and 18.9% sulphur and contain 91.42 percent of the total silver and 87.81 percent of the total lead.

Some small additional recovery can be expected from retreatment of cleaner middlings.

ADDITIONAL ENGINEERING DATA

The ore represented by the sample tested has a grindability classed as "Medium" when compared to our standard grind test ores. Grinding to minus 48 mesh is recommended. Thickener capacity for thickening the flotation concentrates should be provided on the basis of 10 sq. ft. of surface area per ton of concentrates which will provide some storage ahead of the filters.

A Filter having effective filter area to filter 500 pounds of concentrate per square foot per 24 hours will be required.

RECOMMENDATIONS AND CONCLUSIONS

The flowsheet recommended for treatment of the ore represented by the sample submitted is shown on Print No. A-4083. This flowsheet is designed to produce the highest recovery of values with the least amount of equipment since the Denver Jig and Unit Cell are shown to produce 72.75 percent of the total concentrates recovered and will thus replace a number of flotation cells which would be required if straight flotation were used.

The reagents recommended are those used in Test No. 2. However, if the amount of stibnite in the head ore should increase above that in the sample tested, lead nitrate would aid in its recovery. From 1/2 to 1 pound per ton of ore of the lead nitrate should be sufficient. The tests show that while a considerable amount of concentrate can be produced that will assay about 900 oz./Ag per ton, in order to make maximum recovery a grade of 300 to 400 oz./Ag per ton would be produced.

The flowsheet shows double cleaning of the flotation concentrate while in the tests only one cleaning was used on account of the small amount of concentrate produced in a batch test. This double cleaning should result in higher grade concentrates than shown by the tests.

Care should be taken that the grinding circuit is not over activated or over frothed which would result in lowering in grade of the Unit Cell concentrate. Two sets of reagent feeders are therefore recommended; one bank to feed the four reagents to the ball mill and another bank feeding xanthate

and pine oil to the rougher flotation feed.

The marketing of the concentrate which will contain a considerable content of arsenic and antimony will require some investigation. Two possibilities are available for investigation. The concentrates produced in our tests appear to be quite similar to those being produced by the Sunshine Mining Co. near Kellogg, Idaho. The market being used by that company might be investigated. Sintering of the concentrate would remove most of the arsenic and a considerable amount of the antimony. One mill to our knowledge had no difficulty in marketing a sintered gold-silver-lead concentrate after sintering on a hand-operated hearth using sawdust as the fuel. Arsenic content was reduced from 23.0% to 4 or 5% and antimony from about 9.0% to about 5% by this means. Local conditions would of course need be considered since such an operation cannot be conducted in a U.S. forest reserve and cheap fuel supply would be required. A proper site would need be selected so no damage to vegetation would result.

An investigation of the possibilities of sintering of concentrates is not within the scope of this order and if such an investigation should appear to be justified a semi-pilot plant test would be necessary to produce enough concentrate for this purpose.

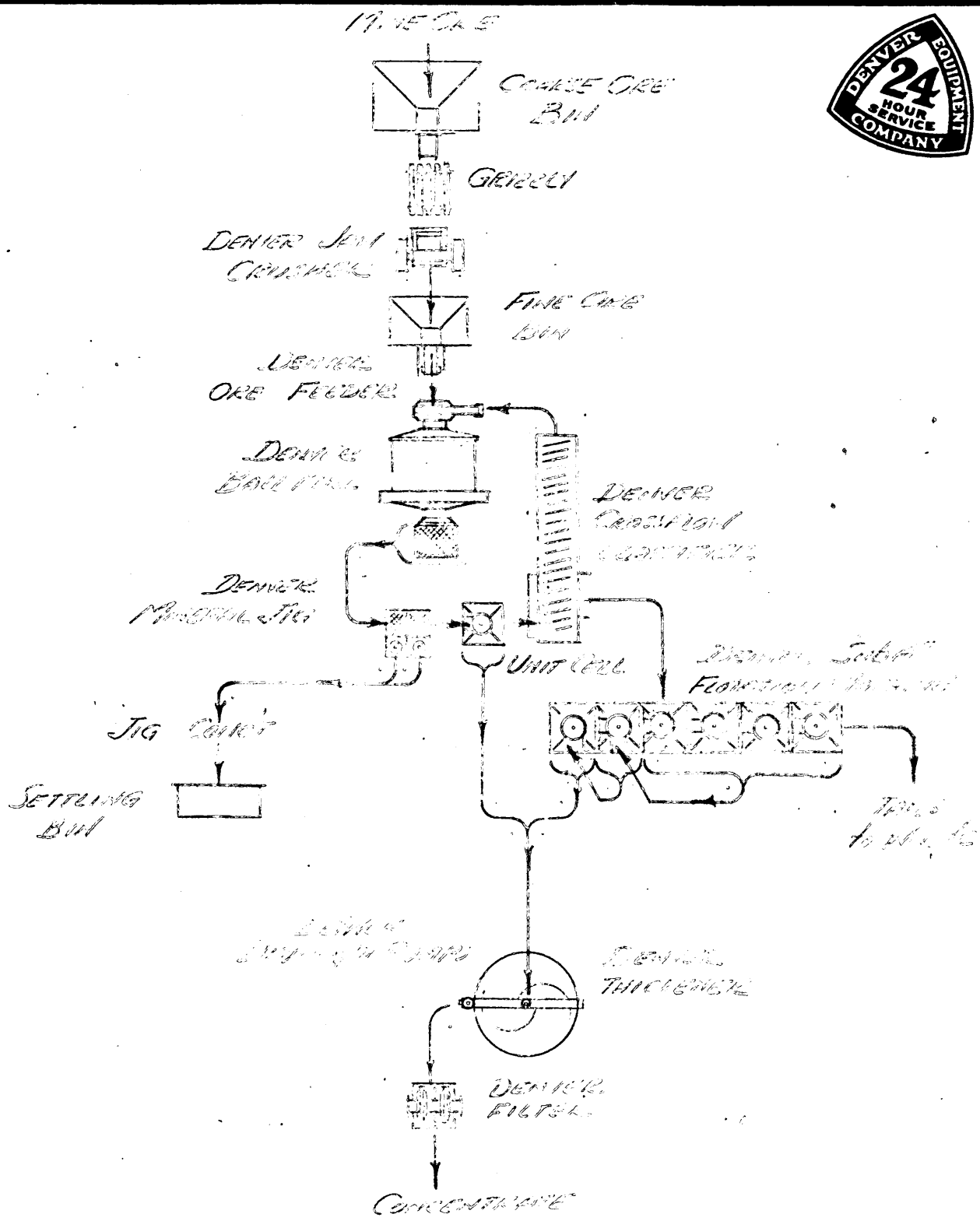
Respectfully submitted,

DENVER EQUIPMENT COMPANY

Clarence Thom, Director
Ore Testing Division

Henry J. Gisler, Manager
Ore Testing Division

Three copies to customer.



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PRINTED [redacted] ORDER NO. [redacted]

DENVER EQUIPMENT CO.
1400 - Seventeenth St. - Denver, Colo.

SCALE

DRAWN BY

CHECKED BY

A-

REPORT NO. AW 13388 TEST NO. 1

HEAD ORE CRUSHED TO MINUS 10 MESH

	oz/Ton Ag	% Pb	% Zn	% Cu	% As	% Sb	PERCENT RECOVERY Ag	Pb
HEAD SAMPLE ASSAY	— 37.00	1.04	0.[illegible]	0.11	1.66	1.20		
CALCULATED HEAD ASSAY	100.00 34.92	0.74	—	—	—	—	100.00	100.00
FLOT CLEANER CONCT.	2.60 898.00	19.06	3.12	2.60	1.93	29.18	66.86	66.69
FLOT CLEANER MIDDS	4.40 67.10	2.18	2.74	0.30	12.34	5.18	8.45	12.91
SCAVENGER FLOT CONCT.	5.84 104.00	1.27	0.30	0.18	5.77	11.80	17.39	9.99
TABLE CONCT.	1.20 12.70	0.63					0.44	1.02
TABLE MIDDS	4.20 6.40	0.20					0.77	1.13
TABLE SANDS	41.00 2.60	0.10					3.05	5.52
TABLE SLIMES	40.76 2.60	0.05					3.04	2.74

Grinding and Flotation — Reagents Pounds per ton heads %

	Time Hours	Pulp %	pH	S.A.	Z-5	P.O.	$PbNO_3$
	20	65	7.4	2.0	—	—	—
ROUGHER FLOTATION	8	29	7.4	—	0.20	0.06	
CLEANER FLOTATION	2	8	7.4	—	—	—	—
SCAVENGER FLOTATION	3	27	7.4	—	0.05	0.02	1.0

NOTES: Machine prepared to Denver "Sub A" Laboratory Flotation Machine

Screen Analysis Mesh	% Wt.	Flotation Tail Cum % Wt.
+65	2.0	2.0
+100	7.1	9.1
+150	12.8	21.9
+200	11.3	33.2
-200	66.8	
	100.0	

20
65
—

S.A. - Soda Ash
Z-5 - Potassium Amyl Xanthate
P.O. - Pine Oil
$PbNO_3$ - Lead Nitrate

T-1

DENVER EQUIPMENT COMPANY -- ORE RESEARCH DIVISION DENVER, COLORADO

REPORT NO. AM13388

HEAD ORE CRUSHED TO MINUS 10 MESH

	PRODUCT	Percent Weight	ASSAYS oz/ton Ag	%Pb	%Zn	%Cu	%AS	%Sb	PERCENT RECOVERY Ag	Pb
	Head Sample Assay	--	37.00	1.04	0.18	0.11	1.66	1.20		
	Calculated Head Assay	100.00	34.92	0.74	—	—	—	—	100.00	100.00
(1)	Flot Cleaner Conct	2.60	898.00	19.66	3.12	2.60	1.93	29.18	66.86	66.66
(2)	Flot Cleaner Midds	4.40	67.10	2.18	2.74	0.30	12.34	5.18	8.45	12.91
(3)	Scavenger Flot Conct	5.84	104.00	1.27	0.30	0.18	5.77	11.80	17.39	9.99
(4)	Table Conct	1.20	12.70	0.63					0.44	1.02
(5)	Table Midds	4.20	6.40	0.20					0.77	1.13
(6)	Table Sands	41.00	2.60	0.10					3.05	5.52
(7)	Table Slimes	40.76	2.60	0.05					3.04	2.74
	Combine 1, 2 & 3	12.84	252.13	5.19					92.70	89.59
	Combine 4, 5, 6 & 7	87.16	2.92	0.09					7.30	10.41
	+100 Mesh Table Sands	17.00	3.80	0.15					25.3	38.06
	+100 Mesh Table Sands	83.00	2.30	0.05					74.7	61.94
		100.00							100.00	100.00

Additional Head Assays Au -- 0.02 oz/ton, Fe -- 3.55%, Insol -- 65.04%

Head ore crushed minus 10 mesh.

None

A charge of 2500 grams of head ore crushed to minus 10 mesh was passed over the Denver Laboratory Mineral Jig two successive times producing a combined concentrate comparable to the use of a Duplex Denver Mineral Jig. The combined jig concentrate was assayed and the jig tailing reserved for Unit Cell and Denver "Sub-A" flotation, the results of which are shown on page D-4. Additional assays are shown on page D-5.

		Oz./Ton			
		Ag	% Pb	Ag	Pb
Head Sample Assay		37.00	1.04	—	—
Calculated Head Assay	100.0	39.02	1.03	100.0	100.0
Denver Jig Concentrate	4.4	251.00	6.08	28.30	26.04
Denver Jig Tailing	95.6	29.25	0.793	71.70	73.96

DENVER MINERAL JIG TAILING FROM TEST 2-A

AN-13388 2-B

		oz/ton Ag	% Pb	% As	% Sb	% Cu	% Zn	Ag	Pb
Calculated Jig Tailing	95.6	29.25	.793	-	-	-	-	71.70	73.96
Unit Cell Concentrate	4.12	425.80	9.73	9.73	17.44	0.85	6.10	44.96	39.03
Cleaned Flotation Conct.	3.20	221.40	7.30	15.28	13.80	0.46	8.50	18.16	22.74
Flot. Cleaner Middling	1.92	44.1	2.02					2.17	3.78
Flotation Tailing	86.36	2.9	0.10					6.41	8.41

Additional Assays

		% Fe	% Insol	% S
Unit Cell Conct.	4.12	14.10	10.8	22.80
Cl. Flot. Conct.	3.20	18.35	9.48	23.80

23850

				SA	Thio	Z-5	PO
	25.0	67.0	7.4	2.0	0.10	0.10	0.04
Unit Cell Flot.	2.0	39.0	7.4				
Sub "A" Flotation	8.0	23.0	7.4		0.20		
Cleaner Flot.	2.0	10.0	7.4		no reagents.		

The Denver jig tailing was thickened and ground with reagents 7 minutes to approximately 28 mesh for Unit Cell test. The Unit cell tailing was then classified at 65 mesh and the sand reground 18 minutes and total unit cell tailing subjected to regular Denver Sub A flotation. A summary of the total test is shown on page D-5

7.0 for unit cell
65
18

SA = Soda Ash
Thio = Thiocarbanilide
Z-5 = Amyl Xanthate
PO = Yarmor F Pine Oil

Tests 2 A-2B

AN-13388

HEAD ORE CRUSHED MINUS 10 MESH

			ASSAYS oz/ton	%	%	%				
			Ag	Pb	AS	Sb	Fe	Insol	Ag	Pb
	Head Sample Assay		37.0	1.04	1.66	1.20	3.55	65.04		
	Calculated Head Assay	100.0	39.02	1.03	—	—	—	—	100.00	100.00
(1)	Denver Jig Conct.	4.40	251.00	6.08	4.57	10.73	7.85	22.72	28.30	26.04
(2)	Unit Cell Conct.	4.12	425.80	9.73	9.73	17.44	14.10	10.80	44.96	39.03
(3)	Cl. Flot Conct.	3.20	221.40	7.30	15.28	13.80	18.35	9.48	18.16	22.74
(4)	Flot Cleaner Middling	1.92	44.10	2.02					2.17	3.78
(5)	Flotation Tailing	86.36	2.90	0.10					6.41	8.41
(6)	Total Concentrate 1-2 and 3 combined	11.72	30.40	7.7	9.3	13.9	12.9	14.9	91.42	87.81

Additional Assays

			% ZN	%Cu	% S
1	Denver Jig Conct.	4.4	3.24	0.51	11.74
2	Unit Cell Conct.	4.12	6.10	0.83	22.80
3	Cl Flot Conct.	3.20	8.50	0.46	23.80
6	Total Combined Conct.	11.72	5.67	0.62	18.9

Screen Analysis Flotation tailing-mesh	% Wt.	% Wt. cumulative
+48	2.0	2.0
+65	8.5	10.5
+100	19.5	30.0
+150	13.0	43.0
+200	9.5	52.5
-200	47.5	
	100.0	

General Technical Data

13.

The Buena Vista Mining District is fortunate in having good gravel roads into the very heart of the district. The Bear Basin Mining Companies Mill site is located only twenty five hundred feet beyond the end of the Mine to Market Road built during the past year , this millsite is just twenty four miles from North Bend, Washington by excelent gravel, County roads. North Bend is on the main line of the Millwalkee Rail Road and is also served by a spur of the Northern Pacific.

The Bear Basin Mine is located two and one half miles by trail beyond the end of the above mentioned road, the construction of a road or the erection of a tram line to connect the mine and millsite presents no great problems. The Bear Basin Mine is well located in regards to transportation facalities.

General Technical Data

14.

The water supply for all purposes is ample the year round. The main source is on the property and is fed from the overflow of Bear Lake, a glacial tarn located one thousand feet above the floor of the Basin., engineers estimate the flow from this lake and the fall suffecient to furnish a minimum of one hundred fifty horse power the year round. The millsite is located near Bear Creek with ample water for all purposes and suffecient fall to generate a minimum of three hundred horsepower the year round.

General Technical Data

17.

On the property:

One building 14 by 20 feet, used as living quarters and warehouse, in good repair, with ample acconidations for six men.

2,000 feet 1½ in. steel pipe with fittings, suitable for use as air or water lines.

(1) 105 cubic foot per minute air compresser in new condition.

(1) 45 lb. rock drill, with shell for bar mounting in new condition.

(1) 45 lb. rock drill, with shell for bar mounting needs new rotation parts.

(1) 4 ft. pelton water wheel complete with nozzle and valve, servicable condition.

800 ft. 8 in. water pipe, repairable.

Complete set blacksmith tools.

(1) 6 ft. collum with arm.

(1) air receiver, 24X72 in.

(2) air receivers 18X48 in.

(1) mine car 6 cubic foot.

Pipe dies ¼ to 3 in.

Complete set hand tools.

Carpenter tools.

(50) drill steel 18 to 72 in.

(50) detachable drill bits.

(2) grinding wheel mandrels servicable.

(1) small air turbine for grind ing wheel.

(1) hydrolic ram.

50 ft air hose with fittings

5

50 ft water hose with fittings.

General Technical Data

17. continued;

(1) 7 H.P. gasoline hoist double drum, new.

600 ft. 3/8 in. cable, new.

(1) Warsop gasolin powerd rock drill, new.

(1) 1½ H.P. gasoline engine, new.

(4) 1 5/8 in. carbide insert drill bits.

(2) 24 in drill steel, new.

(2) 48 in. drill steel, new.

(2) 12 in. sheives, complete with swivles.and cleves.

Form MF-103
(April 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.
Approval expires 6-30-51.

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

DO NOT FILL IN THIS BLOCK

Docket No. DMA 1379

Date received 5-31-51

Participation

Bear Basin Mining Company

641 N. Callow Ave.
Bremerton Washington

Name and address of applicant

Date 12 May, 1951

FILL IN THIS BLOCK

Date of application

Estimated cost $77,700.00

Mineral or metal Antimony & Manganese

Percentage of Government participation 75%

Location of mine King County, Washington

Sections 13, 14, 23, and 24, Township 25 N., Range 10 E. W. M.

Date of filing MF-100

DMA Docket Number, if available 1379X

INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four signed copies of the application to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive officer thereof, with your name and address on each sheet of the application and all accompanying papers. If any question is inapplicable, or if you cannot answer it, so state on the form. Where the space provided for answer is insufficient, answer on a separate sheet, annex it to the application form, and refer to it in space for answer. If the application is approved, you will be presented with an exploration project contract on Form MF-200, for your signature.

THE APPLICANT

*1. Is applicant an individual, partnership, or corporation?
*2. If a partnership, state names and addresses of partners. parts 1 to 5 answerd on forms MF*100
*3. If a corporation, state names and addresses of officers, directors, and five largest stockholders.
*4. Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who will manage the project.
*5. Are you the owner or the lessee of the property?
6. If owner, state what claims, liens, or encumbrances, if any, are against the property. See attached Schedule
7. If lessee, attach a copy of the lease and state if it is in good standing. does not apply.

NOTE.—It will be necessary to procure and attach to the exploration project contract agreements of claimants, lienors, encumbrances and lessors subordinating their interests in the property to the interest of the Government under the contract.

8. Furnish current financial statement, showing assets and liabilities, and a profit and loss statement. attached
9. How much money is applicant prepared to invest in proposed project? Is it sufficient to pay your part of the cost of the project as detailed in question 23 of this application form, in accordance with the regulations on Government participation (Section 9 of Mineral Order 5)? $23,000 enough for applicants part.

*If you have already answered these questions on MF-100, you are not required to answer the questions for this application.

16—64067-1

THE PROPERTY

10. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.
    (*b*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

    NOTE.—If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*b*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

*11. State the present and former names of the property, if any.
*12. State, in detail, the location of the property with reference to towns, railroads, roads, shipping points, including distances and directions and kinds and conditions of roads.
*13. State source and quantity of water available for operations and its sufficiency at all seasons.
State amount of power to be used, rate per hour or other cost, and source.
*14. Describe any existing useable facilities, equipment, buildings, or structure now on the property that will be devoted to the exploration work.
15. State in detail how the ore could be shipped and how and where milled.
*16. History:
    (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for any past suspensions of operations.
    (*b*) State briefly the known history and production of adjoining and neighboring properties.
    (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.
*17. Production:
    (*a*) If mine is in production, furnish the following information:

	Tons per day	*Grade or analysis*	*Cost per ton*	*Net value per ton*
(1) Mining				
(2) Milling				
(3) Shipped or sold				

*18. Ore or mineral reserves: (If property is or has been operating.)
    (*a*) Describe the ore or mineral deposits briefly.
    (*b*) Submit available maps and assay data.
    (*c*) Give estimated tonnage and grade of each class of ore reserves.
19. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

THE EXPLORATION

20. For what mineral or minerals and for what types of deposits and ores will the exploration be conducted?
21. Describe briefly, but concisely, the proposed work and the estimated time required to complete it.

    NOTE.—The Government will not participate in a project that will require more than 2 years to complete.

22. Furnish statement of the geological basis of the project with particular emphasis on factors leading the operator to expect the finding of commercial ore bodies. This statement should be accompanied by supporting maps such as geological maps, maps of the proposed openings and assay maps, sample lists, and other pertinent data.

THE REQUIREMENTS AND COSTS

23. Tabulate in the form of an itemized statement with a sum for each item the estimated requirements and costs of the project so that the total will give the estimated cost of the project in which the Government will participate, as follows:
    (*a*) Labor, by numbers and classes (miners, muckers, millmen, etc.), with wages of each.
    (*b*) Supervisors, by numbers and positions, with salaries of each.
    (*c*) Cost of necessary repairs to existing facilities, structures, and buildings.
    (*d*) Cost of necessary installation or construction of additional facilities, structures, and buildings.
    (*e*) Cost of items of equipment, not now owned by the applicant which must be purchased for operations at a cost of $50 or more each.
    (*f*) Cost of rental for equipment which the operator proposes to rent.
    (*g*) Rental value of items of equipment which the operator now owns and which will be devoted to the work.
    (*h*) Cost of materials and supplies, including items of equipment costing less than $50 each.
    (*i*) Cost of power, water, utilities, and any other items not provided for above.
24. Furnish a time schedule of the project, stated in terms of months after project is approved, showing progress expected to be accomplished and the money expected to be spent.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

Bear Basin Mining Co — By James B. Crapper
(Name of company) — (Signature of authorized official)

May 28 1951 — President
(Date) — (Title)

Title 18, U. S. Code (Crimes), Section 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.

*Same as footnote on page 1.

16—64067-1 U. S. GOVERNMENT PRINTING OFFICE

Current finantial statement
Baer Basin Mining Co.
Dec. 31, 1950

Assets

Current Assets:		
Cash in Banks and In Hand		$ 12,330.17
Contracts Receivable		11,430.25
Current total Assets		$ 23,760.42
Fixed Assets:		
Mine and equipment		100,000.00
Office Furnature and equipment	$ 224.73	
Less reserve and Depreciation Office Equipment	62.76	161.97
Deferred Organization Expense		30,508.75
Total Assets		$ 154,431.14

Liabilities

Current Liabilities		
Pleges received	$ 4,554.75	
Pleged Contracts	11,430.25	$ 15,985.00
Accured Liabilities		108.10
Mine Contract Payable		27,300.00
Net Worth:		
Capital Stock Authorized	$ 300,000.00	
Less unissued Capital Stock	186,531.00	
Capital Stock Issued		$ 113,469.00
Paid in Surplus		1,260.00
Surplus Net Profit (Loss) Schedual II		(3,690.96
Total Liabilities and Capital		$ 154,431.14

Bear Basin Mining Company

Profit and loss statement

For the year ending December 31, 1950

Income	$ None
Expenses:	
Mine Expense	$ 629.45
Labor	782.50
Commissions	669.00
Miscellaneous	33.22
Payroll tax	92.25
Depreciation	22.48
Legal&Auditing	445.00
Office supplies	50.32
Remt	422.60
Travel expense	239.85
Advertising	257.82
Maps & Blueprints	19.05
Telephone and Telegraph	17.96
Liscense, Bond Ect.	10.00
Total loss Carried on Balence Sheet (Schedule I)	$ 3,690.96

The Property

10.

The real propert involved in this proposed development is to be Cody Claim and Tuttle Claim, two of the twenty five claims held by the Bear Basin Mining Company, a true metes and bounds description of each of these two claims is attached.

All permanent or semi-permanent equipment will be installed on Cody Claim, A portion of the proposed development will extend through the East End Boundry of Cody Claim into Tuttle Claim. The only exception being that the living quarters are located on Compton Claim, one of the Bear Basin Group and located north of and adjacent to Cody Claim.

DESCRIPTION

For Amended Location Of

CODY CLAIM

From the 1/4 Corner between Sections 14 and 23, T. 25 N., R. 10 E., W.M. run thence S 1° 07' 13" E. for a distance of 594.82 feet to the Northwest Corner of Claim Cody, the True Point of Beginning; thence along the West End Line S. 23° 56' 20" W. for a distance of 304.415 feet to the West End Center; thence S 23° 56' 20" W for a distance of 304.415 feet to the Southwest Corner; thence S 56° 11' 48" E. for a distance of 1500.00 feet to the Southeast Corner; thence N 23° 56' 20" E. for a distance of 304.415 feet to the East End Center; thence N 23° 56' 20" E. for a distance of 304.415 feet to the Northeast Corner; thence N 56° 11' 48" W. for a distance of 1500.00 ft. to the True Point of Beginning.

DESCRIPTION

For Amended Location Of

TUTTLE CLAIM

From the 1/4 Corner between Sections 14 and 23, T. 25 N., R. 10 E., W.M. run thence S 41° 21' 18" E. for a distance of 1903.99 feet to the Northwest Corner of the Claim Tuttle, the True Point of Beginning; thence along the West End Line of the said Claim Tuttle S 23° 56' 20" W. for a distance of 304.415 feet to the West End Center; thence S 23° 56' 20" W. for a distance of 304.415 feet to the Southwest Corner; thence S 44° 17' 20" E. for a distance of 1553.67 feet to the Southeast Corner; thence N 23° 56' 20" E. for a distance of 311.225 feet to the East End Center; thence N 23° 56' 20" E. for a distance of 311.225 feet to the Northeast Corner; thence N 44° 36' 40" W. for a distance of 1550.20 feet to the True Point of Beginning.

The ores from the Bear Basin Mine will be milled in a company owned mill to be built by the Company on the Companies millsite, transportation from the mine to the mill will be either by truck or by aerial tram. The company is at this time negotiateing with the State of Washington, Mine to Market Road Commission for an extention of the existing road to the Bear Basin Property line, this road when built will pass through the millsite, making transportation to and from the mill a simple trucking operation.

Concentrates from the mill will be trucked to North Bend, Washington, over existing Mine to Market and County roads, these roads are of new construction or have been recently rebuilt and are all in good repair. From North Bend the concentrates can be shiped to Tacoma Smelter or the salt water ports of Puget Sound, either by rail or truck or they can be shiped east by rail.

The grade and percent of recovery indicated in the Denver Equipment Company, Ore test report may be missleading, as the ores shiped to Denver for these tests were taken from the dump at No. 3 Tunnel, where they had been exposed to the elements for a considerable period of years, this leads to the beleif that concentrates made from fresh ores will yeald a better percentage of recovery and have a higher ratio of concentration.

The ores found in this proposed development do not show the highest antimony content on the property. On the Dawson Claim at an elevation of 5800 feet, some 1200 feet higher than the adit of the No. 3 Tunnel, antimony ores are found assaying 5.8% sb with stringers assaying as high as 23% sb. These ores are so situated that erosion has hade little or no effect, considerable alteration is evident, the manganese carbonate has altered to wad, oxides of antimony are present, and clusteres of stibinite crystals or buds are found in the stringers. Thin sections of the Dawson ores have identified it as haveing been similar to, and beeing of the same origion as the No. 3 Tunnel ores, tho the outcrop occors 3,000 feet east and 2700 ft north of the No.3 Tunnel.

All the technicaly traind men who have visited and reported on their findings on this property, since 1926, have considered the the development of the No. 3 Tunnel as the key operation to the eventual exploitation of all the veins to the north and east of this tunnel, this includes all the veins known to contain antimony and manganese in quantity.

Maps enclosed with the report give the relative positions of all the out crops and workings mentioned in this report.

While the ores represent a low grade antimony mine there is ample reason to beleive that this mine will compare with the Yellow Pine Mine in Idaho when suffecient development has been done, especialy when ground to the east and north is opened. In addition a considerable quantity of manganese will be made available, also lead , zinc and silver, all metals of industrial importanc.

The Exploration

20.

The Base metals to be explored for are in the order of there importance by percentage, antimony, lead, and zinc with manganese as an important by product.

The identified minerals are, stibinite, jamesonite, freibergite, andorite, rhodochrosite, gelena, and sphalerite.

These minerals occur in fissure veins and are found in substancial quantity where ever intersecting fissures have left openings in the rock.

The Exploration

21.

The first phase of the exploration will be the sinking of a winze on the high-grade ore exposed in the No.3 Tunnel of the Bear Basin Mine, to a depth suffecient to allow drifting on the vein at a depth one hundred feet lower than the present adit.

The second phase will be, drifting along the vein both , east and west, one hundred fifty feet in each direction.

The third phase is to be the exploration of the vein at a depth four hundred feet lower than the present adit by opening a new adit four hundred feet lower and one thousand feet distant from the present workings. This will require about one hundred feet of crosscut to the vein and one thousand feet of drift along the vein to a point directly below the end of the west drift in the upper workings.

The fourth phase will be the driveing of a raise to connect the upper and lower works.

The estimated time required for the above work is, fourteen months for the actual under ground pperation plus one month for preperation.

The attached sketch shows the proposed sizes and extent of the development.

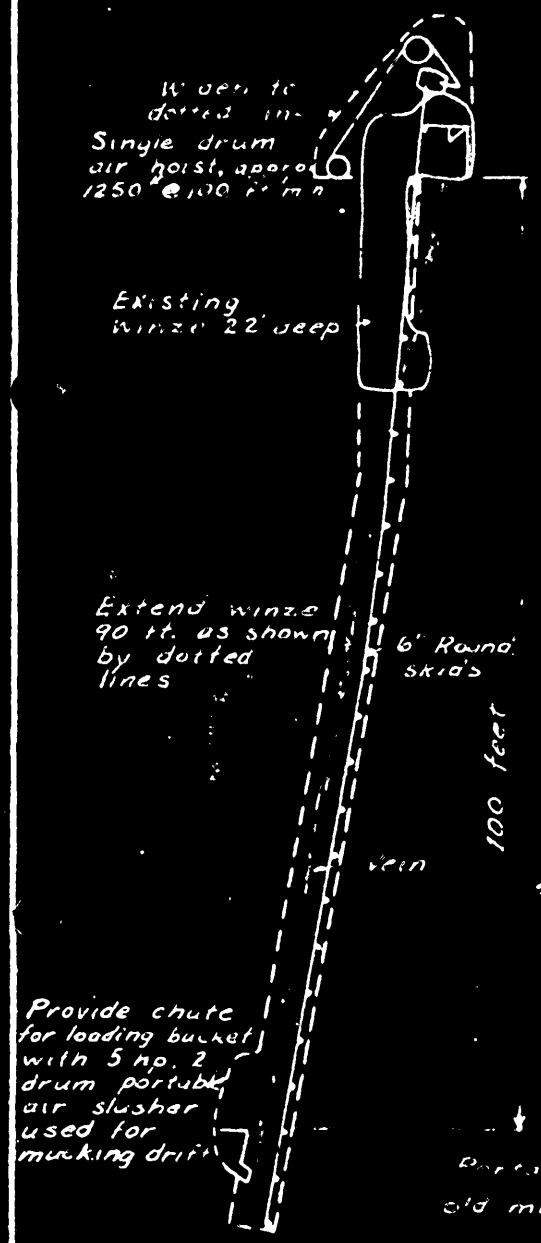
DEVELOPMENT DETAILS
BEAR BASIN MINING CO.

Scale: As shown

Date: August 1942

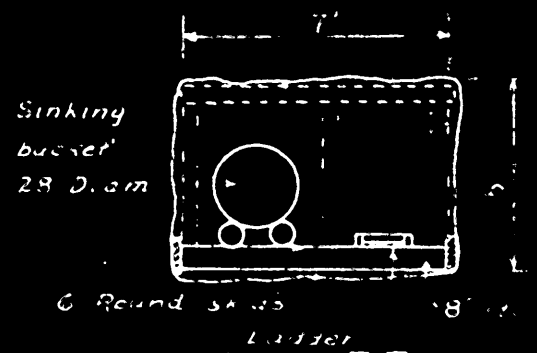
By H. L. Bernel

Scale 1" = 20'

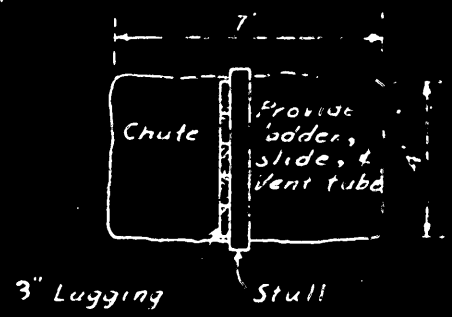


WINZE

Timber shown dotted probably will not be replaced

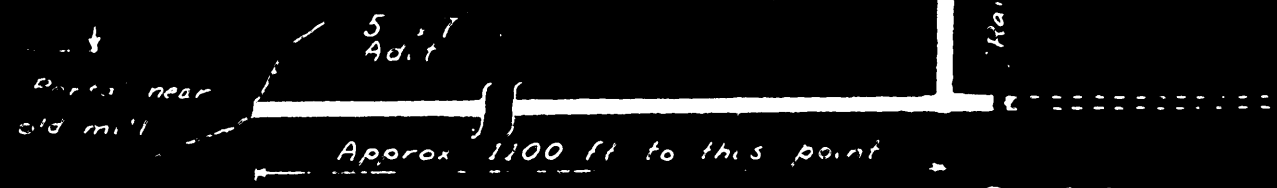


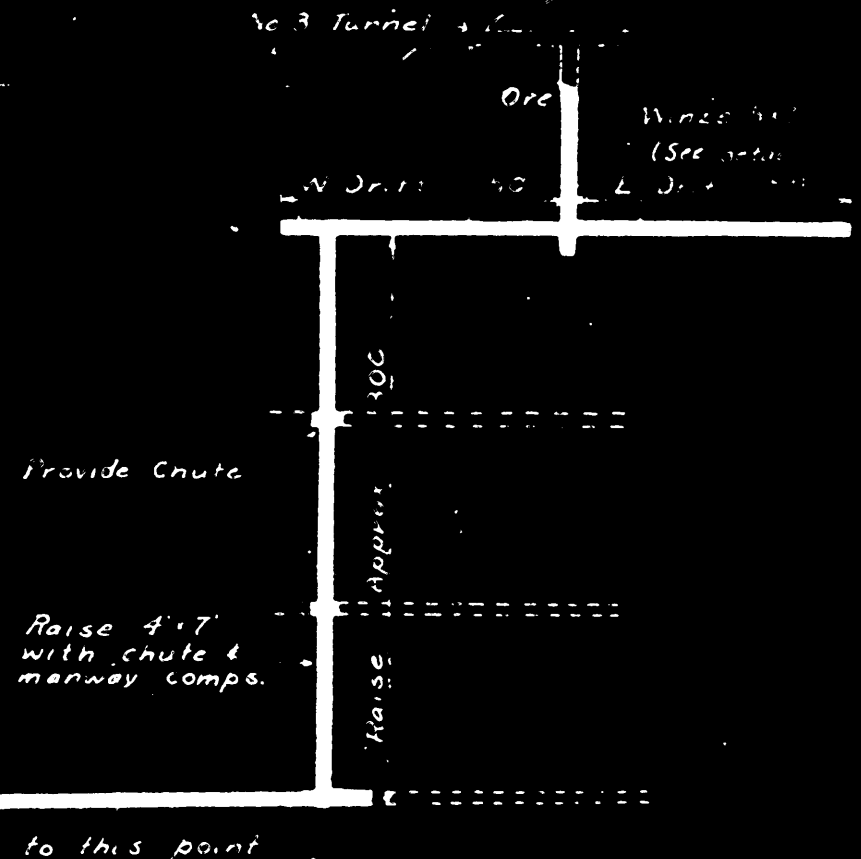
WINZE



RAISE

Scale 1" = 5'





LONGITUDINAL SECT

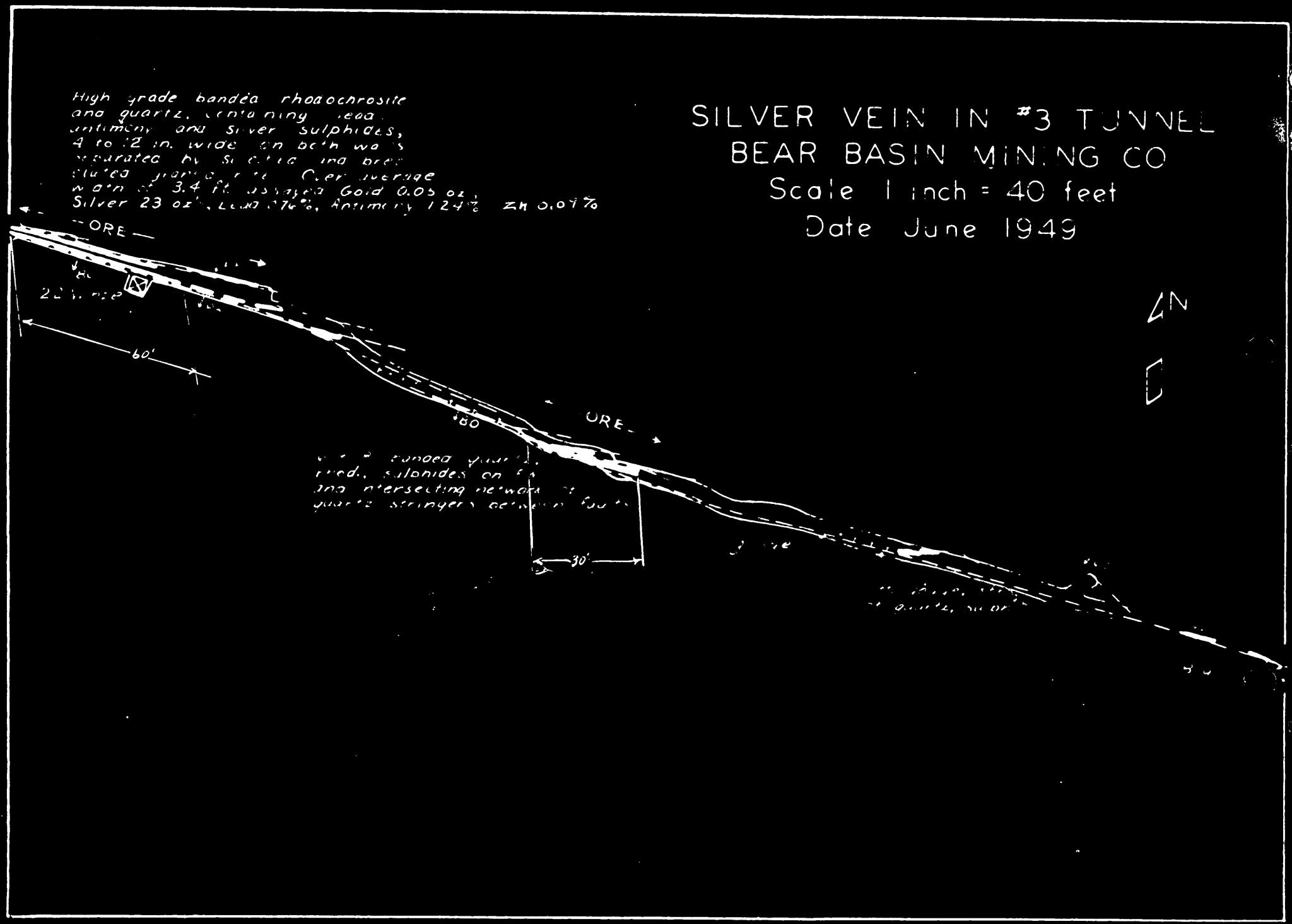
The Exploration

22.

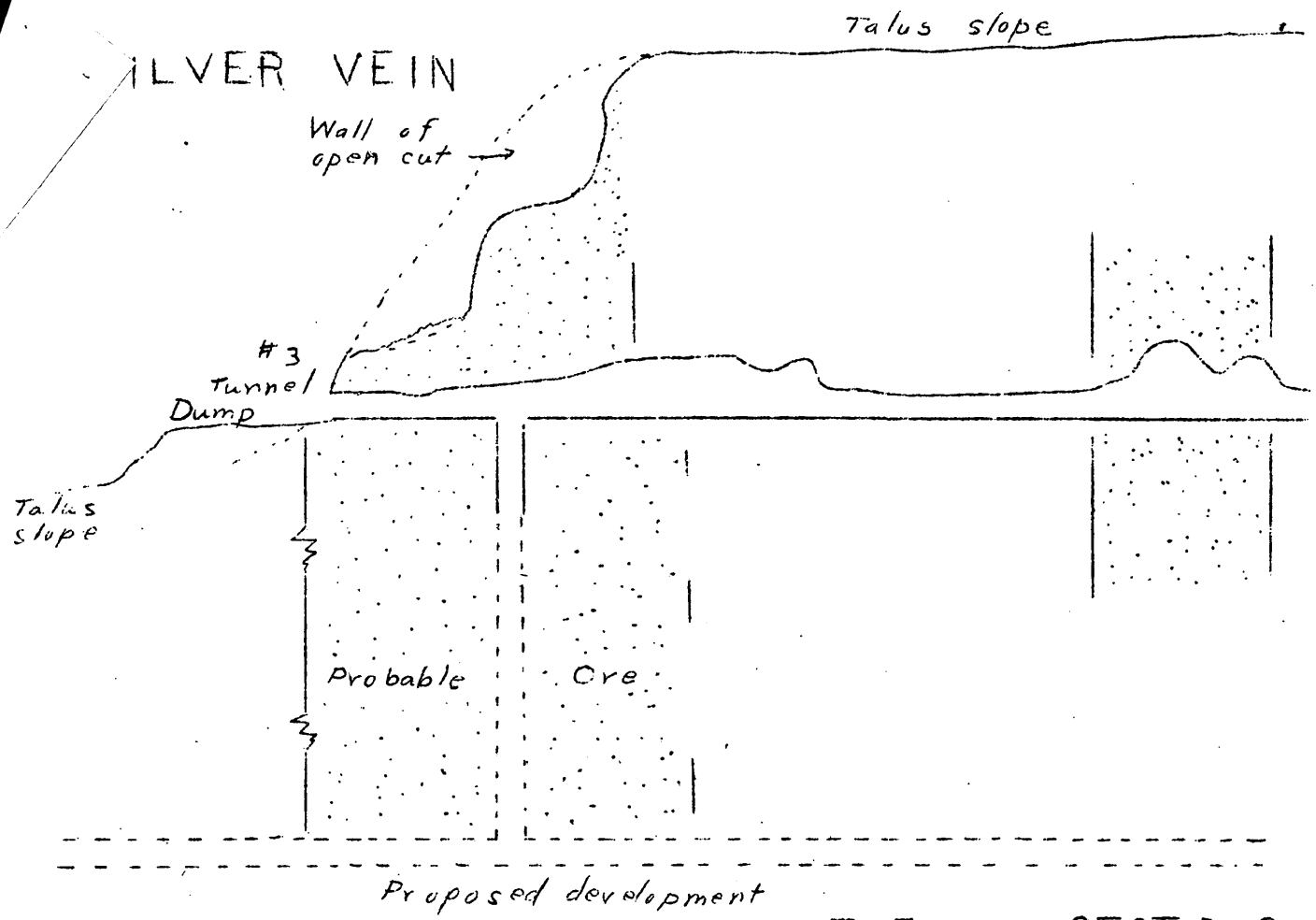
There is on the Bear Basin Mining property a system of mineralized fissures of unusal length, these fissures strike roughly in an east west direction, in addition a second set of mineralized fissuers intersectsthe first at oblique angles. Both sets of fissures show, where ever exposed, evidence of hydro- thermal alteration and mineralization. In all places that the intersections of these fisurers have been exposed mineralization has been intense and ores in commercial quantiy and grade are found. This system of veins is recognized by geologists as extending through the Bear Basin Mine across the devide to the east and on down into the Miller River valley where the Cleopatra and Aces Up Mines are located. This gives a indicated length of over ten thousand feet for the system if not for any individual vein. The dip of the veins in this system ranges from ninty degrees to seventy degrees, some idea of the depth that can be expected can be had from the folowing, commercial ores are found in the No. 3 tunnel of the Bear Basin Mine at an elevation of 4600 ft. again at the top of the devide at an elevation of 5800 ft, again in the Cleopatra Mine at an elevation of 3850 ft. and still lower in the Aces Up mine at an elevation of 2200 ft. this gives a total known vertical depth of 2500 ft. The ores are similar in all three mines, being made up of jamesonite, stibnite with silver and lesser amounts of other sulphides. The only notable difference in the two ores is the carbonate gangue common to the west parts of this vein system but not found in the east.

In the No. 3 tunnel of the Bear Basin Mine there are exposed three mineralized fissures of different strikes and angles of dip, at both points of intersection, high-grade ores are present, the first has made ore from the portal to a point sixty feet inside to the east, the distance from the portal west can not be determined as the vein dissapears under the talas at this point. The second fissure crosses at a greater angle comming in at about 150 ft from the portal and making about thirty feet of ore. The third fisure is the one the drift was driven on. Computation based on the different angles of strike and dip of the veins indicate they will meet at a depth of about one hundred feet below the present level, if this is proven, an ore body of considerable extent is expected, the proposed development is deseignd to explore this possibility and also determine the west boundry of the known ores.

A partial analysis of the ore found in No. 3 tunnel is included in the Milling report, the manganese indicated in the ore description amounts to 10 to 15 % of the sample.

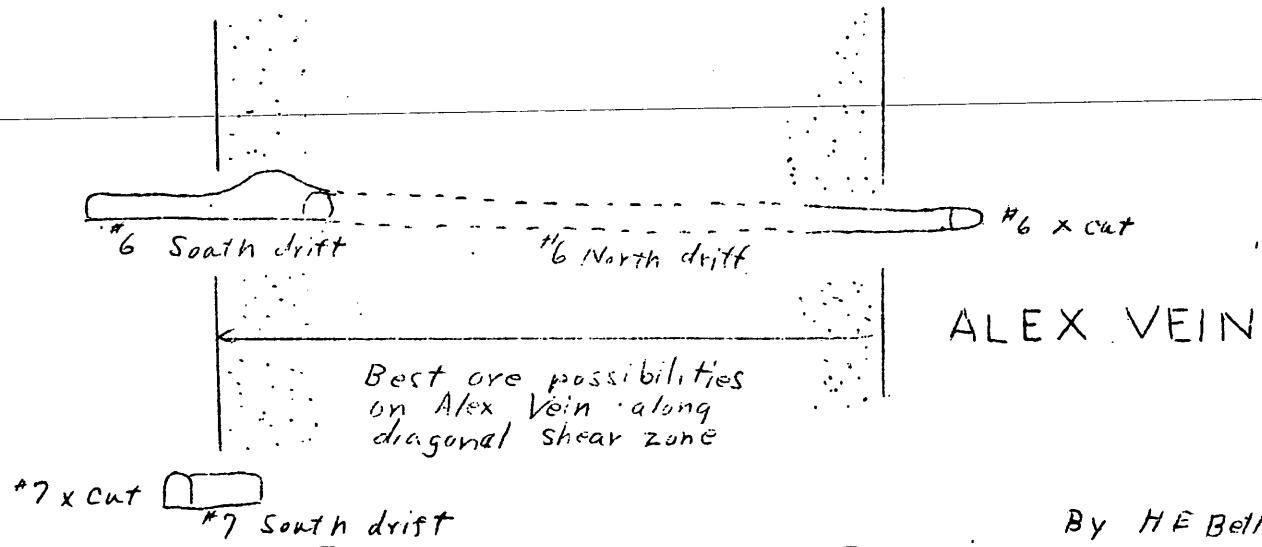


SILVER VEIN IN #3 TUNNEL
BEAR BASIN MINING CO
Scale 1 inch = 40 feet
Date June 1949



LONGITUDINAL SECTIONS

Approximate ground level Scale: 1 inch = 40 feet



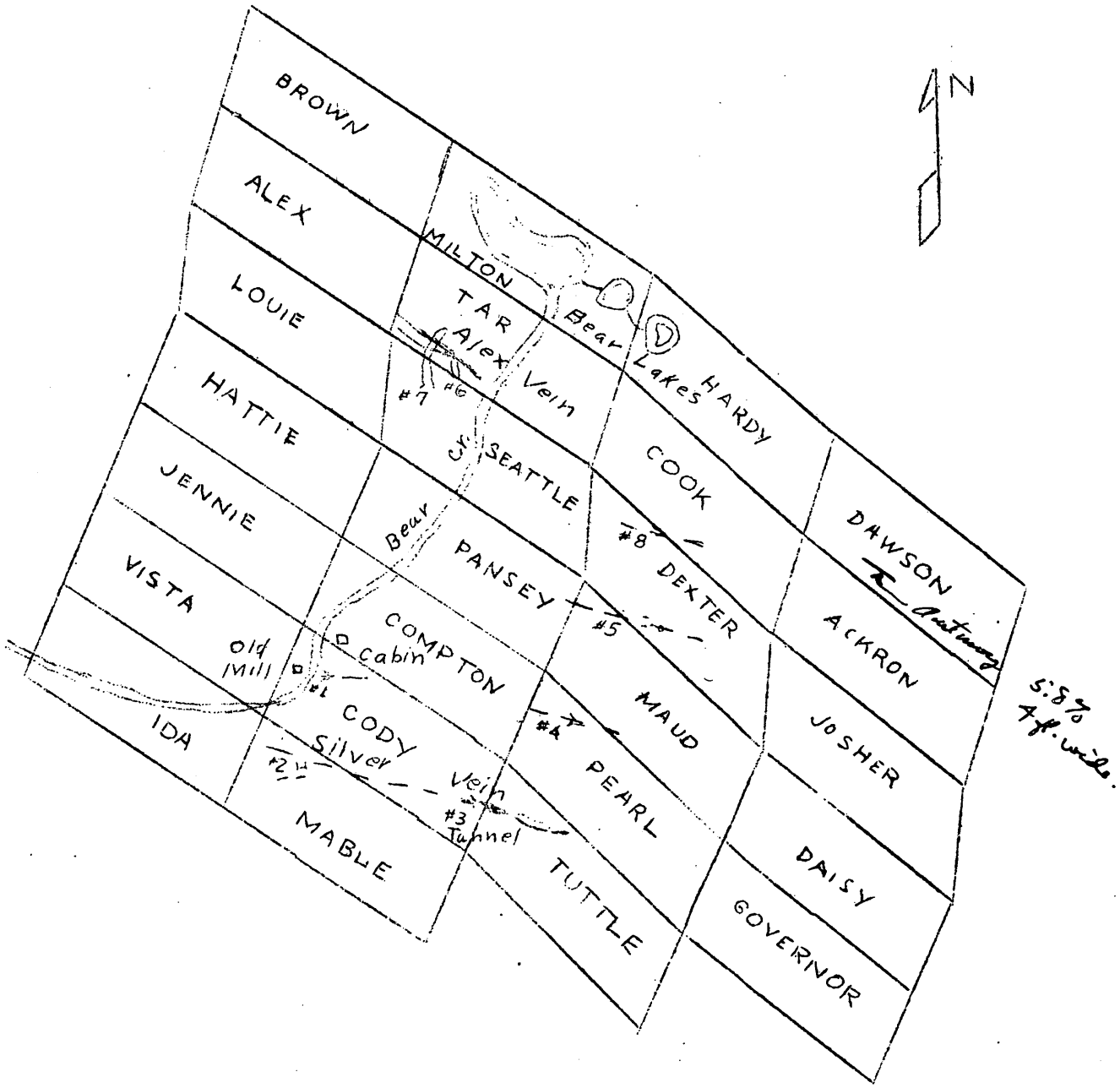
By H E Bethel

LOCATION OF PROSPECT TUNNELS ON VEINS OF BEAR BASIN MINING CO

Scale: 1 inch = 1000 feet

Date: June 1949

Note
Bearings of tunnels 4, 5, & 8 approximate



Requirements and costs

23.

The attached report gives the estimate costs includeing supplies and equipment to be purchased. This report was made for this Company by Mr. H.L. Bethel. Regesterd Mining Engineer of Seattle Washington. August 1949. The increased costs since that time will be offset by the improved transportation facilities and articals of equipment purchased by the company since that time.

The only equipment that may be needed in addition to that indicated in Mr. Bethels report will be a larger air compresser, this item may be purchased in Seattle, used but in good condition, for $3,000.00

The power costs are included in Mr. Bethels report under the item"compressed air"

The Company does not propose to rent any equipment.

The rental value of the companies equipment will be $450.00 monthly.

No repairs are necessary on the existing building. it will be necessary to construst one powder amgazine, useing materials already on the premisses cost $260.00 and one blacksmith shop, from materials on the premisses $390.00

Over and above Mr. Bethels estimates.

Air compresser	$3000.00
Powder Magazine	260.00
Blacksmith shop	390.00
Total	$3650.00

Mr. Bethels estimates	$74,050.00
Total for Exploration	$77,700.00

ESTIMATE OF DEVELOPMENT AND STOPING COSTS

BEAR BASIN MINING CO.

By H. L. Bethel, Mining Engineer

August 17, 1949

ESTIMATE OF DEVELOPMENT AND STOPING COSTS

BEAR BASIN MINING CO.

Winze and Drifts from Winze:

No final program for exploitation of the Silver vein of the Bear Basin Mining Co., can be made until sufficient exploratory development work has been done to adequately determine the size and value of the ore shoots. It was with this in mind that the writer recommended in a preliminary report the extension of the existing winze to a point 100 feet below the No. 3 tunnel level, followed by drifting along this level to determine the distance the ore extends to the west under the talus slope beyond the portal of the No. 3 tunnel, and the trend of the ore shoots with depth.

An estimate of the cost of doing the above work has been prepared under the assumption that while this work is proceeding it would be almost the only activity at the mine, and thus would have to assume certain surface expenses not directly connected with the actual mining activity. The cost may be summarized as follows: (Details in Appendix I.)

1. Preparing to sink, including purchase of an air hoist, slusher, pneumatic sump pump, rail, mine car, pipe, hose, sinking bucket, etc. (most used) (Air compressor excluded).	$ 2100.00
2. Sinking a 5 x 7 winze 90 feet at a cost per foot of $48.77 direct cost plus $10.67 surface expense or 90 x $59.44 =	5350.00
3. Driving a 5 x 7 drift 150 feet east and 150 feet west from bottom of winze at a cost per foot of $35.48 direct plus $8.54 surface expense or 300 x $44.00 =	13200.00
Total for winze and drifts.	$20650.00

To obtain these development costs will require the utmost in economy of labor, and the following specific recommendations are made and were assumed in making the cost estimate:

1. The size and plan of development units be as shown on the accompanying drawing.
2. The recently developed tungsten carbide bits be used with a resulting increased drilling speed insuring the completion of a round in one shift of drilling.
3. The use of 60% gelatin explosive.
4. The drifts be driven from the winze without track using a small portable 2 drum air hoist and scraper to muck directly into the bucket at the winze, and that the two drifts be worked in conjunction so mucking and drilling can proceed with a minium of interruptions.

A MILL Level Adit:

The driving of a mill level adit provides a good way to obtain additional depth on the vein and to provide a means of transportation of the ore to the mill and men and supplies to the mine but it is an item of considerable capital expenditure, so the knowledge gained in doing the preceding development work will certainly influence the Company's course in this undertaking. A portal near tunnel No. 1, above the old mill site, would mean the adit would be driven mainly as a crosscut to intersect the vein somewhere below the ore shoot in the No. 3 tunnel. However there are some surface values along the strike of the Silver vein about 1000 feet west of the No. 3 tunnel, do there is an alternate possibility of locating the portal on the south bank of Bear Creek, if a site could be found, and crosscutting a shorter distance to teh vein which could then be drifted on to the east so that the adit would serve to prospect the western part of the vein as well as providing access to the eastern ore shoot. This latter choice would probably involve a longer tunnel plus some

outside bridge building to reach the mill, which may be partly offset by easier drilling and blasting along the vein than in the unaltered granitic rocks.

The writer merely brings these alternates to mind and has prepared a cost estimate based on a distance of 1100 feet from the portal to a point where a raise could be put up to the drift driven west from the bottom of the winze. This corresponds to approximately a straight line from a point near the old mill site.

The estimated cost of driving this adit is based on a two shift operation, drilling and blasting on one shift and mucking and tramming on a second shift. Details are given in Appendix II. The estimated cost per foot of advance is $31.29 direct plus $8.54 surface expense, or a total of $39.83 per foor.

The total cost of the 1100 foot adit would thus be 1100 X $39.83 or $43,800.00

Raise:

In order to start mining the ore developed by the winze it would be necessary to connect the end of the mill level adit to the upper development by means of approximately a 300 foot raise. As shown on the accompanying drawing this has been recommended as a 4' x 7' raise, separated into one chute compartment and a ladder and slide compartment by stulls and lagging. This small size has been designated to save capital, and means that ore and waste can not be moved at the same time.

The cost estimate is based on the assumption that the miners will complete a round two out of every three shifts, timbering on the third shift, on a two shift per day basib.

The cost per foot of advance is istimated to be $26.10 direct plus $6.00 surface expense or $32.00, giving a total cost of 300 X $32.00 = $9,600.00

Stoping Costs:

The stoping cost will largely be determined by the mining method selected, and this will in turn be determined by the ultimate size, shape and value of the ore shoots as determined by the development work outlined.

However, we can make a preliminary estimate based on the exposures in the No. 3 tunnel and with the following assumptions:

1. The average mining width will be about 3 feet.
2. There will be some selective mining in the stopes and some pillars of waste will be left.
3. All the ore will be removed, starting the drifts immediately above the drifts.
4. Small slushers or other labor saving devices will be used if the size of stopes warrant it.
5. The costs of the level development not in ore are not included in these stoping costs.
6. The consumption of explosives will be approximately 3 lbs. per ton of ore mined.

On the basis of the above assumptions we can arrive at a figure of approximately $8.50 per ton as the stoping cost.

Summary:

An estimate of the cost of developing the Silver vein by means of a winze from the No. 3 tunnel, drifts from this winze at a level 100 feet below the No. 3 tunnel, a 1100 feet long 5 x 7 mill level adit, and a 300 feet connecting raise as shown on the accompanying drawing may be summarized as follows:

Development	Length feet	Cost per foot	Total cost
1. Winze (5 x 7)			
Preparing to sink			$ 2,100.00
Sinking	90	$59.44	5,350.00
2. Drifts from winze (5 x 7)	300	44.00	13,200.00
3. Mill level adit (5 x 7)	1100	39.83	43,800.00
4. Raise (4 x 7)	300	32.00	9,600.00
5. Stopting		Cost per ton $ 8.50	

(Cost of air compressor not included. About 200 c.f.m. capacity should be provided.)

DETAILS OF COST ESTIMATE -- WINZE AND DRIFTS FROM WINZE

Size of winze: 5 ft. by 7 ft.
Average advance: 3 ft. per day of 2 shifts
Sinking crew: Foreman, 2 miners, 2 muckers, 1 outside man divided between 2 shifts.

Cost per foot of winze:	
Drilling, blasting supervision	$ 16.00
Mucking, hoisting	12.00
Compressed air	4.84
Explosives at 18 lb. per foot of winze	4.55
Detonators	1.00
Steel and bits	1.67
Other supplies	2.35
	42.41
Contingencies and overhead at 15%	6.36
Total direct cost	$48.77
Surface expense including cook, purchasing and transportation, camp maintenance, etc. at $32.00 per day.	10.67
Total caot per foor of winze	$59.44

Cost of Preparing to Sink:	
Widening No. 3 tunnel at top of winze	100.00
Sinking bucket	100.00
Air hoist (new)	450.00
Slusher (used)	450.00
Wire rope (new)	42.75
12# rail, (used)	51.25
Mine car (used)	90.00
Pipe (used)	200.00
Drilling water storage	100.00
Freight and installation of hoist and pipe	268.00
Pneumatic sump pump (used)	200.00
Hose (used)	40.00
Total	$ 2092.00

Size of drift at bottom of winze: 5 ft. x 7 ft.
Average advance: 3.75 feet per day of 2 shifts.
Crew: Foreman and miner on one shift; slusher operator, hoistman, outside man on other shift.

Appendix I cont'd

Cost per foot of drift at bottom of winze:	
Drilling, blasting, supervision	$ 8.53
Mucking, hoisting, etc.	9.60
Compressed air	3.88
Explosives at 15 lb. per foot	3.79
Detonators	.92
Steel and bits	1.78
Others supplies	2.35
	30.85
Contingencies and overhead at 15%	4.63
Total direct cost	35.48
Surface expense at $32.00 per day	8.54
Total cost per foot of drift	$44.02

Appendix II

DETAILS OF COST ESTIMATE -- MILL LEVEL ADIT AND RAISE

Size of mill level adit: 5 ft. by 7 ft.
Average advance: 3.75 feet per day of 2 shifts
Drifting crew: Foreman and miner on shift; 2 muckers other shift.

Cost per foot of drift or crosscut:	
Drilling, blasting, supervision	$ 8.53
Mucking, tramming	6.40
Explosives at 15 lb. per foot of drift	3.79
Detonators	.92
Rail	1.00
Ventilation	.50
Other supplies	2.35
	27.21
Contingencies and overhead at 15%	4.08
Total direct cost	31.29
Surface expense at $32.00 per day	8.54
Total cost per foot of adit	39.83

Size of raise: 4 ft. x 7 ft.
Average advance: 5.33 feet per day of 2 shifts on the basis of 4 feet advance per round with the miners completing a round two out of every three shifts, timbering on the third shift.
Raise crew: Two miners per shift, including foreman.

Cost per foot of raise:	
Drilling, blasting, and tramming	12.00
Compressed air	2.12
Explosives at 13 lb. per foot	3.29
Detonators	.73
Timber and other supplies	2.60
Steel and bits	1.45
Ventilation	.50
	22.69
Contingencies and overhead 15%	3.41
Total direct cost	26.10
Surface expense at 32.00 per day	6.00
Total cost per foot of raise	$ 32.10

Requirements and Costs

24.	Time	Cost
Building powder Magazine and prepearing to sink.	1 mo.	$ 2,750.00
Sinking winze.	3 mo.	5,350.00
Drifting from bottom of winze.	1 mo.	13,200.00
Low adit 1100 ft.	8 mo.	43,800.00
Raise to connect with upper workings.	2 mo.	9,600.00
Total time	15 months.	
Total cost		$74,700.00