DMA Form 1

DEFENSE MINERALS ADMINISTRATION
Control Slip

CONTROLLED DOCUMENT

DMA Docket No. 3149

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This document has been recorded as
Exploration Assistance

Any action taken to change the type of request for assistance must be promptly reported to the Reports and Records Branch. Use DMA Form 2 for submitting these reports.

1 cy. USBM , USGS and Region VII

Routing Slip

To:	Code 700	Date	8/28/53
To:	Oper Com.	Date	9-18-53
To:		Date	
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INT.-DUP. SEC., WASH., D.C. 98868

May 10, 1954

Note: Rutile, Monazite, & Thorium placed back on the strategic list again by DMEA-1 Amended March ~~28~~ 19, 1954.

E.W.E.

For the Government to get its return on the $43,000, the following indicated minimum factors are needed:

1. Total Gross value of monazite-rutile = $500,000.

2. Total monazite @ 20¢ lb. = 2,000,000 lbs
   Total rutile @ 5¢ " = 2,000,000 "

2,000,000 x 20¢ = 400,000
2,000,000 x 5¢ = 100,000
Total $500,000

Thus you would need 1,000,000 cubic yards of gravel running 2 pounds of monazite and 2 pounds of rutile per cubic yard

2 lbs. monazite = $.40
2 " rutile = .10
Total = $.50

Horse Cravi
1.6# M = 32¢
4# - 20¢
52
+ Gravel

Operating costs for small operation to handle 1,000,000 yards = 30¢ to 40¢ per yd.

However if you had 2,000,000 yds running 1 lb. monazite and 1 lb. rutile you would have the same total pounds of these minerals. But you would only have a gross value of $.25 per cubic yard while operating costs would only be reduced to about 25¢ to 35¢ per cubic yard.

No estimate is made for percent recovery of minerals which should be 80% of above

From Costs:

200 holes averaging 20' = 4,000 feet
A drill can be contracted for at $4.00 per foot making the total cost only $16,000.

A shed could be built for $500. and equiped with screens, tables and driers for another $2500. , Total = $3,000

2 samplers at the drill and another 2 men for hauling samples and concentrating them = 4 men - 200 days each = $8,000

1 engineer - 200 days at $40.00 = $8,000
(he also does bookkeeping - it's small)

Sampling equipment = 500.

Car for engineer = $2,000
Truck for samples = 3,000
Car and Truck expenses = 1,000

Sampling expenses = 500

Total = $43,000.

Shafts not needed & considered useless.

Docket
urname copy 700

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

Ellis

Mr. Caesar A. DeFlora
Monazite Mining Corporation
336 Hudson Street
Hackensack, New Jersey

Re: Docket No. DMEA-3149 (Thorium)
Denied September 21, 1953
Property near Golden Valley
Burke County, North Carolina

Dear Mr. DeFlora:

This will acknowledge receipt of your letter dated August 4, 1954, pertaining to the captioned application which was denied September 21, 1953. The results of the laboratory work which you enclosed with the letter, which work was performed by Carpco Engineering and Manufacturing Company on some concentrate, have also been noted. The letter gave no information as to how and where the concentrate was obtained, nor did it state the quantity of material from which the concentrate was produced.

At the conference held here on June 1, 1954, which Mr. R. M. Atwater, Jr. attended, it was explained to him that better proof of the thorium-monazite content than that revealed in the application, would be required before we could again consider an application covering the gravels in the Golden Valley area. This, Mr. Atwater said, would be done. However, the information accompanying your letter of August 4 fails to cast much light on the case. Furthermore, the application fails to show by map or sketch the location of the proposed work in relation to property lines and places where the samples were taken which resulted in the laboratory work done by Carpco Engineering and Manufacturing.

Until these points are cleared up, in the light of all the information we have on the general area through Government sources, I regret we will be unable to further reconsider your application.

Sincerely yours,

C. O. Mittenderf (for)

Administrator

EWEllis/gla
8-12-54
cc to: Admr. Reading File
Docket
Messrs. H. D. Keiser, Rm. 3641
A. P. Butler, Jr., Rm. 3212, GSA
J. O. Hosted, Rm. 3210, GSA
Code 700

MF-500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE 8/6

REFERRED TO:

1. 700
2. Mr. Collier
3.
4. Mrs. Ulert

FOR:

Action	Recommendation
Approval	Record of
Comment	
Conference	Referring to
Consideration	
Filing	Reply for signature of
Instructions	
Investigation	Rewriting
Initials	Signature
Mailing	Suggestions
Previous correspondence	Your information

REMARKS: Previous application DMEA-3149 (denied 9/21/53) used for background material in conference

Check (X) before the items needing attention.

ROBERT E. ADAMS
Initials of sender.

GPO 16—68815-1

We have no record of new application.

a. Ch.
8-9-54

MONAZITE MINING CORPORATION
336 HUDSON STREET
HACKENSACK, N. J.

August 4, 1954.

Defense Minerals administration
RECEIVED
AUG 6 - 1954

Defense Minerals Exploration Administration,
U. S. Department of Interior,
Washington 25 D. C.

DMEA-3149

Attention: Mr. Ernest W. Ellis.

Dear Sir:

Some time ago Monazite Mining Corporation filed an application for a loan from Defense Minerals Exploration Administration.

On June 1, 1954, a meeting was had between yourself, Mr. Atwater, representing the company, and Messrs. Griffith and Carlson of the Bureau of Mines, and others in connection with the application. You will recall at that time it was stated that it was the opinion of the Bureau of Mines that the application could not be considered without further preliminary tests being made by the company. In fact, it was stated that there was no proof that the area owned by the company carried any monazite sand at all. Mr. Atwater then pointed out that the company had accumulated some bulk concentrate which had been stored and it was suggested that this concentrate be made subject to the Carpenter Test and, depending upon the outcome of the test, it might or might not be necessary to make further tests on the ground with Bureau of Mines personnel present.

Enclosed herewith are two previous analyses of monazite heavy sands which were produced on the company's property, It is our opinion that perhaps, in light of these tests, the requirement of the Carpenter Test or the shaft sinkings may be unnecessary.

After you have had a chance to review the enclosures , we would appreciate your advice and opportunity of discussing the results set forth therein.

Very truly yours,

MONAZITE MINING CORPORATION.

Caesar A. DeFlora

Caesar A. DeFlora.

CARPCO ENGINEERING AND MANUFACTURING
Consulting Engineers - Manufacturers - Designers
JACKSONVILLE 6, FLORIDA

ADDRESS MAIL TO
P. O. Box 3272

PLANT LOCATION
HAINES AT 32ND STREET

November 7, 1952 Jovs 45283

Mr. C. A. De Flora
Monazite Mining Corp.
Oradell, New Jersey

Jacksonville 4-5483
Mr J. Neill Brewster
Home Phone Jacksonville 9-0198

Dear Mr. De Flora:

The various fractions produced from your heavy mineral concentrate are being forwarded to you at Oradell by railway express. The percentages gained from the larger sample varied somewhat from those produced from the small sample. The data on these fractions follows:

Sample No.	Percentage	Description
341-3	21.7	Garnet fraction
341-4	11.5	Zircon fraction
341-8	5.2	Monazite fraction
341-5	0.2	Paramagnetic fraction
341-6	60.2	Ilmenite fraction
341-7	1.2	Rutile fraction

The laboratory reported to us today by phone that the columbium content of the ilmenite fraction (341-6) was 0.07 percent. They expect to have the tantalum analysis by the first of the week. We will notify you immediately upon receipt of this information.

Very truly yours,
CARPCO ENGINEERING AND MANUFACTURING

Robert V. Spencer

RVS/f

Robert V. Spencer

Attention: Mr. Henri M. Weil

To: Monazite Mining Corporation
336 Hudson Street
Hackensack, New Jersey

Ref: Your phone call 6-10
Sheet No. 1
Date: June 15, 1953
Project: 505

Subject: Report of the Laboratory Investigation of Bulk Sample of Heavy Mineral Concentrate Submitted by the Monazite Mining Corporation.

Summary:

The bulk sample was pre-heated to remove all moisture and then separated into mineral fractions by combined high tension and induced roll magnetic separation methods. From these fractions products were obtained by gravity or by dry milling methods on a combination of the two in accordance with the flow sheet prepared at the time. Products were obtained from this test in accordance with the following tabulation.

Sample No.	%	Product
505-8 and 505-10	45.5	Ilmenite
505-9	2.5	Coarse Garnet
505-7	2.5	Rutile Fraction (Nonmagnetic conductors)
505-13	3.7	Monazite
505-16	8.2	Minus 80 mesh magnetic product from Monazite fraction tabled tailings.
505-17	2.7	Plus 80 mesh magnetic product from Monazite fraction tabled tailing. Mostly garnet.
505-18	9.0	Non-magnetic product from the monazite fraction tabled tailing. Contains some Kyanite

attention: Mr. Henri M. Weil

To: Monazite Mining Corporation
336 Hudson Street
Hackensack, New Jersey

Ref: Your phone call 6-10
Sheet No. 2
Date: June 15, 1953
Project: 505

Subject: Report of the Laboratory Investigation of Bulk Sample of Heavy Mineral Concentrate Submitted by the Monazite Mining Corporation.

Summary con't.

Sample No.	%	Product
505-20	9.4	Tabled zircon concentrate
505-21	2.7	Tabled zircon middlings (Should go to Cons or Tails and not be a separate product)
505-22	12.1	Tabled zircon tailings, essentially quartz.
505-2 and 505-11	1.7	Magnetite
	100.0	

Very truly yours,

Robert V. Spencer

CARPCO ENGINEERING AND MANUFACTURING

RARE AND PRECIOUS METALS BR.

Save for our files

MONAZITE MINING CORPORATION

336 HUDSON STREET
HACKENSACK, N. J.

GOLDEN VALLEY
BOSTIC, N. C.

May 8-54.

Mr. Robert F. Griffith
United States Department of the Interior
Bureau of Mines
Commodity-Industry Analyst.
Washington
D. C.

Dear Mr. Griffith:

I am at present working up a flow sheet, to work the monazite beraing sands up around Knob Creek being the first flood plain in your letter to me of Feb. 10th. 1953.

What I would like to know, if possible, would it from your experience in this section, require a loog-washer?.

From what tests I made on the Marvin Hoyle bottom very little clay was present.

I would appreciate your opinion on the above problem.

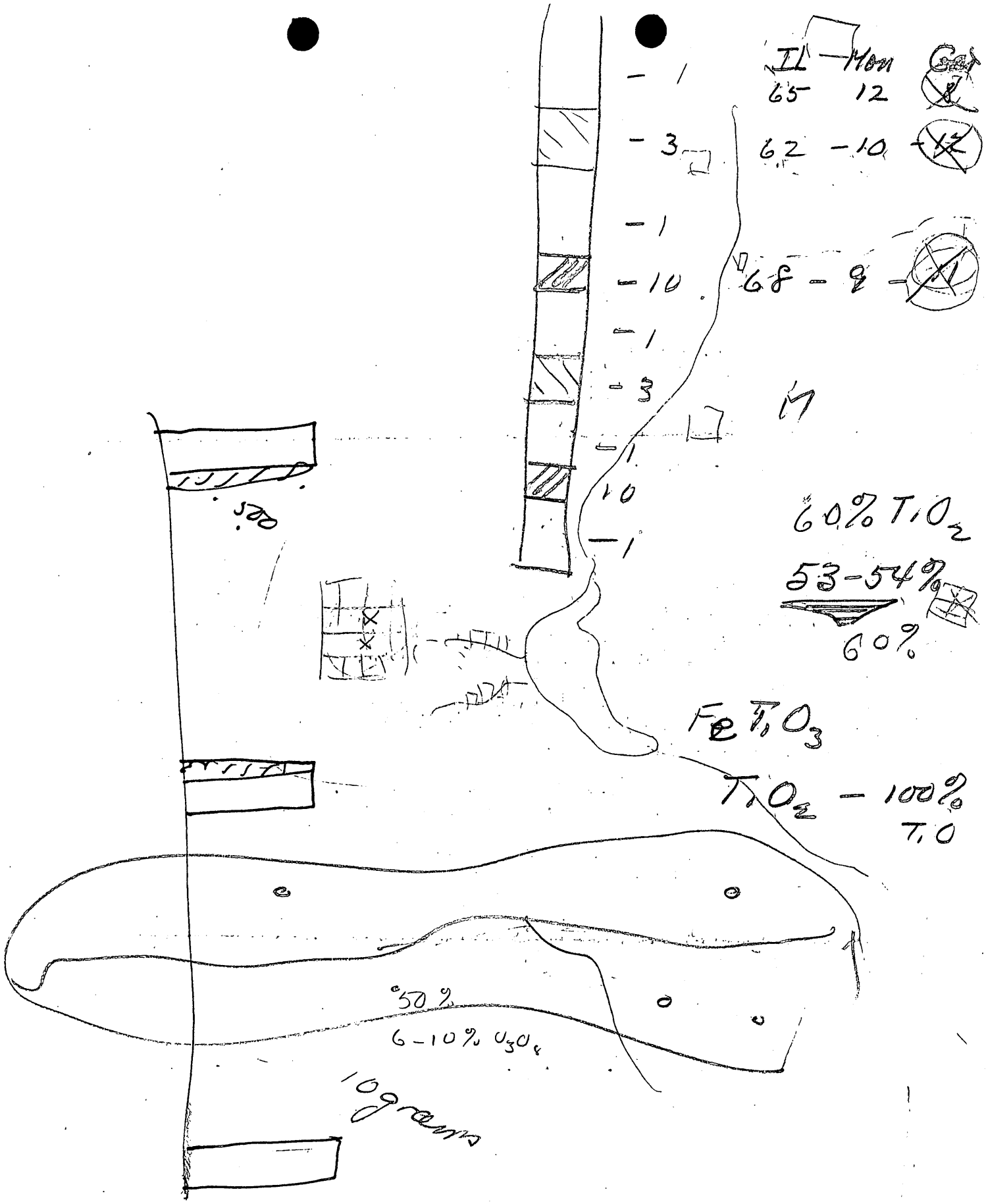
Golden Valley

This Monazite Mining Corp. is out of business, there concentrates contained only 2½ pounds of heavy minerals per yard, and the monazite is pratically non-existent.

Yours very truly

Bostoc rt. 2 N. C.

John A. Foy



MAY 10 2 48 PM '54
BUREAU OF MINES
WASHINGTON, D.C.

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

September 24, 1953

Mr. James A. Barr
505 Haylong Avenue
Mt. Pleasant, Tennessee

Dear Mr. Barr:

Your letter of September 21, 1953, in regard to monazite and heavy minerals in placers around Golden Valley, Rutherford County, N. C., has been received.

The Bureau of Mines, in cooperation with the Atomic Energy Commission has investigated by churn drilling some 30-odd placers in North and South Carolina. The reports on these placer deposits have been classified "RESTRICTED-SECURITY INFORMATION" by the AEC. None of these reports are available to the general public. However, the owners of all lands upon which the Bureau drilled are entitled to receive the factual data of all drilling conducted on their respective properties. To obtain this information they must write to the Bureau of Mines and request such data, as stated in paragraph 7 of the Agreement For Mineral Exploration that each owner has signed with the Government. The factual data will include a map of the property and will give the pertinent data as to size of area; depth of drill holes; pounds of heavy minerals per cubic yard of material; and the percent monazite, ilmenite, rutile, zircon, etc., contained in the heavy mineral sample concentrates. (Only a few owners to date have requested this factual data.)

The Bureau did not drill in Golden Valley, but some samples were concentrated from the area. The Bureau drilled placer deposits in several parts of Rutherford County which included: Sandy Run Creek, 2nd Broad River, Crane Creek, and Kathy Creek. Under present economic conditions, no placer deposit investigated by the Bureau in Rutherford Co., N. C., can be considered mineable. However, in nearby Cleveland County several deposits indicate about double the monazite content as those of Rutherford County. But, to date, the Bureau has not found a single placer deposit, of several million yards in size, in the southeastern states that contain as much as 3 pounds of monazite per cubic yard.

Some small placers, of tens of thousands to hundreds of thousands of yards of gravels, can be found in the narrow and shallow headwaters deposits of several streams and these placers may contain more than 3 pounds of monazite per cubic yard of material. Of these smaller placers examined by the Bureau, we do not know of any that could be profitably exploited at this time.

A large bucket-line dredge, handling 5,000 or more yards of gravel daily, can dig, wash, and concentrate the heavy minerals in a yard of alluvium at a cost of 10 to 15 cents per cubic yard. Magnetic separation of the heavy minerals would entail an additional cost of 3 to 5 cents per original yard of alluvium. A dry-land, tractor-mounted washing and concentration plant fed by a 3/4-yard tractor-mounted dragline can produce a heavy-mineral concentrate at a cost ranging between 25 and 40 cents per cubic yard of alluvium. Smaller operations such as a washing plant with power-shovel and truck haulage of gravel might raise the cost to as much as a dollar to produce the concentrates from a yard of material.

Besides the Lindsay Chemical Company, the following companies may be interested in purchasing monazite:

Rare Earths, Inc.
Box 433, R.D. No. 4
Paterson, N. J.

Mallinckrodt Chemical Works
3600 North 2nd Street
St. Louis 7, Mo.

Maywood Chemical Works
Maywood, N. J.

I hope this information will prove of some assistance to you.

Very truly yours,

E. J. Carlson,
Commodity-Industry Analyst
Rare and Precious Metals Branch

EJCarlson:hjy

Copy to: Minerals Division
Rare and Precious Metals Branch
✓E. J. Carlson
A. A. McKinney, Knoxville, Tenn.
E. W. Ellis-DMEA, Rm. 4640
R. F. Griffith, Rm. 3641
J. R. Thoenen, Acting Regional Director, Region VII, Knoxville, Tenn.
L. A. Hansen, Raleigh, N.C.
W.O. Files

FILE COPY
SURNAME: 913

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

SEP 21 1953

Mr. Duncan Sterling, Jr., Director
Monazite Mining Corporation
336 Hudson Street
Hackensack, N. J.

Re: Docket No. DMEA-3149 (Thorium)
Property near Golden Valley
Burke County, North Carolina

Dear Mr. Sterling:

Your application for aid in an exploration project docketed under the above number has been thoroughly reviewed by this Agency.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding material of acceptable grade, and in quantities that will improve the mineral supply position for National Defense.

A careful study of your proposal, together with all information available from other Government sources, reveals that the probability of disclosing thorium bearing minerals of acceptable grade by your proposed program is not sufficiently promising to justify Government participation. Under these circumstances, we regret that your application for exploration aid to the extent of 90 percent of $97,600.00 must be denied.

Your interest in the exploration program of the Defense Minerals Exploration Administration and your willingness to participate therein are appreciated.

Sincerely yours,

Frank E. Johnson (fw)

ACTING Administrator

EWEllis/gla/db
9-14-53
cc to: Adm. Reading File
Operating Committee
Docket
Messrs. H. D. Keiser, Rm. 3641
A. P. Butler, Jr., Rm. 3206, GSA
Ellis
DMEA Field Team, Region VIII (2)

R.C.G.
9-21-53

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

September 11, 1953

SUMMARY OF PROPOSED PROJECT

Docket No. DMEA-3149
Applicant: Monazite Mining Corporation
336 Hudson Street
Hackensack, N. J.

Subject: Denial of application without referral to Region for on-site examination.

Commodity: Thorium
Location of property: Near Golden Valley, Burke County, N. C. Region VII
Amount of application: $97,600.00
Date of application: August 13, 1953
Outline of project: Proposal to explore poorly identified area of stream gravels in the drainage of the Second Broad River by 200 churn drill holes and 30 test pits.

Commodity Members' Comments:

Bureau of Mines: E. J. Carlson, dated August 28, 1953

In view of insignificant amount of thorium, recommends the application be denied.

Geological Survey: D. M. Larrabee, dated August 31, 1953.

Recommends denial of application, one of five reasons given: "Material too low grade."

Arthur P. Butler, Jr., dated September 4, 1953.

From information already available and as the result of discussion with Mr. Carlson of the Bureau of Mines and Mr. J. O. Hosted of the Atomic Energy Commission, recommends that the application be denied without prior referral to the Field Team.

Comments of Rare & Misc. Metals Division engineer: Ernest Wm. Ellis:

Applicant estimates a recovery of 36 lbs. of concentrate from one cubic yard of gravel and furthermore states that said concentrate will

assay 10% in monazite or 3.6 lbs./cu.yd. of gravel. Applicant furthermore assumes the monazite recovered will average 3.9% ThO_2; thus, if these assumptions were proven correct, there would be produced only 0.1404 lbs. ThO_2 from each cubic yard of gravel. From knowledge previously obtained of the district, the Commodity Specialists believe the monazite recovery would not exceed 2 lbs. per cubic yard of gravel. Thus, in either case, the thorium recovery would be too small to be of any interest under the Defense Program even though thorium was required by the Atomic Energy Commission, a question still to be settled.

Recommend denial.

Ernest Wm. Ellis

Ernest Wm. Ellis

STANDARD FORM NO. 64

9/9/53 gla

Office Memorandum • UNITED STATES GOVERNMENT

TO : E. Wm Ellis, DMEA Member
Uranium Commodity Committee

DATE: Sept. 4, 1953

FROM : Arthur P. Butler, Jr., USGS Member
Uranium Commodity Committee

SUBJECT: Application, DMEA docket 3149 (thorium) Monazite Mining Corp., applicant, Hackensack, N. J., unspecified property near Golden Valley, N.C.

The application identified in the subject above has been reviewed and discussed with E. J. Carlson, Bureau of Mines member Monazite Commodity Committee, and J. O. Hosted, U. S. Atomic Energy Commission.

Proposal

The applicant proposes to explore poorly identified area of stream gravels in the drainage of the Second Broad River by 200 churn drill holes and 30 test pits at an estimated total cost of $97,600.

Comment

The applicant reports that a concentration test in their experimental plant gave an average recovery of 1.6 lbs. of monazite per cubic yard. They estimate that by better mining, and improved separation techniques this could be raised to 3.6 pounds per yard. The Geological Survey has made detailed studies of parts of the monazite-bearing placer areas in North Carolina and the Bureau of Mines has explored parts of the drainage basin above and below the area that the applicant proposes to explore. Although complete results of these investigations have not been formally reported, Mr. Carlson has advised me orally that the results obtained in the Bureau Mines' exploration indicate that quantities of monazite likely to be found in tracts big enough for large-scale operations are too insignificant to warrant comprehensive exploration with the hope of outlining a deposit of commercial grade. Geological Survey geologists who have worked in the area estimate that gravel deposits of more than 1,000,000 cubic yards in volume are unlikely to contain more than 1 to 2 lbs. of monazite per cubic yard.

Recommendation

In view of the information already available and as the result of the discussion with Mr. Carlson, I recommend that the application be denied without prior referral to the Field Team.

Arthur P. Butler, Jr.

IN REPLY REFER TO:

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

Sept. 4, 1953

E. Wm Ellis, DMEA Member
Uranium Commodity Committee
Arthur P. Butler, Jr., USGS Member
Uranium Commodity Committee
Application, DMEA docket 3149 (thorium) Monazite Mining Corp., applicant, Hackensack, N. J., unspecified property near Golden Valley, N.C.

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Recommendation

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9/9/53 gla

IN REPLY REFER TO:
G-MD-CNM

RECEIVED
SEP 1953

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

August 31, 1953

Memorandum

REVIEW OF APPLICATION DMEA-3149 (Thorium)

To: E. William Ellis, Defense Minerals Exploration Administration
From: D. M. Larrabee, U. S. Geological Survey
Applicant's name and address: Monazite Mining Corporation, Hackensack, New Jersey.
Name of property: No name.
Location of property: Near Golden Valley, North Carolina.
Summary of applicant's proposal:

200 drill holes
30 sampling shafts
Buildings
Sample testing
$97,600

Sources of information on applicant's property: None.
Comments:

1. Material too low grade.
2. No map or sketch showing location of proposed workings.
3. Exorbitant cost estimates.
4. Sampling plan too extensive.
5. Sampling plan too hazy.

RECOMMENDATION: Denial.

D. M. Larrabee

D. M. Larrabee

IN REPLY REFER TO:

G-D-CNM

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

August 31, 1953

Memorandum

REVIEW OF APPLICATION DMEA-3149 (Thorium)

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Sources of information on applicant's property: None.
Comments:

1. Material too low grade.
2. No map or sketch showing location of proposed workings.
3. Exorbitant cost estimates.
4. Sampling plan too extensive.
5. Sampling plan too hazy.

RECOMMENDATION: Denial.

D. M. Larrabee

Larrabee:jeh
8/31/53
cc: Director's reading 4212
Branch reading 4212
DMEA 3
Larrabee G-230

IN REPLY REFER TO:

G-MD-CN

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

August 31, 1953

Memorandum

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3. Exorbitant cost estimates.
4. Sampling plan too extensive.
5. Sampling plan too hazy.

RECOMMENDATION: Denial.

D. M. Larrabee

Larrabee:jeh
8/31/53
cc: Director's reading 4212
Branch reading 4212
DMEA 3
Larrabee G-230

IN REPLY REFER TO:

G-RL-CRY

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

August 31, 1953

Memorandum

REVIEW OF APPLICATION DMEA-3149 (Thorium)

To: E. William Ellis, Defense Minerals Exploration Administration
From: D. M. Larrabee, U. S. Geological Survey
Applicant's name and address: Monazite Mining Corporation, Hackensack, New Jersey.
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Location of property: Near Golden Valley, North Carolina.
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200 drill holes
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Buildings
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$97,600

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Comments:

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2. No map or sketch showing location of proposed workings.
3. Exorbitant cost estimates.
4. Sampling plan too extensive.
5. Sampling plan too hazy.

RECOMMENDATION: Denial.

D. M. Larrabee

larrabee:jeh
8/31/53
cc: Director's reading 4212
Branch reading 4212
DMEA 3
Larrabee G-230

8/28/53 gla

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

August 28, 1953

Memorandum

To: Ernest Wm. Ellis, Chief, Rare and Misc. Metals Division, D. M. E. A.

From: E. J. Carlson, Commodity-Industry Analyst, Rare and Precious Metals Branch

Subject: Docket No. DMEA-3149, application of the Monazite Mining Corporation to explore for thorium (monazite) in Golden Valley, North Carolina

The subject application has been reviewed by this office. The following comments are offered for your consideration:

1. The quoted thorium content of Golden Valley monazite is merely an average of analyses made many years ago from lots of monazite taken from several counties of North Carolina. There is no substantiating documentary evidence that the monazite of Golden Valley has been analyzed and what the thorium content may be of such monazite.

2. The Bureau of Mines, during 1951 and 1952, drilled placer deposits on all sides of Golden Valley including the 1st Broad River which drains Golden Valley. The areas drilled included: Cane Creek, Silver Creek, 1st Broad River and tributaries, and 2nd Broad River and tributaries. None of these named deposits indicated as much as 1.0 pound of monazite per cubic yard of gravels. No Bureau drilling was done in the small basins that comprise what is known as Golden Valley.

3. The Vice President of the Monazite Mining Corp., Mr. Wallace Minto, brought a number of rough spiral concentrates from their Golden Valley plant to the Bureau of Mines concentration laboratory at Shelby, N. C., early in 1952. The Bureau employees assisted Mr. Minto by cleaning this material on shaking tables to produce clean black-sand concentrates. Bureau employees estimated this final concentrate would run only 2 to 3 percent monazite. (Bureau estimates of the black-sand concentrates---which were later confirmed by chemical, radiometric, and petrographic analyses at Raleigh, N. C. laboratories---of areas surrounding Golden Valley averaged from 4 to 6 percent monazite.

Using the 13 pounds per cubic yard of bulk black sands, the figure submitted by the applicant, and using the Bureau's maximum

estimate of 3 percent monazite content for Golden Valley concentrates which they cleaned up, this would indicate a monazite content of 0.39 pounds per cubic yard of material. If such monazite ran as high as 5 percent thorium, then the thorium content would be only 0.0195 pounds per cubic yard. The alluvium, considering 2700 pounds as a fair weight for the material, would then contain 0.0007 percent thorium.

In view of this insignificant amount of thorium, it is recommended that the application be denied.

E. J. Carlson

E. J. Carlson

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

August 28, 1953

Memorandum

To: Ernest Wm. Ellis, Chief, Rare and Misc. Metals Division, D. M. E. A.

From: E. J. Carlson, Commodity-Industry Analyst, Rare and Precious Metals Branch

Subject: Docket No. DMEA-3149, application of the Monazite Mining Corporation to explore for thorium (monazite) in Golden Valley, North Carolina

The subject application has been reviewed by this office. The following comments are offered for your consideration:

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L. J. Carlson

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

August 28, 1953

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From: E. J. Carlson, Commodity-Industry Analyst, Rare and Precious Metals Branch

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E. J. Carlson

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

Defense Minerals Administration
RECEIVED
AUG 28 1953

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. DMEA-3149
Metal or Mineral
Date Received 8-28-53
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Monazite Mining Corporation * Caesar Del'lora, President
336 Hudson Street Patricia J. Coffey, Secy.
Hackensack, N.J. John H. Beer, Treasurer

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers. See above *

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract See attached statement

(*b*) State any mine name by which the property is known.

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. See attached report

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

*** Richard M. Atwater, Jr.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore See attached report

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc.

(*c*) The work will start within 30 days and be completed within 12 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See attached report ***

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project: See report

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.). See report - None

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants. See Report

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel. See report

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be. See report

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project. See report

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project. See report

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes. See report

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)? Yes

(*b*) How do you propose to furnish your share of the costs?

[X] Money [ ] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated August 13, 1953

Monazite Mining Corporation
(Applicant)

By Duncan Sterling, Jr., Director

Duncan Sterling Jr

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—66551-1

Leases and/or options on approximately 1,000 additional acres of gravel containing "bottom" are in course of negotiation. All of them are within truck-haul distance of the company's mill and establishment. These options will take two to three months to complete.

M M Corp.

Application for D.M.E.A. "Aid"

Rough Estimate of Program

Allow for 200 Drill Holes - 12' to 25' deep - 8" Casing

Each hole - moving in and set up	- $30.	
" " - 1 day drilling	- 50.	$ 80.00
Panners & Samples - Handling		30.00
	per hole	$ 110.00
200 holes		22,000.00
Purchase of Drill tools & Truck		18,000.00
		$40,000.00

Sampling

Rehabilitation & Purchase of Test Mill	
Purchase of building, etc.	10,000.00
New Sampling unit	15,000.00
Truck for moving samples	2,000.00
	$27,000.00

Handling Samples from 200 holes

Labor - 2 men, 200 days @ $10	4,000.00
Carpco - Separation of samples 200 @ $20.	4,000.00
	$ 8,000.00

Overhead

Supervising Engineer - say 100 dys @ $50	5,000.00
Traveling Expense - 6 trips @ $200.	1,200.00
Board & Lodging - 100 days @ $10	1,000.00
Office Staff - bookkeeping -Audit, etc.	2,000.00
Car and upkeep	2,500.00
	$11,600.00

Forward $86,600

Shafts

Allow for 30 shafts 4x7' (28 cft. 1 cyd) 20 ft. average depth to be dug by hand, pick and shovel with 1/2 cu. yd. dragline to hoist out the muck, and well-point of pump drainage.

2 days each digging

3 days pumping

Forward		$86,600.
EachShaft - labor 3 men, 2 days @ $10	$ 60.00	
Rent of drag-line, 2 days @ $50	100.00	
Handling drainage - 1 man, 3 days & pump	40.00	
Total	$ 200.00	

Sampling

Average "Muck" 20 cyds.

Cost of trucking to Test Mill	$ 20.00
Cost of washing Concentrate	40.00
Cost of processing concentrate	40.00
	$ 100.00

Each Shaft.....$300.00

30 Shafts..... $ 9,000.00

Equipment - Hire of drag-line - see above

Truck (hire of) " "	
Well point & Pump	1,500.00
Panel Timbering Removable	200.00
Tools	300.00
	$ 2,000.00

Total 11,000.

Grand Total - $97,600. - call it $100,000.

MONAZITE MINING CORPORATION

Introductory

Proposed application for D.M.E.A. "Aid"

1) "Aid" is limited to "Exploration for ... undeveloped sources of strategic or critical metals and minerals"

2) THORIUM is the mineral in this case. It occurs as a component part of the "Monazite Sand" present in all of the Golden Valley "bottoms", J. Hyde Pratt, in his Report-Bulletin No. 25, North Carolina Geological & Economic Survey, states that Monazite Sands are contained in "pegmatized stream placers in Rutherford, Burke, McDowell and Caldwell Counties - North Carolina - all of which are within a radius of 25 miles of the Mill, and establishment of M. M. Corporation at Golden Valley.

Hyde gives the Thorium content of Burke County Monazite Sand as 6.40% TH O_2. He further says: - "The majority contain from 3 to 9% of this oxide." He further gives actual analyses for 10 different commercial lots from the above counties.

2.15%	1.27%	6.26%
2.25%	6.30%	3.98%
6.54%	2.48%	1.93%
	5.87%	

(Average - 3.90%)

3) Monazite Sand Production

Monazite Sand was produced on a commercial Scale, from 1893 to 1910 in substantial quantities, mostly from hand washing operations. The total production during those years is given (by Hyde Pratt) as 9,775,590 lbs. (the use, then was for Welsbach lamp mantles), which - at the 3.90% average content of Thorium, contained roughly 380,000 lbs. of Th. O_2.

As far as can be ascertained most of this production came from small stream-beds, where hand work was practicable.

4) The Monazite Mining Corporation has established the first modern-style, mechanized major-scale operation for Thorium production in North Carolina.

Having selected a centrally located "Bottom" on the second Broad River, close to State Highway #26, near Golden Valley School house, the company purchased outright in 1952 some 58 acres of land comprising an excellent hillside mill-site together with an acreage of "bottom" land containing several hundred thousand cubic yards of "pegmatitic stream placer" gravel.

Commencing operations in Feb. 1953, the Corporation carried out a "test run", lasting until mid-May. A total of 34,153 cubic yards of "bottom" gravel (a mixture of sand, gravel, clay and water-worn cobbles) was dug up, truck-transported to the hill-side Mill and treated, on screens, classifier, Humphreys Spirals and Wilfley Tables. The product bulk concentrate - after Kiln drying weighed 222 tons (partly estimated), equivalent to a recovery of 13 lbs. per cubic yard.

A bulk sample of this concentrate was taken to the CARPCO Laboratory in Jacksonville, Fla. where a test run showed its composition to be:

Ilmenite	35.5%	
Rutile	10.1%	
Zircon	12.1%	
Garnet	20.0%	
Monazite	10.0%	
Kyanite	4.0%	
Sillimanite	2.5%	
Gangue	5.8%	100%

(also considerable gold and mica (biotite)

Mill operation was then suspended to allow for completion of the "Dry Processing Unit" planned to separate - by magnetic, electrostatic, etc. - equipment the bulk concentrate into its component parts, to be followed by chemical separation of the thorium.

However, the "test-run" disclosed the need for several improvements in the mill treatment to remedy losses of values; these are: -

8 1) Better screening - considerable minus 16 mesh material failing to pass through the 16 mesh screen.

2) Considerable value - Monazite, garnet and gold - in the 16 mesh oversize portion - calling for Jig treatment.

3) Losses of Monazite and other values in the classifier overflow - calling for Allen Cones.

4) Losses of Monazite and other values in the Spiral Cleaner Tailings and the final table tailings, calling for return of same to the classifier.

Steps are being taken to remedy these faults.

Besides incomplete mill recovery of the values in the material treated, it was found that the drag-line digging up the gravel from the "bottom" had not been able to reach the lower layer of alluvial material, leaving some 3-4 ft. on the "bed-rock" which - according to placer-mining standards, - should be the best "pay". This was confirmed by pan tests.

The above conditions have been used as the basis for the following estimate of what can be expected after the faulty features have been remedied.

Assuming the "test-run" mill recovery to have been only 60% of the contents, then the actual average content would be 21.66 lbs.

Assuming that the bottom layer of gravel which the drag-line operator was unable to reach (too short a boom) carries as much value as the upper portion which was dug, the complete digging would show 43.33 lbs. of "contents", allow for a mill recovery of 85% after the faults in the treatment are remedied - the yield of "bulk concentrate" should then be 36.63 lbs. on the basis of a 36 lb. per cubic yard recovery of bulk concentrate, the contents would figure out, as follows: -

From each 36 lbs. of bulk concentrate - with the CARPCO test - there would be:

Ilmenite	35.5%	12.780 lbs. per cu. yard
Rutile	10.1%	3.636 "
Zircon	12.1%	4.356 "
Garnet	20.0%	7.200 "
Monazite	10.0%	3.600 "
Kyanite	4.0%	1.440 "
Sillimanite	2.5%	0.900 "
Gangue	5.8%	2.088 "
	100.0%	36.000 "

which translated into a ton of bulk concentrate shows the following content and market values:

Ilmenite	720 lbs.	@ 2¢	$ 14.00
Rutile	202 "	@ 4¢	8.08
Zircon	242 "	@ 3¢	7.26
Garnet	400 "	@ 5.5¢	22.00
Monazite Sand	200 "	@ 30¢	40.00
Kyanite	80 "	@ 1.5¢	1.30
Sillimanite	50 "	@ 1.5¢	.75
Gangue	116 "	nil	nil
	2000 lbs.		$93.29

Extending a market value to the 18 tons to be recovered (36 lbs. rate) from 1,000 cubic yards (the mills present capacity) of average "mill-feed" if: -

18 x $93.29.....$1,679.29 daily gross

(without any allowance for the gold recovery or for receipts from sale of sand, gravel and crushed rock - intended by-products)

However, since Thorium is the subject of this application, we can only take the Hyde Pratt average of 3.9% as the basis for the expected recovery of the element.

Each 1,000 cubic yards of average "bottom" gravel is expected to yield 18 tons of bulk concentrate.

Each ton of bulk concentrate on the Carpco test figures will contain 200 lbs. of Monazite sand.

200 lbs. of Monazite Sand @ 3.9% will carry 7.8 lbs. of TH O_2.

Each 1,000 cubic yards of average bottom gravel, yielding 18 tons of bulk concentrate, should provide (18x7.8) = 140.4 lbs. of TH O_2 - the daily production.

The Monazite Mining Corp. Golden Valley Mill with its proven capacity of 1,000 cubic yards per 24 hrs. should, therefore, be able to produce: -

300 x 140.4 = 42.120 lbs. of TH O_2 yearly.

Mill-run tests made at the Golden Valley Mill show that all of the values are carried on the finer portion of the sand and gravel - probably all of the values will pass through a 12 mesh screen.

Further tests show that around 40% - 45% of the average "mill-feed" from "bottom" gravel, passes through a 12 mesh screen.

This feature is of major importance in the company's plans for expansion of Thorium production. These plans contemplate digging up gravel, at several other "bottoms" in the Golden Valley area, rough-washing the gravel with semi-portable wet screening units (standard gravel washing equipment) at the digging site and sending only the minus 12 mesh-portion, by truck, to the company's Golden Valley Mill, where the recovery of the contained values will be carried out.

That will facilitate operation, since only the minus 12 mesh material will have to be handled at the established mill. The rough washing and screening can be done with standard equipment of semi-portable type, but the final treatment with classified jigs, spirals and tables must be carried out by stationary equipment. The Corporation proposes to increase the capacity for treating minus 12 mesh mill-feed as fast as the accessory, semi-portable digging and roughing, units can supply the mill-feed.

However, before commencing production along that line it is necessary to measure and test the gravel in the several "bottoms" nearby.

Several of these already have been given some testing, but much more thorough and comprehensive work is called for.

It is pertinent to note that 7 of the "bottoms" where such testing is contemplated are up-stream gravel-beds in the Second Broad River from which the "test-run" described above was made (from the "Hunt" Ground). They contain several million cubic yards.

Also, downstream, below the digging described in the "test-run" are extensions of "bottoms" in the same river, which contain several million of cubic yards additional.

The largest "bottom" contemplated in the Corporation's plan is not a product of the Second Broad River flow, although it empties into that stream. This separate "bottom" (known as "South Creek") has two "feeder" streams of considerable size from which test samples show value: Sampling of the South Creek "bottom" itself, showed excellent values - but more testing is necessary.

Altogether the "bottoms" immediately accessible to the Corporation's Golden Valley Mill show - roughly - over 10,000,000 cubic yards of gravel. It is fairly safe to assume the recovery of Thorium will average - at least - up to that from the "test-run" so that the prospect for Thorium recovery looks like a possible total of over 1,400,000 lbs. of $TH\ O_2$ - in the course of time - depending upon the scale or production. 7

It should be kept in mind also, that while the Corporation's plans for increased production include only the near-by "bottoms", there are a large number of them further distant, which may become productive following the Corporation's example.

ADDENDA

It has been established by hand washing tests that the pegmatite dikes - as well as their erosion gravel beds - in the Spruce Pine areas of North Carolina carry Columbite and Tantalite as well as the minerals found in the South Mountain areas. Auerlite carrying 10.13% $TH\ O_2$ also occurs in Henderson County as well as pitch blende, at Flat Rock Mine in Spruce Pine Hills. Arrangements already have been initiated to have bulk concentrates - and, even, the minus 12 mesh washings from their sources brought to the Monazite company's plant for complete recovery and dry processing.

To enable the building up of sufficient "through-put" at the Company's plant to allow commercial operation it seems desirable to extend the sources of supply as far as the distance factors permit. The campaign of testing near-by "bottoms" with drill holes and test shafts is the first step in this direction.

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

August 28, 1953

Monazite Mining Corporation
336 Hudson Street
Hackensack, New Jersey

Subject: DMEA-3149
Re: Exploration Assistance

My dear Mr. Sterling:

The receipt of your application dated August 13, 1953 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-3149 and referred to the Rare and Miscellaneous Metals Division.

Kindly refer to DMEA-3149 in any future correspondence relating to your application.

Sincerely yours,

ROBERT E. ADAMS

Robert E. Adams
Chief, Operations Control and
Statistics Division

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

Defense Minerals Administration
RECEIVED
AUG 28 1953

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. DMEA - 3149
Metal or Mineral
Date Received 8-28-53
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Monazite Mining Corporation * Caesar De Flora, President
336 Hudson Street Patricia J. Coffey, Secretary
Hackensack, N. J. John H. Beer, Treasurer

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers. See above *

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract See attached statement

(*b*) State any mine name by which the property is known.

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. See attached report.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

*** Richard M. Atwater, Jr.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you will to explore See attached report

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc.

(*c*) The work will start within 30 days and be completed within 12 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See attached report ***

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.). See report — None

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel. See report

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be. See report

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project. See report

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project. See report

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes. See report

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)? Yes

(*b*) How do you propose to furnish your share of the costs?

[X] Money [ ] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated August 13, 1953.

Monazite Mining Corporation
(Applicant)

By Duncan Sterling Jr.
Duncan Sterling, Jr., Director

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—66551-1

Leases and/or options on approximately 1,000 additional acres of gravel containing "bottoms" are in course of negotiation. All of them are within truck-haul distance of the company's mill and establishment.

Wm. Atwater, Jr.

Duncan Lindsay Jr

M M Corpn.

Application for D.M.E.A. "Aid"

Rough Estimate of Program

Allow for 200 Drill Holes - 12' to 25' deep - 8" Casing

Each hole - moving in and set up	- $30.	
" " 1 day drilling	- 50.	$80.00
Panners & Samples - Handling per hole		30.00
		$110.00
200 holes		22,000.00
Purchase of Drill tools & Truck		18,000.00
		$ 40,000.00

Sampling

Rehabilitation & Purchase of Test Mill

Purchase of building,etc.	10,000.00
New Sampling unit	15,000.00
Truck for moving samples	2,000.00
	27,000.00

Handling Samples from 200 holes

Labor - 2 men, 200 days @ $10	4,000.00
Carpco - Separation of samples 200 @ $20.	4,000.00
	$ 8,000.00

Overhead

Supervising Engineer - say 100 dys. @$50	5,000.00
Traveling Expense - 6 trips @ $200.	1,200.00
Board & Lodging - 100 days @ $10	1,000.00
Office Staff -bookkeeping-Audit,etc.	2,000.00
Car and upkeep	2,500.00
	$11,600.00

Forward $86,600.

Shafts

Allow for 30 shafts 4x7' (28 cft= 1 cyd) 20 ft. average depth to be dug by hand, pick and shovel with 1/2 cu. yd. dragline to hoist out the muck, and well-point of pump drainage.

2 days each digging

3 days pumping

FWD. $86,600.

Each Shaft - Labor 3 men, 2 days @ $10	$ 60.00
Rent of drag-line, 2 days @ $50	100.00
Handling drainage - 1 man, 3 days & pump	40.00
Total	$ 200.00

Sampling

Average "Muck" 20 cyds.

Cost of trucking to Test Mill	20.00
Cost of Washing Concentrate	40.00
Cost of processing concentrate	40.00
	$ 100.00

Each Shaft.....$300.00

30 Shafts..... $9,000.00

Equipment Hire of drag-line -- see above

Truck (hire of) ---- see above

Well point & Pump	1,500.00
Panel Timbering Removable	200.00
Tools	300.00
	2,000.00
Total	$ 11,000.

Grand Total -- $97,600. -- call it 100,000.

R.M. Atwater, Jr.

MONAZITE MINING CORPORATION

Introductory

Proposed application for D.M.E.A. "Aid"

1) "Aid" is limited to "Exploration for ... undeveloped sources of strategic or critical metals and minerals"

2) THORIUM is the mineral in this case. It occurs as a component part of the "Monazite Sand" present in all of the Golden Valley "bottoms", J. Hyde Pratt, in his Report-Bulletin No. 25, North Carolina Geological & Economic Survey, states that Monazite Sands are contained in "pegmatized stream placers in Rutherford, Burke, McDowell and Caldwell Counties - North Carolina - all of which are within a radius of 25 miles of the Mill, and establishment of M. M. Corporation at Golden Valley.

Hyde gives the Thorium content of Burke County Monazite Sand as 6.40% ThO_2. He further says: - "The majority contain from 3 to 9% of this oxide. He further gives actual analyses for 10 different commercial lots from the above counties.

2.15%	1.27%	6.26%
2.25%	6.30%	3.98%
6.54%	2.48%	1.93%
	5.87%	

(Average - 3.90%)

3) Monazite Sand Production

Monazite Sand was produced on a commercial scale, from 1893 to 1910 in substantial quantities, mostly from hand washing operations. The total production during those years is given (by Hyde Pratt) as 9,775,590 lbs. (the use, then was for Welsbach lamp mantles), which - at the 3.90% average content of Thorium, contained roughly 380,000 lbs. of Th. O_2.

As far as can be ascertained most of this production came from small stream-beds, where hand work was practicable.

4) The Monazite Mining Corporation has established the first modern-style, mechanized major-scale operation for Thorium production in North Carolina.

Having selected a centrally located "Bottom" on the second Broad River, close to State High-way #26, near Golden Valley School house, the company purchased outright in 1952 some 58 acres of land comprising an excellent hillside mill-site together with an acreage of "bottom" land containing several hundred thousand cubic yards of "pegmatitic stream placer" gravel.

Commencing operations in Feb, 1953, the Corporation carried out a "test run", lasting until mid-May. A total of 34,153 cubic yards of "bottom" gravel (a mixture of sand, gravel, clay and water-worn cobbles) was dug up, truck-transported to the hill-side Mill and treated, on screens, classifier, Humphreys Spirals and Wilfley Tables. The product bulk concentrate - after Kiln drying weighed 222 tons (partly estimated), equivalent to a recovery of 13 lbs. per cubic yard.

A bulk sample of this concentrate was taken to the CARPCO Laboratory in Jacksonville, Fla. where a test run showed its composition to be:

Ilmenite	35.5%	
Rutile	10.1%	
Zircon	12.1%	
Garnet	20.0%	
Monazite	10.0%	
Kyanite	4.0%	
Sillimanite	2.5%	
Gangue	5.8%	100%

(also considerable gold and mica (biotite))

Mill operation was then suspended to allow for completion of the "Dry Processing Unit" planned to separate - by magnetic, electrostatic, etc. - equipment the bulk concentrate into its component parts, to be followed by chemical separation of the thorium.

However, the "test-run" disclosed the need for several improvements in the mill treatment to remedy losses of values: these are: -

1) Better screening - considerable minus 16 mesh material failing to pass through the 16 mesh screen

2) Considerable value - Monazite, garnet and gold - in the 16 mesh oversize portion - calling for Jig treatment

3) Losses of Monazite and other values in the classifier overflow - calling for Allen Cones.

4) Losses of Monazite and other values in the Spiral Cleaner Tailings and the final table tailings, calling for return of same to the classifier.

Steps are being taken to remedy these faults.

Besides incomplete mill recovery of the values in the material treated it was found that the drag-line digging up the gravel from the "bottom" had not been able to reach the lower layer of alluvial material, leaving some 3-4 ft. on the "bed-rock" which - according to placer-mining standards, - should be the best "pay". This was confirmed by pan tests.

The above conditions have been used as the basis for the following estimate of what can be expected after the faulty features have been remedied.

Assuming the "test-run" mill recovery to have been only 60% of the contents, then the actual average content would be 21.66 lbs.

Assuming that the bottom layer of gravel which the drag-line operator was unable to reach (too short a boom) carries as much value as the upper portion which was dug, the complete digging would show 43.33 lbs. of "contents", allow for a mill recovery of 85% after the faults in the treatment are remedied - the yield of "bulk concentrate" should then be 36.63 lbs. on the basis of a 36 lb. per cubic yard recovery of bulk concentrate, the contents would figure out, as follows: -

From each 36 lbs. of bulk concentrate - with the CARPCO test - there would be:

Ilmenite	35.5%	12.780 lbs. per cu. yard
Rutile	10.1%	3.636 "
Zircon	12.1%	4.356 "
Garnet	20.0%	7.200 "
Monazite	10.0%	3.600 "
Kyanite	4.0%	1.440 "
Sillimanite	2.5%	0.900 "
Gangue	5.8%	2.088 "
	100.0%	36.000 "

Need more evidence to prove each figure

2-3%

which translated into a ton of bulk concentrate shows the following content and market values:

Ilmenite	720 lbs.	@ 2¢	$ 14.00
Rutile	202 "	@ 4¢	8.08
Zircon	242 "	@ 3¢	7.26
Garnet	400 "	@ 5.5¢	22.00
Monazite Sand	200 "	@ 30¢ ?	40.00
Kyanite	80 "	@ 1.5¢	1.30
Sillimanite	50 "	@ 1.5¢	.75
Gangue	116 "	nil	nil
	2000 lbs.		$ 93.29

$1.679/cu. yd. ?

Extending a market value to the 18 tons to be recovered (@ 36 lbs. rate) from 1,000 cubic yards (the mills present capacity) of average "mill-feed" if: -

18 x $93.29.....$1,679.29 daily gross

(without any allowance for the gold recovery or for receipts from sale of sand, gravel and crushed rock - intended by-products)

However, since Thorium is the subject of this application, we can only take the Hyde Pratt average of 3.9% as the basis for the expected recovery of the element.

Each 1,000 cubic yards of average "bottom" gravel is expected to yield 18 tons of bulk concentrate.

Each ton of bulk concentrate on the Carpco test figures will contain 200 lbs. of Monazite sand.

200 lbs. of Monazite Sand @ 3.9% will carry 7.8 lbs. of TH. O_2.

Each 1,000 cubic yards of average bottom gravel, yielding 18 tons of bulk concentrate, should provide (18x7.8) = 140.4 lbs. of $TH.O_2$ - the daily production

The Monazite Mining Corp. Golden Valley Mill with its proven capacity of 1,000 cubic yards per 24 hrs. should, therefore, be able to produce: -

300 x 140.4 = 42.120 lbs. of $TH.O_2$ yearly.

Mill-run tests made at the Golden Valley Mill show that all of the values are carried on the finer portion of the sand and gravel - probably all of the values will pass through a 12 mesh screen.

Further tests show that around 40% - 45% of the average "mill-feed" from "bottom" gravel, passes through a 12 mesh screen.

This feature is of major importance in the company's plans for expansion of Thorium. production. These plans contemplate digging up gravel, at several other "bottoms" in the Golden Valley area, rough-washing the gravel with semi-portable wet screening units (standard gravel washing equipment) at the digging site and sending only the minus 12 mesh-portion, by truck, to the company's Golden Valley Mill, where the recovery of the contained values will be carried out.

That will facilitate operation, since only the minus 12 mesh material will have to be handled at the established mill. The rough washing and screening can be done with standard equipment of semi-portable type, but the final treatment with classified jigs, spirals and tables must be carried out by stationary equipment. The Corporation proposes to increase the capacity for treating minus 12 mesh mill-feed as fast as the accessory, semi-portable digging and roughing units can supply the mill-feed.

However, before commencing production along that line it is necessary to measure and test the gravel in the several "bottoms" nearby.

Several of these already have been given some testing, but much more thorogh and comprehensive work is called for.

It is pertinent to note that 7 of the "bottoms" where such testing is contemplated are up-stream gravel-beds in the Second Broad River from which the "test-run" described above was made (from the "Hunt" Ground). They contain several million cubic yards.

Also, downstream, below the digging described in the "test-run" are extensions of "bottoms" in the same river, which contain several million of cubic yards additional.

The largest "bottom" contemplated in the Corporation's plan is not a product of the Second Broad River flow, although it empties into that stream. This separate "bottom" (known as "South Creek") has two "feeder" streams of considerable size from which test samples show value: Sampling of the South Creek "bottom" itself, showed excellent values - but more testing is necessary.

Altogether the "bottoms" immediately accessible to the Corporations' Golden Valley Mill show - roughly - over 10,000,000 cubic yards of gravel. It is fairly safe to assume the recovery of Thorium will average - at least - up to that from the "test-run" so that the prospect for Thorium recovery looks like a possible total of over 1,400,000 lbs. of $TH.O_2$. - in the course of time - depending upon the scale or production.

It should be kept in mind also, that while the Corporation's plans for increased production include only the near-by "bottoms", there are a large number of them further distant, which may become productive following the Corporation's example.

ADDENDA

It has been established by hand washing tests that the pegmatite dikes - as well as their erosion gravel beds - in the Spruce Pine areas of North Carolina carry Columbite and Tantalite as well as the minerals found in the South Mountain areas. Auerlite carrying 10.13% $TH.O_2$ also occurs in Henderson County as well as pitch blende. At Flat Rock Mine in Spruce Pine Hills, arrangements already have been initiated to have bulk concentrates - and, even, the minus 12 mesh washings from their sources brought to the Monazite company's plant for complete recovery and dry processing.

To enable the building up of sufficient "through-put" at the Company's plant to allow commercial operation it seems desirable to extend the sources of supply as far as the distance factors permit. The campaign of testing near-by "bottoms" with drill holes and test shafts is the first step in this direction.

Ben Atwater, Jr.