UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Rapid City Field Office
School of Mines Campus
Rapid City, South Dakota

Date Rec'd
JAN 10 1955
BUREAU OF MINES
Denver, Colorado

January 6, 1955

Memorandum

To: W. H. King, Executive Officer, DMEA Field Team, Reg. III

From: E. O. Binyon, Rapid City Field Office

Subject: Docket 1367 (Beryl-mica), Mineral Mills, Inc., Old Mike Pegmatite, Custer County, S. Dak.

Enclosed are copies of all the material we have in the files on the subject Docket 1367. However, there are two other docket and contract numbers, 2168X, Idm E-376, and 2877, Idm E-530, on the property and company. Of these, the Docket 2877, Contract Idm E-530, is the only one that was in effect and was completed. The correspondence etc. for the subject docket, as well as 2168X, Contract Idm E-376, probably will be found in the file for Docket 2877, Contract Idm E-530.

E O Binyon

E. O. Binyon

cc: files

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DEFENSE MINERALS ADMINISTRATION

September 7, 1951

Mr. A. B. Needham, Executive Officer
DMA Field Team, Region V
2908 Colfax Avenue South
Minneapolis, Minn.

Re: DMA-1367
Mineral Mills, Inc.

Dear Mr. Needham:

Please review the attached application of Mineral Mills, Inc., for a loan in the amount of $150,000, arrange suitable field examination and report on the project, particularly, with respect to the following:

1. Applicant's reserve estimates are considerably higher than indicated by U.S.G.S. data. Can applicant produce substantiating data, based perhaps, on later work or work the results of which have not heretofore been made available to the Survey.

2. Are reserves adequate to justify the proposed loan? If not, is additional exploration advisable and should it be undertaken under our Exploration Program?

3. Applicant states that a portion of the loan would be used to "develop technological processes." What amount would be so used? Applicant should be asked to supply rather complete details on the proposed experimental work. Does this work appear advisable, what is the likelihood of success and is the applicant technically competent to undertake such work?

4. Applicant proposes to augment present mining equipment with a power shovel and wagon drill. With these additions would applicant's mining equipment be adequate for the proposed operation? Applicant should be requested to provide specifications of the shovel and drill equipment.

5. Applicant should supply details on proposed mining and haulage to mill both for ore in place and from dumps. A complete cost breakdown should be furnished on a daily and tonnage basis supported by a schedule of costs relative to manpower (with an itemized list of personnel, wages and salaries), power, supplies, replacements, etc.

6. Applicant should supply an itemized list of equipment additions proposed for mill (including sorting equipment), with cost breakdown.

7. A detailed estimate of milling costs should be obtained with adequate breakdown into labor, power, supplies, maintenance, etc.

8. Feasibility and adequacy of proposed milling process should be reviewed.

9. Is applicant technically competent to undertake the proposed operation?

10. Has applicant exhausted the possibility of liquidating outstanding indebtedness privately?

11. The Washington office of the R.F.C. does not have a complete file on applicant's previous record with regard to Government loans; this information is in the Minneapolis R.F.C. Field office. It is suggested that you discuss the case to the extent you consider necessary with the R.F.C. Minneapolis office.

12. Discuss with applicant his proposal for repayment; it would be desirable for repayment to be scheduled over a 5-year period.

13. Comments and recommendations.

In connection with securing details on mining and milling methods and detailed cost data from applicant, it may be necessary for the Field Team to render some technical assistance to applicant.

Sincerely yours,

/s/ Tom Lyon

Tom Lyon, Chairman, Coordinating Committee

Approved:

/s/ Lowell B. Moon
U. S. Bureau of Mines

/s/ T. P. Thayer
U. S. Geological Survey

November 25, 1952

COPY

Reconstruction Finance Corporation
Washington 25, D. C.

Attention: Mr. S. A. Bingham

Gentlemen:

Reference is made to request of Mineral Mills, Inc., Custer, South Dakota, for a loan in the amount of $150,000 and docketed as DMA-1367, DPA-MIN-440,549.

Applicant proposed to rehabilitate a mica sorting and grinding plant, adding froth-flotation and other equipment to permit recovery of beryl and columbite-tantalite as well as scrap mica and feldspar. Additions to existing mining plant are also contemplated. Applicant also proposes to undertake research to develop recovery methods applicable to his ores as evidenced by his statement that his proposal "is a combination project to develop technological processes for beryl separation by flotation and to produce essential materials to include beryl, columbite-tantalite and strategic mica."

Proposed use of requested funds is as follows:

Additions to mining facilities	$14,500
Additions to sorting facilities	16,250
Additions to milling plant facilities	52,850
Addition to mill buildings	15,000
Working capital	21,400
Water supply system	10,000
Repayment of indebtedness	20,000
Total	$150,000

Subject application was originally reviewed by the Industrial Minerals Branch of the now defunct Defense Minerals Administration who concluded that data presented did not establish adequate ore reserves to justify the undertaking, nor did the data substantiate the feasibility of the proposal from the standpoints of adequacy of mining and milling methods, operator competence or possible financial returns. The case was referred to Defense Minerals Administration Field Team, Region V, for additional review and comment.

In October, 1951 the Field Team reported that in their judgment proven ore reserves were not adequate to justify the requested loan but that additional exploration was justified and recommended. The Field Team did not pass on the other points in question pending a final determination of adequacy of reserves. They assisted applicant in preparing an application for exploration assistance on a matching fund basis, forwarding this to Washington for action by Defense Minerals Administration - Defense Minerals Exploration Administration. In view of this Defense Materials Procurement Agency (to whom subject application had been transferred) decided to withhold further action pending completion of exploration to be undertaken under a Defense Minerals Exploration Administration contract.

Defense Minerals Exploration Administration conducted negotiations with applicant over a period of several months in an attempt to finalize a mutually satisfactory exploration contract. The case was referred to Defense Minerals Exploration Administration Field Team for their review and a contract submitted to applicant through the Field Team. Applicant rejected the contract which was returned to Washington by the Field Team in September 1952, accompanied by a report concluding as follows:

"The Field Team recommends that the contract under consideration should not be completed and the application be denied on the basis that a significant discovery is highly improbable."

Under these circumstances, it is our conclusion that a proven ore reserve adequate to justify applicant's loan request has not been demonstrated; therefore it is our determination not to issue a "Certificate of Essentiality" as required under Executive Order No. 10281 and we recommend denial of the loan under Section 302 of the Defense Act of 1950, as amended.

Yours very truly,

/s/ Tom Lyon

Tom Lyon, Director
Domestic Expansion Division

UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, SECRETARY

DEFENSE MINERALS ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
[illegible]

DRAFT

Old Mike Mine, Custer District

Custer County, South Dakota

Glen Walker, Mining Engineer
U. S. Bureau of Mines

J. A. Redden, Geologist
U. S. Geological Survey

October 5, 1951

DEFENSE MINERALS ADMINISTRATION
Report of Field Examination

by

Clem Walker, Mining Engineer
U. S. Bureau of Mines

J. A. Redden, Geologist
U. S. Geological Survey

Docket No.: DMA-1567
Property: Old Mike
Applicant: Mineral Mills, Inc.
Commodity: beryl, mica, tantalite

Conclusions and Recommendations

The exploration, as outlined by the applicant, appears to be reasonable and adequate to determine the reserves of mica, beryl and tantalite in the Old Mike pegmatite.

The applicant has applied for a $150,000 loan to expand the facilities and production of this property. This application, Docket No. DMA-1567, has been examined and partially considered by the field team. After consultation with A. I. Johnson, manager of Mineral Mills, Inc., regarding reserves, such a large discrepancy became apparent that the field team suggested an exploration loan application be submitted. The reason for this suggestion was that the reserve figures of both the applicant and the field team were not based upon sufficiently concrete evidence, the underground workings are inaccessible, and the accuracy of former grade analyses is questionable. The field team collaborated with the applicant on the location and feature of core holes and channel samples as outlined in the exploration application. The applicant requests that DMA-1567 be held in abeyance until the proposed exploration is completed.

It is recommended that this exploration project be accepted.

Exhibit A

As set forth in the application, the exploration is to be divided into two phases, A and B. Phase A is the cutting of 14 channel samples from various points on pegmatite outcrops (see map) and one sample from the old dump on the Great Northern claim. These 15 samples will be analyzed by different methods and personnel for beryl. If the analysis indicates a sufficient grade, then Phase B will be pursued. It should be pointed out that, because past experience in analyzing material of this general tenor for BeO has cast some doubt on the results, it is felt that the method outlined of analyzing a comparatively large number of pulps by various methods and concerns will result in an acceptable figure. The field work of this phase will require about 3 weeks to complete.

Phase 3 includes five diamond core drill set-ups along the strike of the pegmatites on the Great Northern claim (see map). At least one BX hole, and possibly two, will be drilled from each set-up, with a total maximum footage of 1,750 for the project. This phase should be completed within 6 months.

All the minerals on which this application is based fall in the 90 percent government participation category.

Geologic Report

The Old Mike mine is located on two zoned pegmatites in sec. 2, T. 3 S., R. 4 E., about 3 miles north-northwest of Custer, South Dakota. The mine and pegmatites have been mapped in detail by the U. S. Geological Survey, and complete reports and maps are available. The main purpose of this investigation is to check the reserve figures of the applicant.

A crosscut adit and a glory hole leading to the adit have exposed the main pegmatite in some detail, and smaller open cuts have explored the upper part of the smaller pegmatite.

Very little additional work has been done at the mine since the Geological Survey completed the open file maps and sections on the Old Mike pegmatite. The applicant states that a 30-foot winze was completed below the level of the adit since the open file maps were prepared; this winze is inaccessible at present. In addition, about 1,000 tons of pegmatite have been blasted from the central portion of the main pegmatite.

The richest ore in the main pegmatite occurs in the wall zone and an intermediate zone of el-mayulandite-quartz pegmatite. The wall zone has been sub-divided during mapping into an outer unit of albite-muscovite-quartz pegmatite and an inner unit of albite-quartz-muscovite pegmatite. Beryl and scrap mica occur in both the wall and intermediate zones, and columbite-tantalite occurs in the intermediate zone. Perthite is another economic mineral occurring as a "hood" in the upper part of the pegmatite.

Reserves and Recommendations

A visual estimate of the grade of the beryl in the wall zone is 0.5 percent beryl. This is in agreement with previous estimates of the Geological Survey. The outcrops of the wall zone are coated with limonite and phosphate (?) stains, so that mineral area counts are not reliable. The intermediate zone is poorly exposed, but the previous estimate of 1.0 percent beryl made by the Geological Survey appears to be reasonable.

The applicant states that the grade of the beryl in the pegmatite is 2 percent. This figure is based on sampling by the U. S. Bureau of Mines, Brush Beryllium Corporation, and Metals Reserve Co. It is true that the results of this sampling indicated an average of 0.20 percent BeO, both on fresh ore and in dump samples.

It is believed that these analyses are erroneous. The analyses by the Bureau of Mines were made during World War II at Rolla, Missouri, using a precipitation method of chemical analysis which was later proved to be unreliable. The method gave BeO values which were considerably too high. The assays of Brush Beryllium Corporation were apparently made by the Saratoga Laboratories in the early part of 1948. It was subsequently proved by the Geological Survey that BeO determinations made by Saratoga Laboratories before October, 1948 (when a change was made in spectrographic technique) were of questionable accuracy.

The applicant listed the ore tonnage at 175,000 tons. This tonnage is necessary for a 5-year operation of the mill. This estimate is supposed to include the entire tonnage of the two pegmatites and does not take into account the "barren" ore or quartz core in the main pegmatite.

New computations were made of the ore reserves (wall zone and intermediate zone of the pegmatite) which gave 65,000 tons of ore, of which 40,000 tons could be regarded as proved and 25,000 tons as probable ore. It is very likely that there is at least 75,000 tons of minable ore, the previous estimate of the Geological Survey. There is a possibility that there would be 150,000 tons of ore, or equal to the tonnage claim of the applicant.

The recoverable value, based on the Geological Survey's estimate of beryl percentage, of about 45,000 tons of the ore in the main pegmatite is approximately $5.00 per ton. Similarly, the recoverable value of 17,500 tons of the ore in the smaller pegmatite is about $4.50 per ton.

More exploration is needed to warrant the proposed plant expansion. This was discussed with the applicant and it was recommended that the applicant undertake a two-phase exploration program to prove: 1) the content of the beryl in the ore, and 2) the total ore tonnage.

The first phase of the exploration would consist of the taking of properly located samples from the core zones of the main pegmatite and the wall zone of the smaller pegmatite. These would be analyzed for BeO by the most modern techniques. The Bureau and Survey would probably also take portions of the samples in order to check assay results.

If the results of the sampling indicate that the grade of the ore is sufficiently high (the cut-off grade of beryl is between 1 and 2 percent for this operation), then phase 2 of the exploration would take place. It would consist of approximately 1,750 feet of diamond drilling and the assaying of the pegmatite drill core. This drilling footage will be adequate to "prove" the required 5 years of ore reserves, providing of course that there are sufficient reserves of ore present.

Since the major part of the proposed work will be contracted for, no manpower problem is anticipated.

The applicant will furnish all equipment and supplies necessary for the project.

The exploration will be confined to the Great Northern claim, of the Old Mike group, which is easily accessible by about 2 miles of a company maintained, crushed rock, one-way road.

Water for this project is ample and available from a nearby spring. The power to be used is gasoline and will be delivered in barrels.

The project will be supervised by A. I. Johnson, who is a graduate of the South Dakota School of Mines and who has had several years experience managing pegmatite operations. He is assumed to be capable of the responsibilities involved in this project.

Phase A:

2 samplers @ $1.25 per hour, plus 8% for taxes and insurance @ $21.20 per day for 15 days	$ 318.00
Analysis of 60 pulps (4 cuts from 15 samples) @ $15.00 each	900.00
Total for Phase A	$1,218.00

Phase B:

1,750 feet AX diamond core drilling @ $5.00 per ft.	$ 8,750.00
Analysis of 40 pulps @ $15.00 each	600.00
Total for Phase B	$ 9,350.00
Total cost of project	$10,568.00

Phase A can start immediately after the contract is signed and will require 3 weeks to complete. No reasonable estimate is possible of the time required for the analytical work, but as aforestated, Phase B will not be started until favorable results are obtained in this phase.

Phase B:

1st month - 350 feet of core hole
2nd month - 350 feet of core hole
3rd month - 350 feet of core hole
4th month - 350 feet of core hole
5th month - 350 feet of core hole
7 shifts of 6th month - 100 feet of core hole