October 16, 1952

Mr. W. C. Broadgate
421 Tower Building
Washington 5, D. C.

Dear Mr. Broadgate:

I am returning to you the evaluation of a 20-ton sorting-belt test made on rock from the Willow Creek Mine by the Beryllium Mining Co., Inc.

Please note that the items in the third paragraph of page two are improperly calculated. The item 110 tons should be 11 tons and the $37,500 should be $4,952.20.

I suggest you return the evaluation to them for re-examination. It is possible they are being mislead by their own incorrect estimates.

Sincerely,

Enclosure

DMSA-2561

W. C. BROADGATE

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 14 1952

Dear Mr. Robertson -

The enclosed data may help to show the potential merit of this case from the economic angle.

I think, in general, there has not been sufficient work done on our pegmatite deposits and they should be more extensively explored.

Sincerely

Bill Broadgate

DmEa-2581

BERYLLIUM MINING CO., INC.
920 Second Avenue - Main 2310
Seattle 4, Wash.

Mine at Ohio City,
Colorado

Mica Screening Production
and
incidental Recovery of Beryl

******

Sorting-Balt Test - December, 1949

Material: Waste-rock from mine-face after cobbing of Beryl, Columbite-Tantalite,and other valuable minerals that could be seen. Recovery controlled by the size of visible pieces - seldom under 3/4" in diameter or length.

Tonnage: Approximately 20 tons - passed over a rubber belt, 18" wide on rollers. Picking done by hand, by two women. Very low temperature at the time, seriously affected their efficiency. Rusult as follows:

Scrap-mica,	5,600 lbs.	----14.0%	of total weight
Feldspar	4,200 "	----10.5% "	" "
Beryl	88 "	---- 0.22% "	" "

Values: The market for Feldspar, being uncertain at the time, it was stock-piled. On the other hand, scrap-mica, being in great deman, easily sold for $25 per short ton, delivered at Pueblo, Colo. (Approximately, $20 fob mine.

Possible Revenue: The total amount of waste-rock in dumps is estimated to be between 5,000 and 8,000 tons, accumulated over a period of three years. At the lower figure, and assuming that the above percentage based on hand-sorting is not increased, the probable recovery of mica should be:

5,000 x .14 - 700 tons @ $20. --- $14,000.

Additional Capacity: The percentage of mica recovery will be substantially increased by screening. A screening plant was installed, consisting of jaw-crusher, 3 sets of rolls, and intervening screens, whereby it was found that particles of scrap mica, down to 1/8th-inch could be saved. Whic, of course, would mean some greater tonnage than that secured by hand-sorting on the belt. The present capacity of the plant is

rated at 25 tons per 8-hour day; improvements to be added in 1953, will easily double that. At any rate, it should be possible to process the minimum calculated amount of waste-rock, viz. 5,000 tons within an average working year of 250 days.

Simultaneously, of course, more waste-rock would be moved to the dumps while the mining of the Beryl-coning rock goes on.

Mica Screening Production - 2 - Incidental Recovery of Beryl

The percentage of Beryl recovered by hand-sorting on the belt, was accurately determined. However, it is not known whether the same percentage might persist, but it might increase to the extent that smaller particles which escaped the sorting, will be caught in the processing of the waste-rock through the screening plant.

A spectographic analysis of the ground tailings from the mica-screening plant, still showed a trace of Beryl that may be recovered in a machine such as the Electronic Beryl Picker tested at the Massachusetts Institute of Technology. This test proved that Beryl particles down to one gram could be recovered at the rate of five per second.

At any rate, it might be allowable to assume that, at least 0.22% of the waste-rock dump, may be Beryl - which should produce the following recovery:

5,000 tons @ 0.22% - 110 tons, or

220,000 lbs. @ 22.51¢ ----------$37,500

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Furthermore, it may be taken for granted that some production of Beryl in easily visible crystals and much larger, will take place while the processing of the dump material goes on. Likewise, in so far as concentrations of Columbite-Tantalite may be discovered in the light of past experience, there will be a production of that high-priced mineral.

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DMEA-2581

These test-results passed on to Robertson by Mr. W. C. Broadgate

BERYLLIUM MINING CO., INC.

920 Second Avenue • MAin 2310

SEATTLE 4, WASH.

Mine at Ohio City, Colorado

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 21 1952

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600

SEP 29 1952

Mr. J. R. Wemlinger
President, Beryllium Mining Co., Inc.
920 - 2nd Avenue
Seattle 4, Washington

Subject: Docket No. DMEA-2581
Beryl, Mica, Columbium
Tantalum
New Anniversary-Rocky Pegmatite
Willow Creek Mine
Gunnison County, Colorado

Dear Mr. Wemlinger:

Your application for exploration project assistance, Docket No. DMEA-2581, has been carefully considered by this office.

We find that the proposed project does not warrant our participation in it and we regret to inform you that the application for exploration assistance in this case is denied.

Your interest in the Defense Production Program for strategic minerals is much appreciated.

Sincerely yours,

(signed) FRANK E. JOHNSON

ACTING Administrator

JTRobertson:gaf 9/24/52

Copy to: Admin. Reading File
Operating Committee (2)
Field Team, Region IV
Docket File
Mr. Norton, G-232 GSA Bldg.
Mr. Kauffman, 1347
Mr. Houk

September 24, 1952

Memorandum

To: Chairman, Operating Committee

From: Nonmetallic Minerals Division

Subject: Docket No. DMEA-2581
Beryl, Mica, Columbium-Tantalum
New Anniversary-Bucky Pegmatite
Willow Creek Mine, Beryllium Mining Co., Inc.
Gunnison County, Colorado

Re: A recommendation of denial of application for exploration assistance.

Attached herewith is the Field Team Report in which a very comprehensive review is made of the subject application for exploration - a diamond drilling program.

The Quartz Creek pegmatite district in Gunnison County, Colorado, covers about 29 square miles and contains many pegmatite dikes, 1,800 or more have been noted. One such pegmatite worked in the past by the applicant is known as the New Anniversary - Bucky Pegmatite and as shown in the attached Fig. I of Field Team Report, it is irregular in outline, but roughly 4,000 feet long, 2,500 feet wide. It is within this area that the applicant proposes to explore by drilling.

Beryl is found in sporatic areas of quartz or quartz core segments the largest of which is found on the Bucky Claim and is 100 feet long and 75 feet wide and 40 feet thick; many core segments are much smaller.

Beryl, with sometimes columbite and tantalite, occurs as sporadic clusters in the quartz core contacts.

Investigations by both the Bureau and the Survey plus the mine operation's development have pretty well brought to light the mineralogical characteristics and the overall pattern of ore occurrence. Also numerous vertical cliff-like rock exposures have exposed the formations. The entire study seems to indicate that the ore possibilities are as much proven now as

they ever can be and that additional drilling as proposed would not change the picture. In this regard the information provided on page 4 of Russell R. McLellan's Memorandum Report seems pertinent and confirms the futility of additional drill on any reasonable scale.

The memoranda of Mr. Weis and Mr. Kauffman, Jr., are attached and both specialists concur in the recommendation for denial.

The Nonmetallic Minerals Division, DMEA also concurs in a denial of this application.

Jasper T. Robertson
Nonmetallic Minerals Division

Attachments 3

JTRobertson:gad 9/24/52

Copy to: Admin. Reading File
Docket File
Mr. Houk

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

September 18, 1952

Memorandum

To: L. G. Houk, Chief
Nonmetallics Division, DMEA

From: A. J. Kauffman, Jr.
Rare and Precious Metals Branch

Subject: DMEA Docket 2531, Beryllium Mining Co., Inc., Gunnison County, Colorado.

This office concurs with the recommendation of the field team, that the application be denied.

Signed

A. J. Kauffman, Jr.

Attachments

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
SEP 18 1952

IN REPLY REFER TO:

G-MD-CNM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

September 11, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
SEP 11 1952

Memorandum

REVIEW OF FIELD TEAM REPORT ON APPLICATION DMEA-2581 (Beryl, mica, columbite-tantalite)

To: L. G. Houk, Defense Minerals Exploration Administration
From: P. L. Weis, U. S. Geological Survey
Applicant: Beryllium Mining Co., Inc.
Name of property: Willow Creek (Bucky Pegmatite) mine.
Location of property: Gunnison County, Colorado.
Date of field team report: August 25, 1952.
Authorship of field team report: R. R. McLellan and E. N. Harshman.
Field team's recommendation: Denial.
Comments: The field team is to be commended for an unusually thorough and comprehensive investigation and report.
ACTION SUGGESTED:
Follow field team's recommendation.

Paul L. Weis

Weis:jeh
G-9/11/52
cc: Director's reading file 4212 USGS
Branch " " "
DMEA
Norton's files G-228 "
Weis G-230 "

600

JUN 2 6 1952

Beryllium Mining Co., Inc.
920 - 2nd Avenue
Seattle 4, Washington

Subject: Docket No. DMEA-2581
Beryl, Mica, Columbite-Tantalite
Willow Creek Mine
Gunnison County, Colorado

Gentlemen:

Your application is being referred to Mr. W. H. King, Executive Officer, DMEA Field Team, Region IV, Bureau of Mines, 224 New Customhouse Building, Denver 2, Colorado, for further information.

Sincerely yours,

C. O. Mitterdorf

Acting Administrator
Defense Minerals Exploration
Administration

JTRobertson:gsd 6/25/52

Copy to: Admin. Reading File
Operating Committee (2)
Field Team, Region IV (2)
Mr. Norton, G-232 GSA Bldg.
Mr. Needleman, 1347
Mr. Houk

600 JUN 2 6 1952

Mr. W. H. King
Executive Officer, DMEA
Field Team, Region IV
Bureau of Mines
224 New Customhouse Bldg.
Denver 2, Colorado

Subject: Docket No. DMEA-2581
Beryl, Mica, Columbite-Tantalite
Willow Creek Mine
Gunnison County, Colorado

Dear Mr. King:

Please find enclosed copies of memoranda from Geological Survey and Bureau of Mines with respect to a field referral for the subject exploration assistance application.

A field team investigation is requested and an examination of the property may be made if deemed necessary.

As pointed out by Mr. Weis and Mr. Norton the program of work is probably larger than is necessary and, as they suggest, there may be places where reserves are as much proven now as they can ever be by added work.

The estimate of costs will require some checking; items such as cinder-block construction would appear to be out of place in an exploration project. The cost of items involving overhaul of broken-down equipment - a non-salvage outlay - should also be scrutinized.

Our primary interest is in the beryl, columbite and tantalite minerals rather than in the scrap mica, feldspar and other non-strategic products. A better knowledge of the outcrops appears important and the first phase of the project might best be confined to bulldozing so as to have a better geological understanding of the area as a whole. The thought being that after surface bulldozing is complete, a geological map could be made and a program of drilling could then be more intelligently planned.

Upon completion of the report, please send it to this office along with your own recommendation and comments.

Sincerely yours,

(signed) FRANK E. JOHNSON

Chairman, Operating Committee
Defense Minerals Exploration
Administration

Approved:

J. H. Hedges

Member, Bureau of Mines

D. M. Lemmon

Member, Geological Survey

Enclosures 2

JTRobertson:gad 6/25/52

Copy to: Admin. Reading File
Operating Committee (2)
Mr. Norton, G-232 GSA Bldg.
Mr. Needleman, 1347
Docket File
Mr. Houk

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. DMEA-2581

Date received 6-12-52

BERYLLIUM MINING CO. INC.
920 - 2nd Avenue
Seattle 4, Washington

Name and address of applicant

Date April 1952

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:
   - ☐ Owner.
   - ☐ Lessee.
   - ☐ Contractor.

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Defense Minerals Administration
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5. Number of years in production _____

   If not in production or operation, estimated date when production will begin _____
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 (a)	Official Title (If officer is also director indicate by "D") (b)	Total of Annual Salary, Commissions, Bonuses, Etc., Received From Applicant and Affiliates During Last Fiscal Year (c)	Estimated Net Worth Outside of Interest in Applicant (d)	Number of Shares Held in Applicant Corporation		Life Insurance Carried for Benefit of Applicant	
				Common (e)	Preferred (f)	Amount (g)	Net Cash Surrender Value After Loans (h)
	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	$	$	$		
Preferred stock	$	$	$		

*Indicate period covered.

10. Production:

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.

12. Ore or Mineral Reserves:

(a) Describe the ore or mineral [illegible]osit briefly. Accompany the application by [illegible] available report on the geology and ore reserves.

(*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:

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.

BERYLLIUM MINING CO. INC.
(Name of company)

By J. R. Wessinger
(Signature of authorized official)

April 1952
(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

Form MF-100 - DEFENSE MINERALS ADMINISTRATION - GENERAL
Supplement TECHNICAL DATA

BERYLLIUM MINING CO. INC., 920 - 2nd Avenue, Seattle 4, Washington.

1. Materials produced:

   (a) Chief products are Beryl, Columbite-Tantalite, and scrap Mica.
   (b) By-products: Feldspar, Graphic Granite, Cement aggregates, miscellaneous Rare Earths, and Gold.

2. Name and type of mine, and mill: The property is known as the Willow Creek Mine - the presently used name. It is located on the so-called New Anniversary Pegmatite Dike. It consists of three large open cuts on the Bucky claim (See Exhibits "A" and "B", and reprint of article in Engineering & Mining Journal, herewith) from which the major portion of past mineral production was recovered. Also several small cuts on the South Slope Nos. 1 and 2 claims, from which small amounts of the chief minerals were recovered, and scattered exploration cuts on the three other claims. The mill, which has been chiefly experimental until now, is a dry concentrator type. It consists of a series of crushers, rolls, and successively finer screens for reducing and screening the matrix, while allowing the more flexible mica to pass through the crushers and rolls, and over the tops of the screens, unbroken, to suitable storage bins for shipment to consumers. The fine material passing through the screens, consists of small particles of Beryl, more largely of feldspar and alterations thereof which, according to preliminary tests, contain some recoverable Rare Earths minerals. There is no smelter or refinery on the property. No drilling operations other than such as are needed to open access to the sources of beryl, columbite, tantalite, and associated minerals. Due to the fact that beryl crystals, as well as amorphous columbite-tantalite pieces, are irregularly scattered through the matrix of feldspar, quartz, mica, and other minerals, hand-sorting was the only method thus far used to recover the required minerals. Therefore, too, the formation does not lend itself to a systematic drilling program.

   (a) There are no shafts.
   (b) No drifts or cross-cuts in the mine.
   (c) No tunnels or adits needed.
   (d) There is, approximately, 600 linear feet of open quarry faces.

   Hillside drainage is provided in all open pits, and no flooding or pumping problems are encountered.

   The excavated pits and quarry work, extend over an area, roughly, about 600 ft. long by an average of 200 ft. wide. The productive capacity can only be surmised until considerably more exploration, core-drilling, etc., can be done.

3. (a) The mine is located 9 miles North of Parlin, Colorado, rail shipping point for carload lots, and 21 miles Northeast of Gunnison, Colorado, County seat and rail shipping point for l. c. l. lots.

BERYLLIUM MINING CO. INC., 920 - 2nd Avenue, Seattle 4, Washington.

(b) Gold Brick Mining District.

(c) Township 50 N., Range 3E., N.M.P.M., Section 22.

(d) Gunnison County, State of Colorado

4. (a) The property is not now in operation, due to the unusual severity of the winter, coupled with the lack of sufficiently powerful equipment to overcome the obstacles raised by deep snow drifts and impassable roads on the property. Year around operations can be carried on, with little difficulty if suitable equipment can be made available to keep the cuts and roads free from heavy drifts during the winter, as well as to expedite the search for more ore. The mine was operated during the winters of 1948, 1949, and 1950, with some difficulty but, still, with comparatively short interruptions.

(b) We are operating this property as registered owners, in accordance with a purchase contract of sale from the legal owner, Rodney W. Fields, based on semi-annual payments of $2,500, all of which have been met, to a total of $24,000. Only two more payments remain to be made - one on August 10, 1952, the other on February 10, 1953.

5. The mine has been in production for three years under the control of this Company; approximately one year previously under the legal owner; and, spasmodically under previous prospectors who are reported to have produced some scrap mica tonnage. It is expected that operations, stopped temporarily by severe winter weather, can be resumed in late March or early April, if the roads to the mine and to the pits will have been cleared by then - or earlier if additional suitable equipment can be acquired.

6. Experience of operators:

J. R. Wemlinger; President, Beryllium Mining Co. Inc.
1923-34 - President, J. R. Wemlinger & Co. Inc., New York, N. Y. Engaged in study and exploration of mineral resources of British Columbia and the Yukon, Canada, to be developed by construction of a railroad from Vancouver, B. C. to Fairbanks, Alaska.....1933-36 - President, Montana Mines & Power Co. Inc., Livingston, Montana. Planning reopening of an abandoned mine, near Cooke City, Montana, and development of high-grade copper ore, with gold and silver values. Commercial production proved possible by test shipments. Property closed by Depression.....1936 - Operating tungsten mine, near Alden, Washington. 1937-41 - Resumed exploration work in British Columbia. Mapping mineral resources particularly important alloy metals minerals..... 1941-43 - Adviser to Mr. Frederic A. Delano, Chairman Natural Resources Planning Board, Washington, D.C., in connection with studies covering

mineral resources in British Columbia, Yukon, and Alaska, tributary to the proposed railroad line from Prince George, B.C. and Fairbanks, Alaska. Later surveyed by the U.S. Engineer Corps.....1942-47 - President Canadian-American Railroad & Development Co. Inc., New York, N. Y. Planning financing and construction of above mentioned railroad, including mining exploration, development of industries, colonization, etc. Still under consideration for private financing..... 1948 to date - President, Beryllium Mining Co., Inc., Seattle, Wash.

Aubrey L. Schuler; Vice President, Beryllium Mining Co. Placer and underground mining, 15 years, in Grass Valley and Happy Camp districts, California.

C. A. Wemlinger; Vice-President in Charge of Operations; Assistant to J. R. Wemlinger, since 1936, mining, assaying, sampling, etc., excepting during the years 1942-46, while General Foreman of Inspection Department, Curtiss-Wright Airplane Co., Propeller Division, Caldwell, New Jersey. Located at Gunnison, Colorado since January 5, 1949.

7. History:

(a) This Company was formed in October, 1948, to acquire and develop four claims originally owned by Arthur Pearson and Bert Tucker, respectively of Pitkin and Ohio City, Colorado. These four claims, now recorded as Bucky, Rhona Marie, Pug, and Sally (see Exhibit "A" herewith) were restaked and claimed by Rodney W. Fields of Paonia, Colorado, in 1947 and 1948. This property is located in the so-called New Anniversary Pegmatite, surveyed by the U. S. Geological Survey. The Company also holds a lease on two additional claims - South Slope Nos. 1 and 2, owned by Fred A. Nichols, Evergreen, Colorado.

Complete records of past production from this mine, are not available. But it is generally admitted that the following constitues most, if not all, of its production: Prior to Field's acquisition of the four claims above mentioned, a group mined probably one carload of scrap mica, and then pulled out without doing any further work. Fields mined both the scrap mica and the beryl, and small amounts of columbite and monazite. The exact amount of beryl he shipped is not proved, but it is believed to have been between 10 and 15 tons.

(b) Other than miscellaneous prospect holes, no operations have been carried on, on any of the lands immediately adjoining this Company's claims. The fact that the pegmatite dike on which present operations are going on, is located in the midst of rich gold country, may account for the rather high gold values found in various places and depths, particularly in the albite-quartz and graphic-granite zone in the Bucky

BERYLLIUM MINING CO. INC., 920 - 2nd Avenue, Seattle 4, Washington

claim. A few miles to the North, up Gold Creek, several mines including the Carter Mine, the Raymond Mine, the Gold Links Mine, and the Sandy Hook Mine, have produced very substantial amounts of gold and silver. The Brown Derby Mine, approximately 3 miles South of our mine, had produced beryl, lepidolite, microlite, and feldspar during World War II, and was reopened in 1950. The White Spar Mine of the Consolidated Feldspar Co., 2 miles Southeast of us, has produced high grade feldspar, together with beryl and scrap mica.

(c) No private reports covering this property are available, or known to exist. The U.S.G.S. and the U.S. Bureau of Mines instituted a program of areal mapping, core-drilling, and incidental investigations in 1949 and 1950. But the core-drilling was discontinued after two holes had been put in. Reasons for that discontinuance were not given, though additional holes were scheduled for various parts of the dike, as well as a program of experimental mining methods to be carried on by the Bureau of Mines, to determine the best method of mining the dike. The core-drilling equipment was later removed to the Brown Derby Mine.

8. Names and addresses of Officers, Directors, and the five largest stockholders of the corporation:

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
J. R. Wemlinger 920 - 2nd Avenue Seattle, Wash.	President & D.	None	XX	60,000	XX	None	XX
A. L. Schuler 1302 Queen Anne Ave. Seattle, Wash.	Vice-Pres. & D.	None	$75,000	12,500	XX	None	XX
C. A. Wemlinger Box 276 Gunnison, Colo.	Manager	$4200	XX	25,000	XX	None	XX
P. M. Anderson 2392 Magnolia Blvd. Seattle, Wash.	Sec'y-Treas.	None	XX	500	XX	None	XX
L. V. Houck (Mrs.) 2416 N. 75th St. Seattle, Wash.	Director	None	$52,000	20,000	XX	None	XX
Geo. K. Edwards 1214 East Pine St. Seattle, Wash.	Director	None	$50,000	11,000	XX	None	XX
Jas. E. Sheets 1918 - 3rd Ave. Seattle, Wash.	Director	None	$175,000	32,500	XX	None	XX
	Total	$4200	XXXX	161,500	XX	XXX	XX

BERYLLIUM MINING CO. INC., 920 - 2nd Avenue, Seattle 4, Washington

Five largest stockholders:	(e)	(f)	(g)	(h)
J. R. Wemlinger	60,000			
Jas. E. Sheets	32,500			
Ethel K. Edmunds (Mrs.) 214 No. 46th St. Seattle, Wash.	27,500	XX	None	XX
A. L. Lewis 1022 S. E. Hawthorne Portland, Oregon	25,500	XX	None	XX
C. A. Wemlinger	25,000	XX	None	XX
Total	170,500			

9. Capital Stock Issues

Item	(a)	(b)	(c)	(d)	(e)
Common stock	$100,000.	$87,500.	$0.10	875,000	No Dividends paid as yet.
Preferred stock	None	XXX	XX	XXX	

10. Production:

Item	Kind	1949	1950	1951	Present *
1. Quantity mined (short tons)	beryl	18.5	26.0	3.5	None mined
2. " processed		None	None	None	this year
3. " shipped (short tons)		18.0	26.0	4.0	thus far
1. Quantity mined (pounds)	columbite	1,034	None	620	do.
2. " processed		None	None	None	"
3. " shipped (pounds)		1,000	None	595	"
1. Quantity mined (pounds)	monazite	28	19	14	do.
2. " processed		None	None	None	"
3. " shipped (pounds)		15	None	1	
1. Quantity mined (short tons)	feldspar	73	26	None	do.
2. " processed		None	None	None	"
3. " shipped (short tons)		None	None	None	"
1. Quantity mined (short tons)	scrap mica	97.5	64.2	42.1	do.
2. " processed		None	None	None	"
3. " shipped (short tons)		97.5	60.7	42.0	"

* No work could be done this year as yet, due to weather conditions, as explained in answer to Section 4.

BERYLLIUM MINING CO. INC., 920 - 2nd Avenue, Seattle 4, Washington

11. Any changes in the past monthly rate of production will depend, substantially, on the amount and type of help, granted or loaned, by the U. S. Government through the Defense Minerals Administration or other appointed agency. Additional, more powerful equipment, will enable the company to mine at a much lower cost, thereby making available markets for the by-products that can't be sold profitably under present high mining costs. Simultaneously, that result will, also, substantially increase the production of the more critical and strategic minerals.

12. Ore or Mineral Reserves:

(a) The mineral deposit consists essentially of a granitic pegmatite of pre-Cambrian age, made up of zones having the form of shells and lenses that reflect the shapes of the pegmatite walls. The structure is generally made up of (1) a border zone directly in contact with the quartz mass, usually decomposed granitic material, occasionally containing some beryl crystals; (2) an intermediate zone comprising altered feldspar, or albite, which contains most of the beryl, columbite-tantalite, monazite, mica, and other commercially valuable minerals; and (3) a wall zone consisting almost entirely of potash feldspar (orthoclase), contiguous with the mica schist country rock. This zone too has produced occasional beryl crystals in fairly good sizes up to 10 inches. According to E. N. Cameron, et al., the lateral and downward extension of these zones are to a large extent predictable. (Ref: Internal Structures of Pegmatites, Econ. Geol., Mon. 2, 1949)

The grade of beryl, within these units, has remained essentially constant - averaging 12.6% BeO - and, now, can be predicted with reasonable accuracy.

(b) (1) This type of deposit with its greatly disseminated minerals does not lend itself to the mapping of a standard assay plan, or sections showing size of proved or even probable ore or mineral reserves.

(2) This question can not be answered with any degree of dependability. An estimate of mineral reserves could be made only after a thorough core-drilling program had been carried out. Based on past production from the comparatively shallow pits, plus present indications of ore-bearing material on the surface, it is felt that such a program is warranted; it would determine the strike and depth of the various ore-bearing zones, and thus a fairly dependable measure of proved and probable ore.

It might be justifiable in this connection to adopt some assumptions whereby to guess at a "possible" production: It is known that a total of about 60 tons of beryl was recovered since this mine has been in operation. This was obtained from only two pits, neither of which seems to have been mined out. Judging from present appearances, it seems possible that eight to ten additional pods may be opened up, with production in

approximately the sum ratio of beryl to rock excavation, viz.: 1 ton beryl to 100 tons rock, and thus a recovery of 500 to 750 tons of beryl from the entire deposit does not seem out of reason.

On the same basis, as regards columbite - up to now in the ratio of one ton of columbite to 80 tons of beryl - the possible recovery of columbite should be 6 tons. To which should be added a total of 2,500 to 4,000 tons of recoverable mica. It may be added, here, that the two holes drilled by the Bureau of Mines in the summer of 1950 were not sufficient to give an indication of what ore bodies may exist below, or in other parts of the dike which, roughly, measures 2,500 ft. wide and 4,000 ft. long.

13. Access Roads:

The mine is easily accessible through a good County road from Parlin to Ohio City, which road branches off a paved Arterial Highway, 12 miles northeast of Gunnison, all said locations being in Colorado. Distances to shipping are: From the mine to Parlin the rail loading point for carloads, is 9 miles; for less than carload shipments, the loading point is at Gunnison, 21 miles from the mine. Supplies are usually purchased in Gunnison, or are shipped from Denver to Gunnison, where they are picked up. Denver is 200 miles by road, northeast of the mine. From the upper mine opening, over a rock and dirt road to the campsite, is 0.9 mile, and from the campsite to nearby Ohio City, where most of the miners live, is approx. 2 miles, half of it over Company road; the balance over graded and maintained gravel County road. Additional residence points are available at Parlin, 9 miles from the mine, and at Gunnison, 21 miles from the mine.

14. Water Supply:

Willow Creek runs adjacent to the mine road, through the valley and past the campsite. No water is required in any of the present operations, other than for cooling the internal combustion engines used. The drill crew employed by the U. S. Bureau of Mines, while drilling two core holes on the property, used the water from this creek for their operations. In late summer and fall, the volume of flow falls away to a trickle on the surface; but a shallow pit dug in the creek bed will produce ample water for the mine's operations and for drinking purposes.

15. Power:

No electrical power is used at the mine, as available R.E.A. power, one mile from the campsite, would be insufficient to operate any heavy motors. By the end of 1952, a new high-tension line from Salida, Colorado, should be completed, and thereby ample power for all mining and milling operations would be made available. The rate that will then apply, remains to be determined.

BERYLLIUM MINING CO. INC., 920 - 2nd Avenue, Seattle 4, Washington

16. Labor:

The labor employed by this Company has varied from two to six men; not classified as to muckers, machinemen, millers, etc., but rated as to their capabilities as all-around men who can handle any of the jobs - from sorting the ore to operating the bulldozer. Any of the more hazardous jobs, such as blasting, are handled only by those of the men who are fully experienced in that type of mining.

17. Equipment and Facilities:

Presently available at the mine are:

1 Caterpillar D4 Tractor with Woolridge Bulldozer;
1 Athey Overshot Loader attachment for the Tractor;
1 Ingersoll-Rand Air Compressor, of 125 cfm capacity;
2 Jackhammers, complete, with approx. 150 ft. of air hose;
1 Chevrolet Dump Truck - 2-ton Rated capacity;
1 Converted Dodge Army Truck 4x4, with boom and cable hoist;
1 Mica Concentrating Mill of approx. 50 tons per day capacity;
3 Cabins, 1 Blacksmith Shed, and 1 Powder Magazine.

18. Particular conditions or circumstances affecting our operations:

In Section 7 (b) it was mentioned that the pegmatite in which this property is located, is in the midst of gold rich country. It was actually found that gold ore exists in commercial values within, at least, the Bucky claim.

When the U. S. Bureau of Mines was drilling hole No. 1 (approximate location shown in sketch - Exhibit "C" herewith), two chip samples were taken from the core at the 86'-94.5' section. These assayed 1.29 oz. and 0.32 oz. gold per ton. Other samples taken from the surface and in freshly blasted portions of the dike, showed values of 4.06 oz. gold and 0.66 oz. silver, and 3.20 oz. gold and 0.28 silver. Besides these determinations, 22 samples from the same core hole, were assayed by the Bureau of Mines. Excepting 7 of these, that showed no gold or only a trace, all the others showed from 0.01 to 0.06 oz. gold. Most of these lower values were found in the sludge from the deeper portions of the core-hole.

It is, therefore, reasonable to expect that further development might well expose a new rich field of operations - operations which, indirectly perhaps, could justify mining on a scale that, otherwise, could not be profitable. And it follows that the greater the amount of excavated material, the better also the chances for recovering the critical Beryl and Columbite, that might escape detection in hidden zones. Incidentally, the mining of

that gold ore could well produce some substantial revenue whereby still greater production of the critical minerals could be carried on, independently of exploration such as that provided by government financing.

In the same general area, it was found that there is available an extensive deposit of graphic-granite, adjoining the beryl-columbite-tantalite zone, as indicated in the attached sketch (Exhibit "C"). One geologist who examined the property, estimated that at least one million tons of this mineral could be mined here. Based on a minimum output of 100 tons per day, the corporation could operate this phase of mining the graphic granite, at an estimated cost of $2. per ton. Inquiries were made as to the possible market for this mineral. At least one buyer, the Ferro-Enamel Corp. of Cleveland, Ohio, after having tested a sample, indicated a definite interest in purchasing it at a previously quoted price of $5.00 per ton fob cars Parlin, Colorado (9 miles from the property).

They further advised that they could use at least one carload a day after the present military emergency ceases to curtail their production of enamel frit, used for stoves, refrigerators, etc. Therefore, although this possible development could not be depended upon to provide any immediate revenue, it should produce a considerable return in later years.

Reference has been made herein, to the recovery of gold-silver ore, and that of a large tonnage of the graphic-granite. The object was only to point that out as a means whereby it would be possible to more quickly refund any loan that may be granted by the U.S. Government to the Beryllium Mining Co. Inc. At any rate, for the present, emphasis will be placed entirely on the production of the critical materials.

CONTRACT OF SALE

WHEREAS, ROD FIELDS, of Ohio, Colorado, hereinafter called the Party of the First Part, is the locator and owner of the following described unpatented mining claims, to-wit:

C

> The Rhona, Bucky, Sally and Pug Mining Claims, located in Section Twenty-two (22), Township Fifty (50) North, Range Three (3) East of the N.M.P.M. in the Gold Brick Mining District of Gunnison County, State of Colorado.

O

P

and desires to sell the same; and

WHEREAS, THE BERYLLIUM MINING CO. Inc., a State of Washington Corporation, hereinafter called the Party of the Second Part, desires to purchase the same;

Y

THEREFORE, in consideration of the premises, the mutual promises and agreements herein contained, Thirty thousand ($30,000.00) Dollars in lawful money of the United States to be paid as hereinafter set forth and twenty-five thousand shares of common stock in the Beryllium Mining Co. Inc. to be delivered as hereinafter set forth to the Party of the First Part, the Party of the First Part hereby agrees to sell, assign, convey and quit-claim all of his right, title and interest in and to the said mining claims to the Party of the Second Part, and the Party of the Second Part hereby agrees to purchase the same. The said consideration in the sum of Thirty thousand ($30,000.00) Dollars shall be paid by the Party of the Second Part to the Party of the First Part as follows: $2500.00 heretofore paid, receipt whereof is hereby acknowledged by the Party of the First Part; $2500.00 to be paid with the signing and ensealing hereof, receipt whereof is hereby acknowledged by the Party of the First Part; $4000.00 on or before January 10, 1949; $2500.00 on or before July 10, 1949; $2500.00 on or before January 10, 1950; $2500.00 on or before July 10, 1950; $2500.00 on or before January 10, 1951; $2500.00 on or before July 10, 1951; $2500.00 on or before January 10, 1952; $2500.00 on or before July 10, 1952; $2500.00 on or before January 10, 1953; and $1000.00 on or before July 10, 1953.

The said Twenty-five thousand (25,000) shares of common stock in the Beryllium Mining Co. Inc., a State of Washington Corporation, shall be issued and delivered to the Party of the First Part by the Party of the Second Part between January 1, 1949 and January 15, 1949. It is understood and agreed that said stock has only a nominal value at this time, but that it is hoped that as the mining property is developed and a market found for its products, that it will become valuable. The said stock shall be considered as fully paid and non-assessable.

IT IS MUTUALLY AGREED AND UNDERSTOOD by and between the parties that the Party of the Second Part shall not become in default on any of the payments above set forth for a period of more than thirty (30) days, and should the Party of the Second Part default on any payment above set forth for a period of more than thirty (30) days, then and in that event, this agreement shall be rescinded and shall become null, void and of no effect, and the Parties of the First Part shall be entitled to keep and retain any and all payments theretofore made as liquidated damages, and in addition thereto he shall be entitled to reclaim from the escrow agent hereinafter named a

copy of this contract and the Mining Deed placed in escrow with said agent, as hereinafter provided.

IT IS FURTHER MUTUALLY AGREED AND UNDERSTOOD by and between the parties that the Party of the Second Part shall at all times during the life of this contract keep up and perform all assessment work required by law to be done on said mining claims, or in lieu thereof, as permitted by law, the Party of the Second Part, in apt time, file the affidavits in lieu of annual labor; and should the Party of the Second Part fail to perform said annual labor and file the affidavits therefor, or file the affidavits in lieu of annual labor, as the case may be, then and in that event the Party of the Second Part shall be fully answerable in damages to the Party of the First Part.

ESCROW AGREEMENT

IT IS MUTUALLY AGREED AND UNDERSTOOD by and between the parties that the First National Bank of Gunnison, Colorado shall be, and it hereby is, appointed as escrow agent to receive a copy of this contract and a Mining Deed, herein provided for, and the said agent shall also receive of the Party of the Second Part for the use and benefit of the Party of the First Part all payments herein mentioned to be made, with the exception of the down payment of Five thousand ($5000.00) Dollars, and the said escrow agent shall account for any sums so received to the Party of the First Part, and upon the payment by the Party of the Second Part of all of the sums herein mentioned to be paid by it, the said escrow agent shall thereupon deliver the said Mining Deed to the Party of the Second Part, one of its officers or its duly authorized attorney or agent.

The Party of the First and Second Part hereby agree with the said escrow agent that they will hold the said escrow agent free and harmless from all expense and liability on account of acting as such agent, and that said escrow agent shall not be held liable for the interpretation of any question of law or fact which may arise between the parties on account of this contract or the subject matter thereof.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals this 26th day of November, A. D. 1948, in triplicate, each copy considered an original.

/s/ ROD FIELDS
Party of the First Part

BERYLLIUM MINING CO. INC.,
a State of Washington Corporation,

By /s/ J. R. WEMLINGER
President

STATE OF COLORADO)
) SS.
County of Gunnison)

I, Robert G. Porter, a Notary Public, in and for said County, in the State aforesaid, do hereby certify that ROD FIELDS personally known to me as the person whose name is subscribed to the above and foregoing Contract of Sale, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument of writing as his free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and Notarial Seal this 26th day of November, A. D. 1948.

My Commission expires October 7, 1952.

(SEAL)

/s/ ROBT. G. PORTER
Notary Public

STATE OF COLORADO)
) SS.
County of Gunnison)

I, Robert G. Porter, a Notary Public in and for said County, in the State aforesaid, do hereby certify that J. R. WEMLINGER, personally appeared before me this day and acknowledged before me that he signed the above and foregoing Contract for Sale as the President and on behalf of, the Beryllium Mining Co. Inc., a State of Washington Corporation, as the free and voluntary act of said Corporation for the use and purposes therein set forth.

Given under my hand and Notarial Seal this 26th day of November, A. D. 1948.

My Commission expires October 7, 1952.

/s/ ROBT. G. PORTER
Notary Public

(SEAL)

MINING LEASE--

C O P Y

THIS AGREEMENT OF LEASE, Made and entered into this First day of March, A.D. 1952, by and between FRED A. NICHOLS, Evergreen, Colorado, party of the first part, and THE BERYLLIUM MINING CO., INC., Seattle, Washington, party of the second part, WITNESSETH, That the said party of the first part, for and in consideration of the rents, covenants and agreements hereinafter expressed to be paid, kept and performed by the said party of the said second part, has leased, let and demised, and by these presents does lease, let and demise unto the said party of the second part, the following described premises, to-wit:

> South Slope No. 1, Lode Mining Claim, described in Amended Location Certificate No. 201639, and recorded in Book 260, Page 104, County of Gunnison, Colorado, this being the same lode originally located on the second day of April, 1948, and recorded on the second day of June, 1948, in Book 255, Page 346, County of Gunnison, Colorado.
>
> South Slope No. 2, Lode Mining Claim, described in Amended Location Certificate No. 201640, and recorded in Book 260, Page 104, County of Gunnison, Colorado, this being the same lode originally located on the 12th day of April 1948, and recorded on the second day of June, 1948, in Book 255, Page 347, County of Gunnison, Colorado.
>
> These further and amended certificates of location are made without waiver of any previously acquired rights, but for the purpose of correcting any errors in the original location, description, or record.

TO HAVE AND TO HOLD, For the purpose of mining, for the term of Ten(10) Years from the date hereof. Said party of the second part, for and in consideration of the premises aforesaid, has covenanted, contracted and agreed, and by these presents does covenant, contract and agree with said party of the first part his heirs, executors, administrators, successors or assigns, to commence work on said premises on or before August 1, 1952 and to work the same continuously and with reasonable diligence, in thorough and workmanlike manner; performing thereon at least (20) Twenty shifts of work, of Two (2) men each, during every calendar month of the life of said lease; keeping the same securely timbered in all parts during the term of this lease; to keep accurate accounts, and to render Monthly statements, accompanied by vouchers, to the said party of the first part, his agent or attorney, showing the amount of all ore taken from said premises, and the yield of the same, and the cost of hauling and milling the same, and to pay by the 20th of each month succeeding, to said party of the first part, his agent or attorney, as rental for said premises, as follows, to-wit:

> Twelve per cent (12%) of the proceeds from sale of all extracted ores and materials, net selling price of which is $400.00 or over, per short ton. Ten per cent (10%) of the proceeds from sale of all extracted ores and materials, net selling price of which is $100.00 to $399.99 inclusive, per short ton. Five per cent of the proceeds from sale of all extracted ores and materials, net selling price of which is less than $100.00 per short ton. Net selling price, upon which all royalties are figured, shall be the

gross selling price, less transportation charges (hauling, freight, or other transport charges, including Federal tax), assay and sampling charges, where applicable, and mill or smelter treatment charges.

It is hereby agreed, as follows, to-wit:

That the payment of royalties from the sale of all extracted ores and materials, "by the 20th of each month succeeding", shall be subject to the receipt by the Party of the Second Part, of settlement from the ore buyer, for such extracted ores and materials sold to him.

That the above requirement as to the number of shifts per month shall be determined and be subject to weather conditions and other conditions referred to as "Acts of God".

That the above requirement as to the number of shifts per month shall be eliminated, and of no consequence, for a period of one year from date of lease, if the Party of the Second Part puts into full force and effect, a program of exploration, to include core drilling and trenching, prior to August 1, 1952.

Said party of the second part furthermore agrees that the said party of the first part, his agent or attorney, shall have the right at any and all times to enter upon and descend into any and all parts of said premises, and that the said party of the second part will render to him all the assistance in his power in so doing.

Said party of the second part furthermore agrees that in case he fails to commence work on said premises as aforesaid, or to work the same continuously and with reasonable diligence and in workmanlike manner, or to keep the same securely timbered, or render said statements, or to pay said rental as aforesaid, or in any respect to keep and fulfill any and all agreements herein expressed or implied, then, and in that case, it shall be lawful for the said party of the first part, his agent or attorney, to declare this lease void and of no effect thereafter, and without process of law to enter upon and take possession of said premises; and also at the expiration of this lease by limitation, said party of the second part agrees to surrender, yield and deliver to said party of the first part, his heirs, administrators, executors, successors and assigns, quiet and peaceable possession of said premises in good condition, unless extended or renewed by mutual agreement.

It is further provided and agreed that any entry upon said property, by the Party of the First Part, for the purpose of inspecting, sampling, or surveying, or for any other reason, excepting repossession as herein agreed to, shall in no wise be done at such time or in such a way as to interfere with the operation of the said property as covered by the terms of this lease.

It is also further provided and agreed that the Party of the First Part shall notify the Party of the Second Part in writing, by registered mail sent to the address of said Party of the Second Part, of any violations of any covenants hereinabove reserved, stating specifically such violations, and Party of the Second Part shall thereafter have 60 days in which to cure

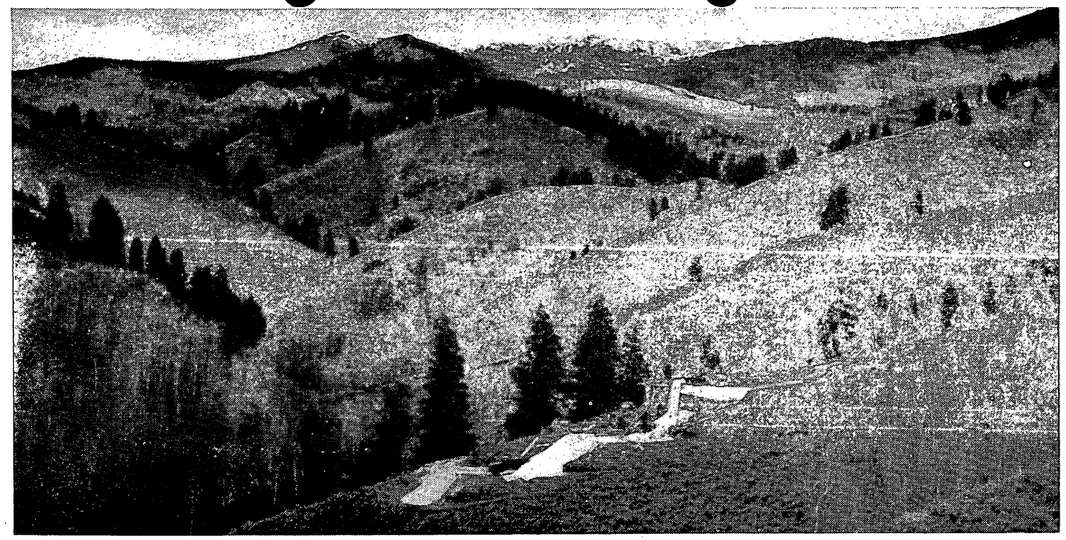
and correct or remedy the matter concerning which any violation or default of the terms as set forth herein. It is further agreed that any delays or interruptions that may occur by any Acts of God, strikes or violence or acts of war not within the control of the Party of the Second Part, shall not be deemed violations of this lease.

It is further mutually agreed that the foregoing covenants and agreements herein contained shall be covenants running with this said lease and leasehold estate, and shall be binding upon all subsequent assignees and grantees, and parties hereafter acquiring any interest in said premises.

IN WITNESS WHEREOF, The parties hereto have executed these presents the day and year first above written.

/s/ Fred A. Nichols
Lessor - Fred A. Nichols

Lessee - Beryllium Mining Co., Inc.
By: /s/ Charles A. Wemlinger
Charles A. Wemlinger, Vice President



WIDE PEGMATITE DIKES, several thousand feet long cut across this part of Gunnison County, Colo., near Ohio City. Mica mill for recovery of scrap mica is shown in foreground. See detail of mill on next page.

Colorado Pegmatite Deposit Yields Beryl and Mica

White gashes on the mountainsides bordering Willow Creek in Gunnison County, Colo., mark the workings of pegmatite miners. The author presents a firsthand account of what goes on at these interesting mineral deposits bearing beryl, mica, feldspar, columbite, samarskite and other rare earth minerals.

CHARLES A. WEMLINGER
Vice-president in Charge of Operations
Beryllium Mining Co., Inc.
Gunnison, Colo.

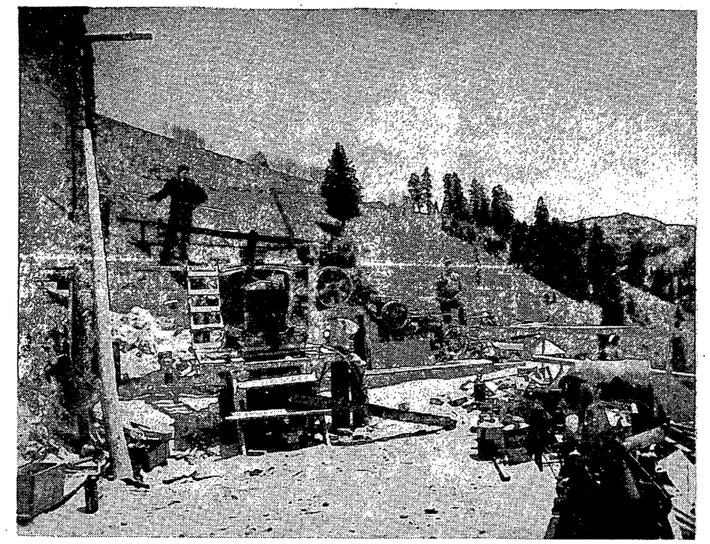
OPEN-PIT OPERATIONS of the Beryllium Mining Co., Inc., are situated on Willow Creek in the Gold Brick mining district of Gunnison County, 21 miles east of Gunnison, and approximately 1 mile from Ohio City.

Ore is extracted from a pegmatite formation approximately 4,000 ft. long and 2,500 ft. wide, which is composed mainly of graphic granite and quartz albite. At present neither of these minerals is being mined except where necessary to gain access to the pods or cores of more important minerals. These minerals, listed in order of importance, are: potash feldspar, scrap mica, beryl, columbite-tantalite, monazite, and samarskite. Minor amounts of other minerals have also been found. The upper part of the dike rises to an elevation of almost 9,700 ft.

All mining is done by open-pit methods. After each blast, the loose material is examined for any of the important minerals such as large books of mica, beryl, etc. Wherever possible these minerals are mined directly from the working face before blasting is done to prevent shattering by blasting. Mining from the face is done almost entirely by hand. However, sometimes a shallow hole is drilled close to a beryl crystal and ¼ to ½ stick of dynamite used to dislodge the crystal from the surrounding quartz.

While drilling is being done, the chips from the drill are examined closely for any signs of beryl to prevent shooting a charge too close to a crystal or within a crystal. After loose material has been sorted, it is bulldozed to the stockpile, from where it will be run through the mill for additional mica recovery. Any loose material that is barren of mica is bulldozed to one side into a dump.

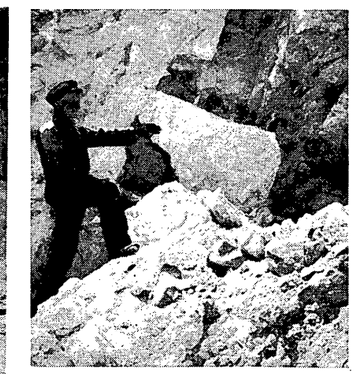
Beryl crystals, probably due to their order of crystallization from solutions, appear to be full of minute cracks, and are readily broken into many small pieces if roughly handled. The bull quartz will withstand severe abuse, but beryl will break into pieces if caught by the bulldozer blade. The same is true of rare earth minerals, and consequently their recovery is rather slow. Although some of the mica crumbles when touched, most of it is very flexible. Those pieces which are too small to be recovered by hand sorting can be recovered for the most part by the mill.



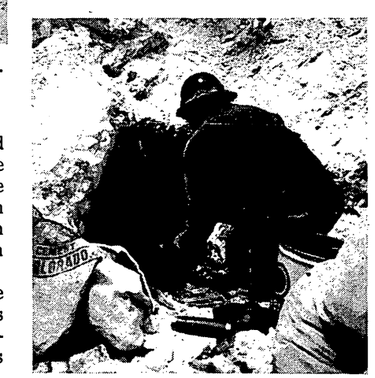
MICA-BEARING ORE is cascaded over crusher rolls and screens in series. 90 to 95% of mica is recovered as scrap mica.

BERYL CRYSTAL pointed out by R. Riddle of the operating staff.

OPEN-CUT MINE in pegmatite yields mica, beryl, feldspar and other minerals. Bulldozer in foreground loads trucks with ore.



FELDSPAR CRYSTAL BOUNDARY shows up clearly in exposed wall of open-cut operations.



BOOK OF MICA is being carefully removed by worker. Much of the mining is hand work.

How the Mica Mill Works

Material from the stockpile is hauled by truck to an ore bin above the mill. Here a grizzly removes all of the oversize before it enters the bin. From the bin the material goes into a jaw crusher where larger pieces are broken down, and the imbedded mica freed from the quartz or feldspar. Crushed ore moves over a shaker screen which removes all of the minus 6-mesh fines. Plus 6-mesh material goes on to a roll crusher.

Before this product enters the rolls, however, any plus 3-in. slabs of mica are removed. The rolls reduce all other material to minus ⅝-in. Then the cycle is repeated, and minus 6-mesh fines are removed, and the plus ⅝-in. mica is recovered. Minus ⅝-in. plus 6-mesh

material moves on to a second set of rolls where it is further reduced to ⅜-in. The final roll reduces the material to minus 6-mesh. All of the mica recovered from the screens is fed into a storage bin, and minus 6-mesh fines are stockpiled. Probably 90 to 95% of the mica is recovered as scrap mica by this method, the balance going through the fine screens. The mica mill shown above is being rebuilt to handle larger capacity and to improve recovery.

Marketing of Minerals

In the past, pegmatite dikes were often mined for just one mineral and then abandoned after that mineral became exhausted. Sometimes dikes like these were shut down and reopened several years later to be mined for an entirely different mineral. In recent years, the trend has been toward the recovery of as many commercial minerals at one time as possible. Much of the value of pegmatite minerals depends on the location of the operation with respect to a standard-gage railroad loading point. Consequently many pegmatite operations have been abandoned because low-value minerals such as feldspar could not be mined and shipped profitably.

In order to get at the rarer and more profitable minerals, considerable tonnages of dike material have to be moved, and the more of this tonnage which can be sold, the more profitable the operation. If a small pegmatite mine operator can mine enough mica and feldspar to carry the costs of operation, he can usually store his beryl and rare earths until he accumulated a good tonnage. However, most operators have to sell the beryl as fast as it is mined to stay in business. Consequently they do not get the higher prices that carload lots of beryl command.

Feldspar in a crude state does not bring a very high price, and unless it can be shipped to a nearby market at a low cost, it certainly cannot be counted on as a revenue producer. Even stockpiling of feldspar is costly and of questionable value despite the excellent quality of the mineral available.

A recent development at this property has been the opening of a new beryl deposit lower on the mountainside than that shown on p. 92. Here the beryl is much cleaner and harder than that found in the upper dike, where weathering has apparently taken its toll. Thus far, the new deposit has yielded about 15 tons of beryl.

Printed in U.S.A.

WIDE PEGMATITE DIKES, several thousand feet long cut across this part of Gunnison County, Colo., near Ohio City. Mica mill for recovery of scrap mica is shown in foreground. See detail of mill on next page.

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White gashes on the mountainsides bordering Willow Creek in Gunnison County, Colo., mark the workings of pegmatite miners. The author presents a firsthand account of what goes on at these interesting mineral deposits bearing beryl, mica, feldspar, columbite, samarskite and other rare earth minerals.

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Vice-president in Charge of Operations
Beryllium Mining Co., Inc.
Gunnison, Colo.

Reprinted from ENGINEERING AND MINING JOURNAL November 1950

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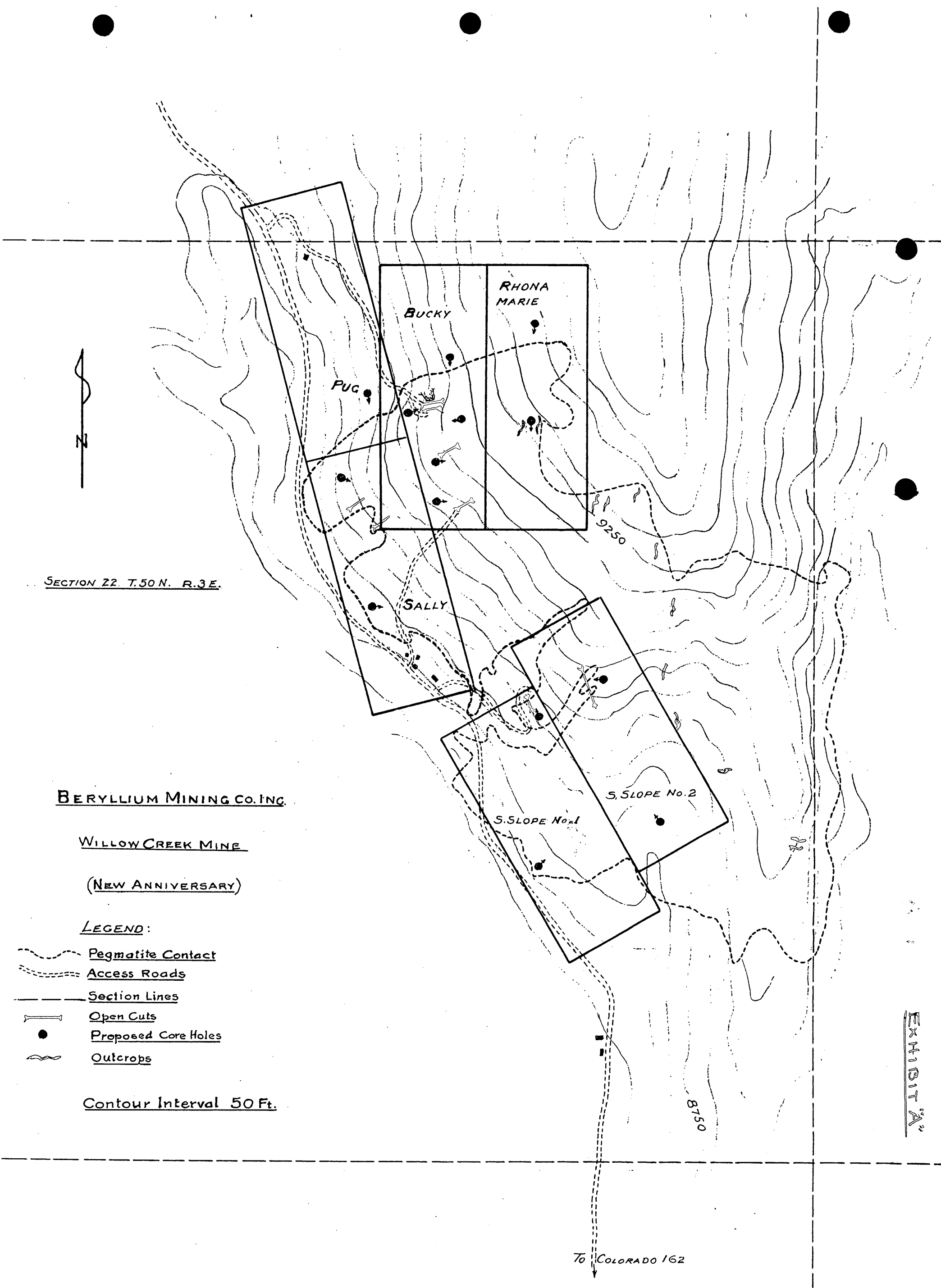
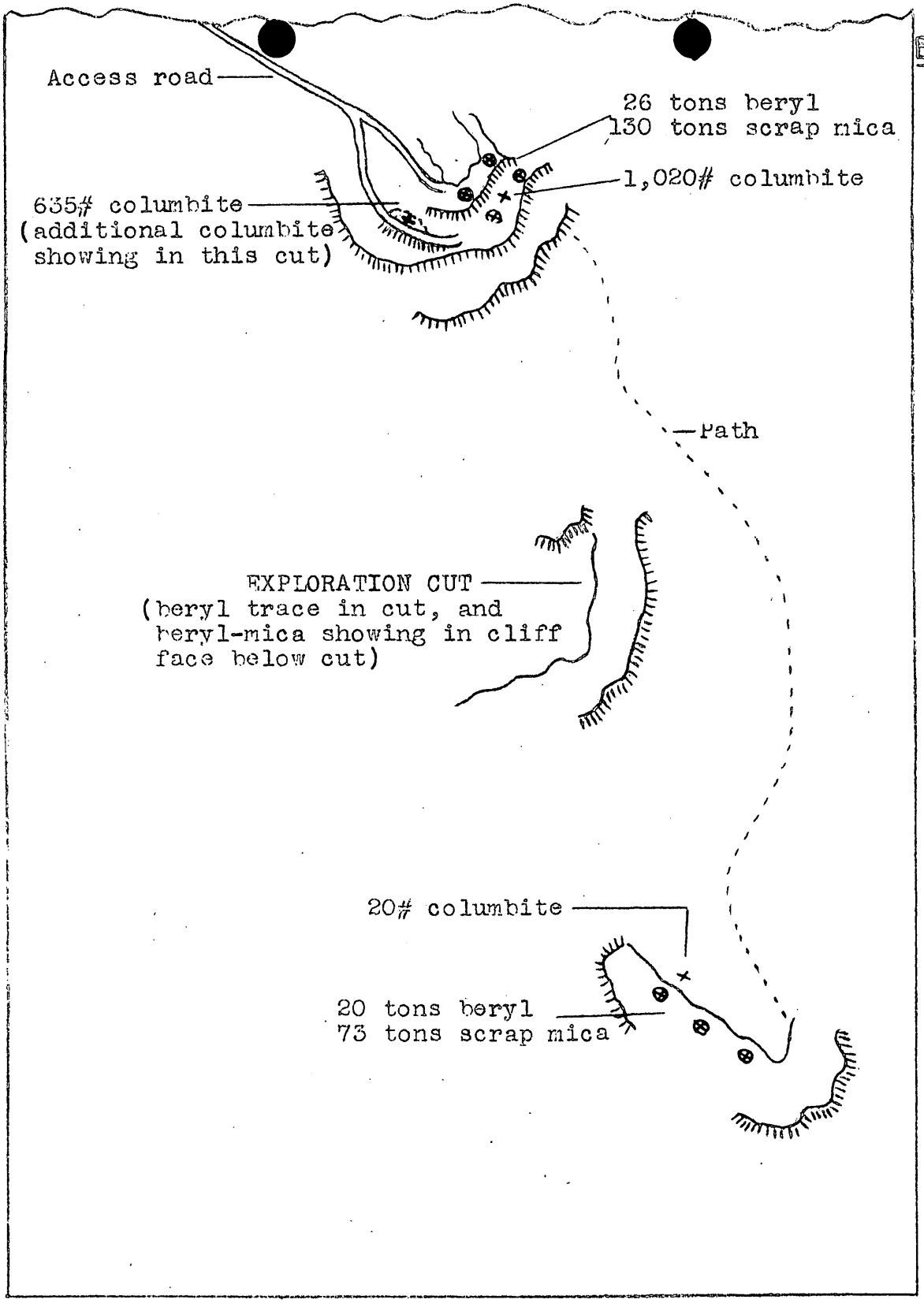

SECTION 22 T.50 N. R.3 E.
BERYLLIUM MINING CO. INC.
WILLOW CREEK MINE
(NEW ANNIVERSARY)
LEGEND:
Pegmatite Contact
Access Roads
Section Lines
Open Cuts
Proposed Core Holes
Outcrops
Contour Interval 50 Ft.
N
BUCKY
RHONA MARIE
PUG
SALLY
S. SLOPE No. 1
S. SLOPE No. 2
9250
8750
TO COLORADO 162
EXHIBIT "A"

EXHIBIT "B"

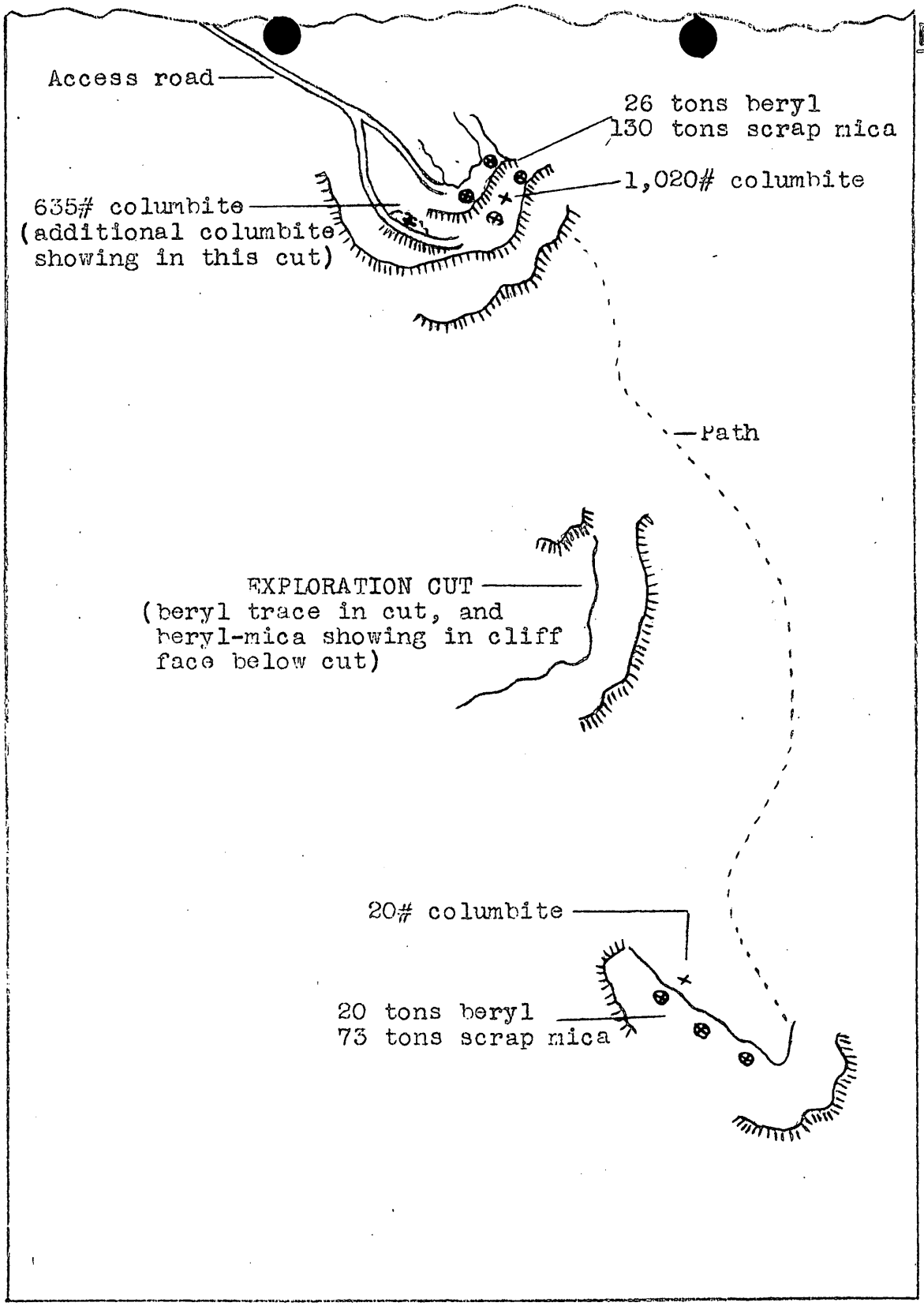


South portion of Bucky Claim showing principal workings as of December 31, 1951

Scale: 1" to 100'

Beryllium Mining Co. Inc.
920 - 2nd Avenue
Seattle, Washington

EXHIBIT "B"



South portion of Bucky Claim showing principal workings as of December 31, 1951

Scale: 1" to 100'

Beryllium Mining Co. Inc.
920 - 2nd Avenue
Seattle, Washington