DMA Form 1

DEFENSE MINERALS ADMINISTRATION
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Exploration Project

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Routing Slip Cys. to USGS, BM

To:	700	Date	5/23/56
To:	Oper. Com	Date	6-5-56
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To:	J.E. Johnson	Date	6-7-56
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To:	Oper. Com.	Date	9-24-56
To:	J.E. Johnson	Date	9-24-56
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700

Ching
Ellis
Kilgaard
Lamb
Eldridge
Fleisman

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

SEP 25 1956

Mr. Harold Raymond
15 Oakmont Drive
Los Angeles 49, California

Re: Docket No. DMEA-4303 (Uranium)
State Leases Nos. Min-505 and Min-511
Pima County, Arizona

Dear Mr. Raymond:

Your application for aid in an exploration project and other information available to us in Washington concerning your above-named property have been reviewed.

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

Careful study of all our information, although noting a small amount of uranium mineralization on your property, indicates that the probability of disclosing significant ore reserves is not sufficiently promising to justify Government participation. We regret to advise you that, under these circumstances, your application for exploration assistance is denied.

We wish to thank you for your interest in the Defense Minerals Exploration Program and for bringing your property to our attention.

Sincerely yours,

U. O. Mittendorf
Administrator

MChing/gla
9-24-56
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. JECrawford, 3643
THKiilsgaard, 5224
JOHosted, 3210, GSA
Code 700
Mr. Ching
DMEA Field Team, Region III (2)

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

DOCKET COPY

Ching
Ellis

September 24, 1956

Summary of Proposed Project

Object: Denial of application for an exploration project.

Docket No.: DMEA-4303

Commodity: Uranium

Applicant: Harold Raymond
15 Oakmont Drive
Los Angeles 49, California

Property: Arizona State Leases Nos. MIN-505 and MIN-511 comprising Red Hills Nos. 1-8 claims, and Red Hills Nos. 9-10 and Blue No. 3 claims, respectively, situated in secs. 5 and 6, T. 16 S., R. 17 E., Pima County, Arizona. Applicant holds a 60% interest in above leases and has operating agreement with the holders of the remaining 40% interest.

Date of Application: April 20, 1956

Amount of Application: $7,100.00

Work Proposed:

40 hrs. bulldozer trenching across anomalies	$ 500.00
350 ft. diamond drilling @ $5.00/ft. (2 holes)	1,750.00
1,075 ft. wagon drilling @ $2.00/ft.	2,150.00
Supervision and technical services	1,750.00
Miscellaneous expenses	950.00
Total	$7,100.00
Government participation @ 75%	$5,325.00

Field Team Report, August 31, 1956, John N. Faick, USGS.

Silicified brecciated limestones are exposed on the property. The deposits have been explored by several trenches and pits and about seven wagon drill holes, the deepest of which is about 70 feet deep. Slight radioactivity was detected in two or three of the pits but none could be detected in the drill-hole cuttings. Field checking indicated that radioactivity was usually only about twice

background and seldom over four times background. At no place was radioactivity sufficiently intense to be of possible commercial interest. Applicant's samples were selected specimens from the richest zone but applicant was unable to show the examiner exactly where the specimens were obtained. Two samples taken by the examiner from the same zone had radiometric analyses of 0.03% U_3O_8 and less than 0.01% U_3O_8. The deposits are not considered to be significant by the examiner or by representatives of the AEC. It is recommended that the application be denied.

Commodity Group comments:

U. S. Geological Survey, W. P. Williams, September 12, 1956.

The deposits have already been tested by pits, trenches, and test holes with poor results. High assay values submitted by the applicant could not be duplicated by check samples. Agrees with the examiners' and Field Team's recommendation for denial.

U. S. Bureau of Mines, John E. Crawford, September 18, 1956.

Report of examination reviewed with the AEC representative. Agrees with Field Team recommendation for denial.

Rare and Miscellaneous Metals Division, Michael Ching, September 21, 1956.

Radioactvity on the property was limited in extent. No ore grade material could be found. The property holds little or no promise.

Conclusions and Recommendations:

The chances of finding a commercial ore deposit on this property are poor. It is recommended that the application be denied.

Ernest Wm. Ellis

Ernest Wm. Ellis

9/18/56 gla

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

RECEIVED
SEP 18 1956

Date 9/18/56

DMEA Docket No. 4303
DMEA Contract No.
Commodity Uranium
Name of applicant Harold Raymond
Name of property Red Hills
Location of property Pima County, Arizona
Estimated cost of project

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee

From: John E. Crawford, Bureau of Mines Member
Uranium Commodity Committee

Subject: Review of Report of Examination
(Application, Field Team Report, etc.)

1. Date of subject document: 8/31/56. 2. Date received by reviewer: 9/11/56.

3. Prior reports on this property known to reviewer: Yes [ ], No [x].

4. Prior reports on nearby properties known to reviewer: Yes [ ], No [x].

5. Information available on past production: Yes [ ], No [x].

6. Other pertinent factors known to reviewer: Yes [ ], No [x].

7. Explain items marked yes above:

8. Factors needing special consideration:
   a. Location [ ]
   b. Ownership [ ]
   c. Evidence of mineralization [ ]
   d. Geology [ ]
   e. Proposed exploration method [ ]
   f. Alternate exploration method [ ]
   g. Costs [ ]
   h. _____ [ ]

9. Action advised:
   a. Obtain information from applicant [ ]
   b. Refer to Field Team [ ]
   c. Denial [x]
   d. Agree with Field Team [x]
   e. Disagree with Field Team [ ]
   f. Suggest alternate plan [ ]
   g. Request another examination [ ]
   h. Approval [ ]
   i. Consult with Mr. _____ at _____ AEC office.

10. Remarks: (Use back of page if necessary)

Mr. Joseph O. Hosted, Washington representative of the Atomic Energy Commission, assisted in the review.

9/13/56 gla

IN REPLY REFER TO:

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

RECEIVED
SEP 13 1956

September 12, 1956

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

From: W. P. Williams, U. S. Geological Survey

Subject: Review of field examination report, DMEA 4303, Harold Raymond, State leases, Pima County, Arizona.

The examining geologist reports that uranium mineralization on the property is spotty and of low grade. The deposits have already been tested by pits, trenches, and test holes with poor results. High assay values submitted by the applicant could not be duplicated by check samples from the property.

I agree with the examiner's and Field Team's recommendation for denial of the application.

W. P. Williams

W. P. Williams

9/13/56 gla

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

RECEIVED
SEP 10 1956

September 7, 1956

224 New Customhouse
Denver 2, Colorado

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Report of Examination, Docket DMEA 4303 (Uranium) Harold Raymond (State Leases Nos. Min-505 and Min-511) Pima County, Arizona

Enclosed are the original and three copies of an examination report on the subject property by the U. S. Geological Survey. The Bureau of Mines did not participate in the field examination.

The field examiner found that the property had been adequately tested and additional exploration is not justified. He recommends that the application be denied. We concur in this recommendation.

DMEA Field Team, Region III

W. M. Traver

By W. M. Traver
Executive Officer

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
9-12-56
(date)

RECEIVED
SEP 10 1956

DMEA
DEPARTMENT OF THE INTERIOR
SEP 6 1956
REGION III
DENVER, COLORADO

Box 4126 University Station
Tucson, Arizona

September 4, 1956

TRANSMITTED
SEP - 7 1956

MEMORANDUM

To: Executive Officer, DMEA Field Team, Region III

From: W. L. Emerick
W. R. Storms

Through: E. M. Harshman
Back for EMH

Subject: DMEA Docket 4303 (Uranium), Harold Raymond's State Leases, Pima County, Arizona

Enclosed are the original and eleven copies of an examination report on the above subject property by John N. Faick of the U. S. Geological Survey. Faick recommends denial of the application because the uranium is spotty in occurrence and of extremely low grade. The deposit offers little or no possibility of developing into a significant commercial operation.

As denial of the application is being recommended by the Survey and, as the Bureau engineer is familiar with the area and concurs, we assume it to be unnecessary for the Bureau to make a duplicate examination. The accompanying report represents the results of the Survey examination.

W L Emerick
W. L. Emerick

Signed by Walter R. Storms
W. R. Storms

WLE:ms

Enclosures

cc: Harshman (11)
Storms
Emerick

9-12-56

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

RECEIVED
SEP 10 1956

DEFENSE MINERALS EXPLORATION ADMINISTRATION

TRANSMITTED
SEP 7 1956

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

CONFIDENTIAL
NOT FOR PUBLIC INSPECTION OR QUOTATION

DMEA-4303 (Uranium) Harold Raymond's State Leases

Pima County, Arizona

John N. Faick, Geologist
U. S. Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE
9-12-56
(0280)

August 31, 1956

DMEA-4303 (URANIUM) HAROLD RAYMOND'S STATE LEASES
PIMA COUNTY, ARIZONA

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Sketch Map, Red Hills Uranium Prospect -------- Folder on back cover

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RECEIVED
SEP 10 1956

INTRODUCTION

An application, DMEA 4303, dated May 23, 1956, was submitted to the Defense Minerals Exploration Administration by Harold Raymond, 15 Oakmont Drive, Los Angeles 49, California, requesting assistance in exploration for uranium of the "Red Hills" prospect in Pima County, Arizona. The property consists of 11 claims (see fig. 1-A), the Red Hills Nos. 1-10, inclusive, and Blue No. 3. The property lies in the east half of Section 6 and the west part of section 5, in T. 16 S, R 17 E. The approximate center of the group of claims is about 3500 feet northwest of Colossal Cave, near Vail, Arizona, and can easily be reached by driving eastward from Tucson, Arizona, over approximately 30 miles of paved and graded roads. The claims are controlled by location and by sub-leases of land owned by the State.

The property was examined August 6, 1956 by the writer accompanied by the applicant and two of his associates, James C. Kelley and Clyde Jones, all of Los Angeles, California. On August 9 the writer, accompanied by W. L. Emerick, returned to the area to obtain samples and study details of the deposit without the presence of the applicants. The applicants provided a geological report on the property by F. J. Frankovitch, Consulting Geologist, Phoenix, Arizona. Such information as is available from the AEC was obtained by the writer through its Tucson, Arizona representative, Robert Miller. Additional information was obtained from published works.[1/]

1/ Darton, N. H. A resumé of Arizona Geology, Ariz. Bureau of Mines Bull. 119, pp. 282-283, fig. 94, 1925.
Guidebook of Western United States, Southern Pacific Lines, Part F, U.S. Geol. Survey, Bull. 845, pp. 182-183, 1933.

GEOLOGY

The Red Hills prospect lies within the Shaw's Ranch area as described by Darton[2/]. In this area he recognized formations believed to be Pioneer shale, Scanlon conglomerate and Dripping Spring quartzite of pre-Cambrian age, and limestones of Paleozoic age. The basement rock is pre-Cambrian granite. Darton says:

> "Faults complicate the relations somewhat and at several places portions of the younger limestone (Devonian and Carboniferous) are replaced by silica in large bodies which might easily be mistaken for quartzite. In the northern part of the area this limestone is thrust northward up the granite slope."

Lying within the area of the Red Hills group of claims are four low hills in which intensely silicified brecciated limestones are exposed at the surface. As the silicified breccia contains more-or-less iron, it is properly termed jasper. Only a small part of the limestone, consisting mostly of isolated remnants, remain; most of it has been converted to jasper by processes of silicification which obviously increase in intensity from west to east. The age of the limestone is unknown, but might be determined with further study by means of fossil remnants found in it.

Structural conditions of the breccia masses were not clearly ascertainable during the short time spent in the field, but it appears that the limestone beds strike northerly and dip westward at angles of 20 or 25 degrees. Possibly some of the beds are steeply inclined westward or are nearly vertical. Grooves on gently dipping polished surfaces indicate that low angle faulting, probably along the bedding-planes, has occurred in the area, and presumably this is largely responsible for the brecciation of the limestone prior to silicification.

2/ Op. Cit. p.282-283

In places steeply dipping joints and fractures having a NNE strike cut across the breccia, and obscure southeasterly trending joints. Field conditions indicate that the jasper breccia forms a thin, resistant capping of the four low hills in which it is found, and presumably it does not extend to great depths. Possibly the jasper masses are down-dropped fault blocks, but this is not ascertained.

The jasper deposits have been explored by several trenches and pits (see fig. 1-B) and by about 7 wagon drill holes, the deepest of which is reported to be about 70 feet deep. Slight radioactivity was detected in 2 or 3 of the pits but none could be detected in the drill hole cuttings.

Slight radioactivity could be detected at several places in the jasper but at no place was it present in sufficient quantity to appreciably affect the geiger counter. Field checking indicated that radioactivity was usually only about twice background, and seldom over about four times background. Direct readings in mr/hr ranged from a few hundredths to a few tenths. At no place was radioactivity sufficiently intense to be of possible commercial interest. The richest zone is shown on figure 1-B at the location of samples 13413 and 13414, which were taken from the same zone from which samples were taken by the applicants. The applicants samples were selected specimens but the applicants were unable to show the examiner exactly where the specimens were obtained. Consequently, it was not possible to duplicate their results.

Analyses supplied by the applicants, which represent specimens selected at random, are shown in Table I. The last two analyses shown are DMEA samples taken from the same area as the applicants' samples.

TABLE I

Analyses of samples from Red Hills No. 1 claim

Date	Analyst	Radiometric U_3O_8	Chemical U_3O_8
2/21/55	U. S. Bureau of Mines, Tucson Through AEC.	0.32	
3/ 4/55	Keldon Research Corp., Los Angeles		0.20
4/14/55	U. S. Bureau of Mines, Tucson Through AEC.	0.45	0.42
5/ 6/55	Eisenhauer, Los Angeles	0.90	0.42
8/ 9/56	(1) DMEA, Tucson	0.03	
8/ 9/56	(2) DMEA, Tucson	less than 0.01	

The sample reported in the table under date 2/21/55 was examined microscopically, apparently by LaMar G. Evans, U. S. Bureau of Mines, and it was reported to contain quartz, hematite, pyrite and uranophane. Neither pyrite nor uranophane was found during the field examination. The radioactivity is "spotty" in distribution. Geological explanation for this is lacking; however, distribution may be influenced by secondary jointing and brecciation of the jasper. At no place does the uranium appear to be present in possible commercial amounts.

CONCLUSIONS AND RECOMMENDATIONS

Examination of the Red Hills prospects, DMEA application 4303, indicates that the uranium is spotty in occurrence and of extremely low grade, and offers little or no possibility of developing into a commercial operation. The deposits are not considered to be significant by representatives of the AEC, and the writer shares this opinion. The deposits are adequately tested by shallow pits and trenches and by shallow test holes without revealing encouraging amounts of uranium. As additional exploration is not justified, it is recommended that the application be denied.

9/10/56 gla

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

September 7, 1956

224 New Customhouse
Denver 2, Colorado

RECEIVED
SEP 10 1956

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Report of Examination, Docket DMEA 4303 (Uranium) Harold Raymond (State Leases Nos. Min-505 and Min-511) Pima County, Arizona

Enclosed are the original and three copies of an examination report on the subject property by the U. S. Geological Survey. The Bureau of Mines did not participate in the field examination.

The field examiner found that the property had been adequately tested and additional exploration is not justified. He recommends that the application be denied. We concur in this recommendation.

DMEA Field Team, Region III

W. M. Traver

By W. M. Traver
Executive Officer

Enclosures

APPROVED BY
DMEA OPERATING COMMITTEE
9-12-56
(date)

DMEA
DEPARTMENT OF THE INTERIOR
SEP 6 1956
REGION III
DENVER, COLORADO

RECEIVED
SEP 10 1956

Box 4126 University Station
Tucson, Arizona

September 4, 1956

TRANSMITTED
SEP - 7 1956

MEMORANDUM

To: Executive Officer, DMEA Field Team, Region III

From: W. L. Emerick
W. R. Storms

Through: E. N. Harshman
RWC for ENH

Subject: DMEA Docket 4303 (Uranium), Harold Raymond's State Leases, Pima County, Arizona

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As denial of the application is being recommended by the Survey and, as the Bureau engineer is familiar with the area and concurs, we assume it to be unnecessary for the Bureau to make a duplicate examination. The accompanying report represents the results of the Survey examination.

W L Emerick
W. L. Emerick

Signed by Walter R. Storms
W. R. Storms

WLE:ms

Enclosures

cc: Harshman (11)
Storms
Emerick

RECEIVED
SEP 1956

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

TRANSMITTED
SEP 7 1956

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

CONFIDENTIAL
NOT FOR PUBLIC INSPECTION OR QUOTATION

DMEA-4303 (Uranium) Harold Raymond's State Leases

Pima County, Arizona

John M. Faick, Geologist
U. S. Geological Survey

August 31, 1956

IMRA-4303 (URANIUM) HAROLD RAYMOND'S STATE LEASES
PIMA COUNTY, ARIZONA

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Sketch Map, Red Hills Uranium Prospect-------- Folder on back cover

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RECEIVED
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The property was examined August 6, 1956 by the writer accompanied by the applicant and two of his associates, James C. Kelley and Clyde Jones, all of Los Angeles, California. On August 9 the writer, accompanied by W. L. Emerick, returned to the area to obtain samples and study details of the deposit without the presence of the applicants. The applicants provided a geological report on the property by F. J. Frankovitch, Consulting Geologist, Phoenix, Arizona. Such information as is available from the AEC was obtained by the writer through its Tucson, Arizona representative, Robert Millar. Additional information was obtained from published works. 1/

1/ Darton, N. H. A resumé of Arizona Geology, Ariz. Bureau of Mines Bull. 119, pp. 282-283, fig. 94, 1925.
Guidebook of Western United States, Southern Pacific Lines, Part F, U.S. Geol. Survey, Bull. 845, pp. 182-183, 1933.

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Lying within the area of the Red Hills group of claims are four low hills in which intensely silicified brecciated limestones are exposed at the surface. As the silicified breccia contains more-or-less iron, it is properly termed jasper. Only a small part of the limestone, consisting mostly of isolated remnants, remain; most of it has been converted to jasper by processes of silicification which obviously increase in intensity from west to east. The age of the limestone is unknown, but might be determined with further study by means of fossil remnants found in it.

Structural conditions of the breccia masses were not clearly ascertainable during the short time spent in the field, but it appears that the limestone beds strike northerly and dip westward at angles of 20 or 25 degrees. Possibly some of the beds are steeply inclined westward or are nearly vertical. Grooves on gently dipping polished surfaces indicate that low angle faulting, probably along the bedding-planes, has occurred in the area, and presumably this is largely responsible for the brecciation of the limestone prior to silicification.

2/ Op. Cit. p.202-203

In places steeply dipping joints and fractures having a NNE strike cut across the breccia, and obscure southeasterly trending joints. Field conditions indicate that the jasper breccia forms a thin, resistant capping of the four low hills in which it is found, and presumably it does not extend to great depths. Possibly the jasper masses are down-dropped fault blocks, but this is not ascertained.

The jasper deposits have been explored by several trenches and pits (see fig. 1-B) and by about 7 wagon drill holes, the deepest of which is reported to be about 70 feet deep. Slight radioactivity was detected in 2 or 3 of the pits but none could be detected in the drill hole cuttings.

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8/ 9/56	(1) BMEA, Tucson	0.03	
8/ 9/56	(2) BMEA, Tucson	less than 0.01	

The sample reported in the table under date 2/21/55 was examined microscopically, apparently by LaMar G. Evans, U. S. Bureau of Mines, and it was reported to contain quartz, hematite, pyrite and uranophane. Neither pyrite nor uranophane was found during the field examination. The radioactivity is "spotty" in distribution. Geological explanation for this is lacking; however, distribution may be influenced by secondary jointing and brecciation of the jasper. At no place does the uranium appear to be present in possible commercial amounts.

CONCLUSIONS AND RECOMMENDATIONS

Examination of the Red Hills prospects, DMRA application 4303, indicates that the uranium is spotty in occurrence and of extremely low grade, and offers little or no possibility of developing into a commercial operation. The deposits are not considered to be significant by representatives of the AEC, and the writer shares this opinion. The deposits are adequately tested by shallow pits and trenches and by shallow test holes without revealing encouraging amounts of uranium. As additional exploration is not justified, it is recommended that the application be denied.

6-15-56

DMEA
Date Rec'd

JUN 13 1956

BUREAU OF MINES
Denver, Colorado

June 13, 1956

RECEIVED

JUN 15 1956

Memorandum

To: W. R. Storms

From: Superintendent, Denver Experiment Station, Reg. III

Subject: Docket DMEA 4303 (Uranium), Harold Raymond (State Leases Nos. Min-505 & Min-511, Pima County, Arizona

Enclosed is the application on Docket DMEA 4303, Harold Raymond, Pima County, Arizona in the amount of $7,100.

A field examination should be made and suitable report prepared. The completed report should be forwarded directly to the Executive Officer, with a copy of the memorandum of transmittal to this office.

JOHN F. SHAW

John F. Shaw

cc: W. M. Traver (3)
E. N. Harshman
J. N. Faick
Sec. Op. Com (2)

RECEIVED
JUN 1 5 1956

DMEA
Date Rec'd.
JUN 13 1956

BUREAU OF MINES
Denver, Colorado

June 13, 1956

Memorandum

To: W. R. Storms

From: Superintendent, Denver Experiment Station, Reg. III

Subject: Docket DMEA 4303 (Uranium), Harold Raymond (State Leases Nos. Min-505 & Min-511, Pima County, Arizona

Enclosed is the application on Docket DMEA 4303, Harold Raymond, Pima County, Arizona in the amount of $7,100.

A field examination should be made and suitable report prepared. The completed report should be forwarded directly to the Executive Officer, with a copy of the memorandum of transmittal to this office.

John F. Shaw

cc: W. H. Traver (3)
E. N. Harshman
J. H. Faick
Sec. Op. Com. (2)

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

RECEIVED
JUN 14 1956

June 11, 1956

[illegible] New Continental
Denver 2, Colorado

Gentlemen:

To: J. F. Shaw (2) (With brochure)
J. H. Fulmer

From: Field Team, Region III

Subject: Docket DMEA 4303 (Mountain) Harold Hagmann (Phelps Lease) Nos. Min-505 & Min-511, Pima County, Arizona

Enclosed is the subject application in the amount of $7,300. A field examination and suitable report are required.

Also enclosed for your information is a copy of a letter from the Chairman, Operating Committee with attached memorandum of review of the application by John H. Crawford and H. H. Nelson.

Please return the brochure with the Report of Examination.

DMEA Field Team, Region III

W. M. TRAVER,

By W. M. Traver
Executive Officer

Enclosures

WMT:ab

cc: Docket 4303
Chair. Op. Comm. (2)
Harrison
Chron.

RECEIVED
JUN 14 1956

June 11, 1956

[illegible]
Denver 2, Colorado

Gentlemen:

To: J. T. Shaw (2) (With brochure)
J. R. Fabik

From: Field Team, Region III

Subject: Brochure [illegible] (Brandon) Mineral Segment (State Lease Nos. [illegible] & [illegible]), Pima County, Arizona

Enclosed is the subject application in the amount of $7,100. A field examination and suitable report are required.

Also enclosed for your information is a copy of a letter from the Chairman, Operating Committee with attached memorandum of review of the application by John E. Crawford and R. E. Nelson.

Please return the brochure with the Report of Examination.

DMEA Field Team, Region III

W. M. TRAVER,

By W. M. Traver
Executive Officer

Enclosures

DMEA:ab

cc: Brochure 4305
Chadr. Op. Comm. (2)
Brochure
Chron.

700

FILE COPY

Surname:

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

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Region III
22d New Customhouse Building
Denver 2, Colorado

JUN - 8 1956

Re: Docket No. DMEA-4303 (Uranium)
Harold Raymond
State Leases Nos. Min-505 & Min-511
Pima County, Arizona

Dear Mr. Traver:

The subject application is being referred to you for investigation, a field examination if warranted, and recommendations. A copy of the application was retained in your office.

Copies of memoranda, dated May 28, 1956, by John E. Crawford, USBM, and N. E. Nelson, USGS, relating to the application, are enclosed for your information.

Your attention is called to the fact that the Applicant's description of the land to be explored is not complete, and no claim map accompanied the application.

In the event a contract is recommended by the Field Team, it is suggested that the Applicant be advised to prepare to furnish a Performance Bond in lieu of a Consent to Lien by the State of Arizona. In addition to such bond, a Consent to Lien would be required of James C. Kelley and Clyde Jones.

Sincerely yours,

W. S. Martin
ACTING Chairman, Operating Committee (WB)

Enclosures

APPROVED:

/s/ Robert W. Geehan (WB)
Member, Bureau of Mines

Thor H. Kiilsgaard (WB)
Member, Geological Survey

FMMurphy/izm 6-5-56
cc to: Docket
Code 700
Mr. Murphy
Admr.'s Reading File
Operating Committee
Messrs. JECrawford, Rm. 3643
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA

R.C.

700

FILE COPY
Surname:
Ching
Ellis
Martin
Fitzgerald

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

JUN - 8 1956

Mr. Harold Raymond
15 Oakmont Drive
Los Angeles 49, California

Re: Docket No. DMEA-4303 (Uranium)
State Leases Nos. Min-505 and Min-511
Pima County, Arizona

Dear Mr. Raymond:

Receipt is acknowledged of your letter of May 29, 1956, addressed to the attention of Mr. Robert E. Adams.

The application for assistance in exploring your property, under the captioned docket number, has been reviewed by the Rare and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. It has been referred to:

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Region III
224 New Customhouse Building
Denver 2, Colorado

Your application will be reviewed and investigated by the Regional Office and a field examination of your property will be scheduled, if warranted. The Regional Office will contact you in regard to your project if additional information is required.

Please rest assured that we shall continue to process your application as expeditiously as possible.

Sincerely yours,

G. O. Mittendorf

Administrator

MChing/izm 6-7-56
cc to: Docket
Admr.'s Reading File
~~Operating Committee~~
Mr. Ching
Code 700
DMEA Field Team, Region III (2)

R.C.S.

700

FILE COPY
Surname: Ching

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

Mr. Harold Raymond
15 Oakmont Drive
Los Angeles 49, California

Re: Docket No. DMEA-4303 (Uranium)
State Leases Nos. Min-505 and Min-511
Pima County, Arizona

Dear Mr. Raymond:

The application for assistance in exploring your property, under the captioned docket number, has been reviewed by the Rare and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. It has been referred to:

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Region III
224 New Customhouse Building
Denver 2, Colorado

The Regional Office will contact you in regard to your project if additional information is required.

Receipt is acknowledged of your letter of May 29, 1956, addressed to the attention of Mr. Robert E. Adams. Your application will be reviewed and investigated by the Regional Office and a field examination of your property will be scheduled, if warranted. Upon receipt of a Report of Examination by our field personnel, we will be in a position to either deny your application or draw up an exploration contract for your approval. The whole procedure may require several months.

Sincerely yours,

Administrator

MChing/izm 6-5-56
cc to: Docket
Code 700
Mr. Ching
DMEA Field Team, Region III (2)
Admr.'s Reading File

6/1/56

HAROLD RAYMOND
15 OAKMONT DRIVE
LOS ANGELES ~~24~~, CALIF.
49

RECEIVED
MAY 31 1956

May 29, 1956

United States Dept. of the Interior
Defense Mineral Exploration Administration
Washington, 25, D. C.

Attention Mr. Robt. E. Adams

Re: Exploration Assist.
Red Hills Uranium Deposit

Subject: DMEA-4303

Gentlemen:

I received your letter acknowledging receipt of my application for exploration assistance.

I am so very anxious to get started on this project that I thought you might be able to relieve my anxiety some if you could tell me about when you might act on this particular project. My geologist, Mr. Frank Frankovich, feels these claims are the greatest find in Arizona and assures me it will produce more Uranium than any mine in Arizona. So, with this assurance, along with the huge investment I already have in these claims you can see why I am so anxious to get started.

I certainly would appreciate hearing from you giving me what information you can.

Very truly yours,

H. Raymond

5/29/56 gla

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

RECEIVED
MAY 29 1956

May 28, 1956

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee

From: John E. Crawford, Bureau of Mines Member
Uranium Commodity Committee

Subject: Application for Assistance, DMEA Docket No. 4303,
Pima County, Arizona, Harold Raymond

I have reviewed the attached application for assistance, Docket 4303, Harold Raymond, Pima County, Arizona, dated April 20 and received in this office May 23, 1956. I have also discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

The applicant reports that uranophane assaying up to 0.45 percent U_3O_8 has been found in surface rocks on the subject claims. He is desirous of exploring the claims by 350 feet of diamond drilling at $5 per foot, 1,075 feet of wagon drilling at $2 per foot, and 40 hours of bulldozing at $12.50 per hour. The total estimated cost of the project is $7,100.

Referral of the application to the field for appropriate action is recommended. It would be advisable for the field team to consult with E. E. Thurlow, Chief, Salt Lake Exploration Branch, Atomic Energy Commission, for information he may have regarding the subject area.

John E. Crawford

John E. Crawford

Attachment

5/31/56

IN REPLY REFER TO:

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

RECEIVED
MAY 29 1956

May 28, 1956

Re: DMEA 4303
Harold Raymond
Red Hills Uranium deposit
Pima County, Arizona
$7,100 - Uranium

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of application

The applicant requests assistance in exploring, by bulldozing, core and wagon drilling, a series of bedded rocks containing a uranium-bearing brecciated limestone.

From 2 pits samples representing "several square feet" of surface, have been taken. Assaying shows values of 0.12, 0.2 and 0.45% U_3O_8 according to the geologists' report. From another pit a sample assaying 0.08% U_3O_8 over 18 inches was taken.

Apparently this is a new discovery in an area not here-to-fore known to contain uranium-bearing rocks.

Referral to the Field Team for appropriate action is recommended.

N. E. Nelson

N. E. Nelson

IN REPLY REFER TO:

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

RECEIVED
MAY 29 1956

May 28, 1956

Re: DMEA 4303
Harold Raymond
Red Hills Uranium deposit
Pima County, Arizona
$7,100 - Uranium

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of application

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From 2 pits samples representing "several square feet" of surface, have been taken. Assaying shows values of 0.12, 0.2 and 0.4% U_3O_8 according to the geologists' report. From another pit a sample assaying 0.08% U_3O_8 over 18 inches was taken.

Apparently this is a new discovery in an area not here-to-fore known to contain uranium-bearing rocks.

Referral to the Field Team for appropriate action is recommended.

N. E. Nelson

N. E. Nelson

NENelson:jeh
5/28/56
cc: Director's reading 4212
Branch " "
DMEA (3)
Docket file
J. E. Crawford, 3641
J. O. Hosted, 3210 GSA

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

RECEIVED
MAY 23 1956

May 21, 1956

224 New Customhouse
Denver 2, Colorado

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Application for DMEA Aid (Uranium), Harold Raymond, Arizona State Mineral Leases No. 11 505 and No. 11 511, Pima County, Arizona

Enclosed are three copies of the subject application in the amount of $7,100.00. One copy of the application is being retained in our file.

DMEA Field Team, Region III

By J. W. Townsend
Acting Executive Officer

Enclosures

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

RECEIVED
MAY 23 1956

May 21, 1956

224 New Customhouse
Denver 2, Colorado

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Application for DMEA Aid (Uranium), Harold Raymond, Arizona State Mineral Leases No. 11 505 and No. 11 511, Pima County, Arizona

Enclosed are three copies of the subject application in the amount of $7,100.00. One copy of the application is being retained in our file.

DMEA Field Team, Region III

J. W. Townsend

By J. W. Townsend
Acting Executive Officer

Enclosures

May 23, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region III.

DMEA
- 4303 Harold Raymond

Robert E. Adams
Chief, Operation's Control
and Statistics Division

May 23, 1956

Mr. Harold Raymond
15 Oakmont Drive
Los Angeles 49, California

Subject: DMEA-4303
Re: Exploration Assistance
Red Hills Uranium Deposit

Dear Mr. Raymond

The receipt of your application dated April 20, 1956 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-4303 and referred to the Rare & Misc. Metals Division.

Kindly identify all future correspondence relating to your application by this docket number.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

MF-103
(Revised April 1952)

5/23/56

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMI

RECEIVED
MAY 23 1956

DMEA
Date Rec'd.
Form Approved.
Budget Bureau No. 42-R1035.2.
MAY 21 1956
BUREAU OF MINES
Denver, Colorado

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 out by applicant.

Docket No. DMEA - 4303
Metal or Mineral Uranium
Date Received 5/23/56
Estimated Cost $7,100
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: Harold Raymond
15 Oakmont Drive
Los Angeles 49, California

(*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: Only an individual

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

(*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 Sheet #1 ref. No. 1

(*b*) State any mine name by which the property is known. Red Hills Uranium Deposit

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

(*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 None

(*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 REFERENCE #3 ON ATTACHED SHEETS FOR ANSWERS TO QUESTIONS 4-A, B, C, AND D.

(*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. See reference No. 4

16—66551-1

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore Uranium and any associated valuable minerals.

(*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. See reference No. 5.

(*c*) The work will start within 60 days and be completed within 4 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 reference No. 6

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.).

(*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.

(*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.

(*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.

(*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.

(*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.

(*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 April 20, 1956

Harold Raymond
(Applicant)

By Harold Raymond

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

RECEIVED
MAY 23 1956

Harold Raymond
15 Oakmont Drive
Brentwood 24, Calif.

Ref. No. 1 to Item No. 3-A

The lands to be explored are Arizona State Mineral leases described in their books as follows:

Lease No. 11 511 (July 29, 1955)	Section	Township	Range	Acres
NESE	6	16S	17E	40.00
NWNWSW	5	16S	17E	15.00
W2SWNWSW	"	"	"	55.00
Lease No. 11 505 (May 24, 1955)				
W2W2NW	5	16S	17E	31.20
E2NE	6	16S	17E	101.80
S2NWNE	"	"	"	
N2SWNE	"	"	"	133.00
			Total	376.00

These leases are between the State of Arizona Land Department and Bernard Hughes, Richard Wm. Hughes, James C. Kelley, and Clyde Jones, as lessee.

Ref. No. 2 to Item No. 4-A

The only work done on these leases has been that discovery work necessary to perfect the claims and consists only of discovery work in the form of pits.

A minor amount of trenching and pitting was done on "hot" spots before the owners exhausted their funds. No conventional shafts, mining, nor drilling has been done. No mapping of the occurrence has been undertaken.

The deposit is easily accessible by good road. A conventional passenger car can be driven to within 50 yards of the main occurrence. Access requires driving about 8 miles off pavement on good gravelled road.

Ref. No. 3 to Item No. 4-A, B, C, and D.

See accompanying geologic report for detailed answers to all of these questions.

Ref. No. 4 to Item No. 4-C

Manpower, materials, & supplies are easily available in Tucson 26 miles distant. Water for drilling would have to be hauled about 2 miles, however, most drilling for testing can be done with air. Power lines are about six miles distant.

Ref. No. 5 to Item No. 5-B

The general program to be followed is outlined in the Recommendations part of the accompanying geologic report. (Fig. I)

The geology of the area will be mapped on serial photographs and then a radiometric survey will be made to locate and outline the trends of anomalies.

The second stage of the project will consist of drilling two diamond drill holes, and possibly three, for information on litholgy, mineralization, general structure, and to provide a guide for the interpretation of wagon drill cuttings.

At the time of diamond drilling some work will be done with a bulldozer to expose the surface geology where necessary and to give additional information on the radiometric anomalies.

Figure I illustrates the relation between the drill holes and the geology of the deposit. The writer has seen two instances where an almost identical geologic situation existed and the uranium was exposed the same way and related to identical rock types and a covered contact. It is believed, therefore, that the best possibilities for the occurrence of uranium is at the contact between the different rock types. The diamond drill holes shown on the cross section are located to test the mineral possibilities at the contact and to establish the geology.

Figure No. 2 is a sketch map of the areal geology showing the outcrops, contacts, and igneous intrusions. The location of the diamond drill holes. The general distribution of the wagon drill holes.

Reference No. 6 to Item No. 5-D

The applicant has had no mining experience but he has engaged Mr. Frank J. Frankovich, consulting geologist of Phoenix, Arizona to supervise all phases of the work from the original mapping through the drilling and logging, to the final report on the results of the project. Mr. Frankovich has the following background: B. S. Degree in Geological Engineering, 2 years experience as a miner, 1½ years as a geologist with the Anaconda Copper Mining Company, 2 years as a geologist with the Arabian American Oil Company, 4 years as a geologist with the Atomic Energy Commission in Australia, New Zealand and the Colorado Plateau, 1½ years as a consultant geologist in all parts of the U. S. and parts of Mexico. For the USAEC Mr. Frankovich did much reconnaissance work and also conducted a number of drilling and exploration projects. He also did geological reconnaissance and supervised structural drilling for the Arabian American Oil Company.

ESTIMATE OF COSTS

6-a	Independent Contracts:	
	Bulldozer - digging trenches across anomalies, preparing drill sites, exposing geologic section, 40 hours at 12.50 per hour and $200 moving charge.	$500
	Aerial photographs and base map at 200 feet per inch	300
	Diamond drilling at $5.00 per foot - 2 holes totaling 350 feet	1750
	Wagon Drilling at $2.00 per foot and 1075 feet	2150
6-b	Labor, supervision, and colsultants,	
	Field geologists time and expenses for six weeks for radiometric survey (grid), geologic mapping, core logging, hole logging, sampling, surveying holes, and general supervision.	1000
	Supervising consultant geologist for planning supervision of field geologist, evaluation of results an and preparation of final report. Will make about six two-day trips to the project	750
6-c	Operating materials and supplies. Miscellaneous supplies flagging, stakes, sacks, etc.	100
6-d	Operating equipment. Rental of radiomentric hole logging equipment $100, rental of surveying equipment $150	250
6-e	Rehabilitation and repairs. None	0
6-f	New buildings, improvements, installations. None	0
6-g	Miscellaneous. Fencing of pits for safety of livestock according to state law $200	200
6-h	Contingencies	100
		$7,000

RECEIVED
MAY 23 1956

RED HILLS URANIUM OCCURRENCE

26 MILES SE OF TUCSON, ARIZONA

by

F. J. Frankovich

April 1955

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Stratigraphy	2
Igneous Rocks	4
Structure	4
Mineralogy	4
Samples	4
Mineralization Controls	5
Origin of the Uranium	6
Conclusions	6
Recommendations	7

RECEIVED
MAY 23 1956

ABSTRACT

This significant uranium occurrence in a brecciated, thinly interbedded silicified shale and limestone of Cretaceous age has ore grade samples on the outcrop but only a ton or so of such material is exposed. Visible uranophane was found in surface rocks and assays up to 0.45% U_3O_8 have been obtained. The distribution of the mineralization is irregular and exposed in several pits and outcrops. The uranium at this time cannot be related to any specific geologic feature other than rock type, therefore, no estimate of ore reserves can be made nor can an accurate appraisal of its possibilities be made without drilling the deposit. The writer has seen two instances in the Northern Territory of Australia where multi-million dollar deposits were found under outcrops having no better surface indications than the Red Hills deposit. Moreover, the host rock in the two Australian deposits is the same as that in the Red Hills deposit. Experience indicates that the best places to look for uranium are those which are similar in geology to known deposits. For this reason, the cost of testing the Red Hills deposit is considered to be a good risk.

It is estimated that about $ ~~6,800~~ 7,000 spent on geological and radiometric surveying, bulldozing, core drilling and supervision is sufficient to test the deposit. However, if ore is discovered in this stage additional funds will be required to block it out with the relatively inexpensive methods of wagon or air-rotary drilling.

RED HILLS URANIUM OCCURRENCE

26 MILES SE OF TUCSON, ARIZONA

RECEIVED
MAY 23 1956

INTRODUCTION

Location and Accessibility

This uranium occurrence is located 26 miles southeast of Tucson, Arizona, and is easily accessible with ordinary automobile by taking U. S. Highway 80 southeast out of Tucson. Twenty miles out, turn northeast at Vail on the road marked by a sign "Colossal Cave." Take the left road of a fork about six miles out along this graded road; then proceed a few miles to the next cross-roads which will have a sign on the left reading "Colossal Cave." After making a right turn at this junction toward "Colossal Cave" and travelling 0.6 miles one can see another trail off to the left which after 300 yards will bring one on to the radioactive outcrop. The entire area of interest is accessible by pick-up truck and development of any kind would not require road building more costly than brush clearing with a bulldozer.

Topography

The uranium-bearing formation forms a low, rounded, rocky dissected ridge one mile long trending in a northwesterly direction. One half mile to the south and one-half mile to the east the terrain becomes very steep and impossible for the most part even to four wheel drive vehicles. The remaining terrain is of low relief and easily traversed.

History

No mining has ever been done in this area and no old prospect pits are to be seen.

Radioactivity was first found in the area by Clyde Jones and associates of southern California in February 1955, after they traced down a radioactive rock found in a little girl's rock collection in Lynwood, California. They immediately staked claims over and well beyond the area of interest, being

careful to abide by all the details of the law to perfect their claims, which are now indisputably valid. They need do no more work on them until June 30, 1956, to maintain their title.

No development work of consequence has been done other than the pits required by law. The substantial cost of these left the owners without funds for development.

REGIONAL GEOLOGY

The deposit is found at the southeastern base of the Santa Catalina Mountains (Sec. 6, T. 16 S., R. 17 E.). These northwest-trending ranges consist of pre-Cambrian schists and gneiss of various kinds with a nucleous of granite rocks. Overlying Paleozoic rocks occur extensively, especially on the north side, including shaly limestone with many Devonian fossils. Great masses of diorite penetrate the granite and overlying strata and some of the limestones in the latter are changed to marble.

Little structural deformation of paleozoic rocks took place until the Mesozoic era. There was, however, a long period of nondeposition and some faulting after Permian time and in some areas paleozoic rocks were deeply eroded before Cretaceous deposition. It is believed that the Rincon Valley vicinity was such an area where Cretaceous sediments lie on Naco (Pennsylvanian) limestone.

After Cretaceous sediments were laid down, wide-spread and diverse intrusive activity took place. Intrusion was accompanied by faulting and followed by thrust faulting.

GEOLOGY OF THE MINERAL DEPOSIT

Stratigraphy at the Deposit

The stratigraphy in the vicinity of the deposit is obscured by cover, faulting and the intrusion of diabase and andesite into the sediments. No contacts are visible. Fortunately, however, one limestone outcrop under the uranium-bearing bed was found to contain fossils which date it as the Naco limestone of Pennsylvanian Age. This in turn dates the younger, uranium-bearing bed as possible Permian and probable Cretaceous.

A very generalized approximation of the section is set forth below from top to bottom:

Thickness	Rock Type
	Alluvium and diabase intrusion
50' plus	Dark limestone with gnarled and brecciated cherty bands.
50'	Sub-rounded boulder and pebble arkosic conglomerate with coarse particles of all types and of deep red color interbedded with green, red, purple silt and sandstones with some lime content.
80'	Covered
40'	Fine-grained pink and gray arkosic, in part a granular conglomerate, partially granitized.
90'	Thinly interbedded silicified white to gray shale with slightly ferruginous, red limestone, which, as the result of dynamic metamorphism, has the appearance of a white, angular, cherty breccia in a dark matrix. This member contains uranium and other metallic sulphides and forms a long, low, dissected prominent ridge.
85'	Covered except for pit which exposes soft, silty, bentonitic (?), pink and gray mudstone with dip fonformable with upper conglomerate.
40'	White, crystalline limestone with Pennsylvanian age fossils and of indeterminate thickness underlain by a dark blue limestone with sparse, thin, broken cherty laminae near base, which increase in size and number upward in the member. This limestone takes on, near the top, the appearance of the brecciated limestone about 85' above.
70'	Covered.
—	Diabase and granite.

Igneous Rocks

Diabase and nadesite intrusions abound in the area. Diabase underlies the lower limestone and is found all around the sediments described. Andesitic masses irregularly intrude the entire area.

The writer believes that volcanic ejecta are important constituents in all the section described except the limestones.

Structure

Rather complex faulting and folding in the region make clear interpretation of the structure impossible without much detailed mapping. The uranium-bearing bed is in a down-dropped, southwest tilted block of sediments. To the northeast, northwest, and southwest of the block is found a complex of pre-Cambrian granite and later diabase and andesite intrusions. Southeast of the block Cambrian and later rocks are lifted high above the younger rocks in the down-dropped block. At least 5 southwest striking faults off-set the northerly strike of the uranium-bearing formation. Significant additional detail on the structure cannot be had until drilling and detailed surface stripping have been done.

Mineralogy

Finely disseminated sulphides are visible but the metallic minerals are largely sub-macroscope. In one specimen the author observed a small number of minute crystals which appear to be torbernite. The U. S. Bureau of Mines at Tucson made a binocular microscope study of the minerals and reports that uranophane (a uranium silicate), pyrite, and magnetite are present in the rock. It is the writer's opinion that very fine-grained uraninite is present in the rock also, because of all the considerable "count" contained in the rock emanated from such secondary minerals as uranophane, they would be conspicuously visible.

Anomalous radioactivity is found along the entire outcrop of the formation containing the uranium which is one mile from end to end. The outcrop is not continuous, however, but is broken by cross faults and covered by alluvium for about a third of this distance. Radioactive rubble covers both slopes of the ridge and increases the apparent width of the source bed.

Samples

Sample values are difficult to appraise because of the

erratic distribution of the mineral. There are no veins, nor as yet, beds of mineralization exposed which can be systematically sampled, and in turn allow computing the ore reserves.

Sample values up to .45% U_3O_8 have been obtained representing several square feet of wall in a pit. A number of different and similar spots in two pits about 300' apart will assay 0.12 to 0.2% U_3O_8. A third pit, 50' off the line of the other two will assay about 0.08% over an 18" width.

Leaching of the outcrop probably has taken place, particularly if the elements necessary to form insoluble uranium minerals were not present in the host rock. For instance, if abundant phosphate was in the host rock any uranium in the vicinity would be fixed and stay in place as insoluble uranium-phosphate minerals such as autunite, or torbernite if copper were also present. Uranium minerals generally are highly soluble in either slightly acid or basic waters and the leaching of outcrops is a common result.

The random location of the pits and the lack of systematic trenching makes an estimation of grade and tonnage impossible. The samples are truly significant only in proving that uranium is present and that mineralizing solutions could well have produced ore bodies in the vicinity.

Mineralization Controls

At first sight it appears that the best mineralization is found in zones of greater fracturing because in several instances this is true. Close inspection, however, reveals that some zones of intense fracturing contain high count in one part of a pit but are pretty "dead" in another part of the pit a few feet away. In other instances high count is found in solid rock near highly fractured zones which are "dead."

Nevertheless, it can be seen in some large specimens exhibiting a dense non-brecciated rock adjacent to a well-cemented brecciated zone of similar rock type, that the brecciated zone only contains visible sulphides and a much higher count. It would appear, therefore, that the brecciation (related to the sedimentary characteristic of the host rock) may have controlled mineralization long before the fractures we now see were made.

Recent fractures probably play a minor role in that some of the uranium being freed today by weathering is being precipitated in them.

Origin of the Uranium

Among the people who have studied uranium and its occurrence there are many eminent and competent men, most of whom differ diametrically on the nature of the origin of any particular uranium deposit. But all of these men can usually see certain features about every deposit that fits their theory on how and why the ore was emplaced.

The geologic environment of the Red Hills occurrence is so complex that any theorist can find factors enough to satisfy his interpretation. Intrusions of several types, granitization, dikes, volcanics, circulating ground water and other factors are all there. The writer thinks that the probable explanation of the origin is very similar to the theory which has gained widest acceptance in the uranium industry on the origin of the Colorado Plateau deposits. This is essentially, that uranium leached from volcanic debris in sedimentary rocks by meteoric or other waters was concentrated by circulating ground waters into an environment suitable for the precipitation of the uranium ion. In the case of the uranium-bearing Shinarump and Morrison formations of the Colorado Plateau, the structures controlling the concentration and providing the favorable environment for precipitation are ancient stream channels eroded into the underlying formations.

The writer believes that a similar situation exists in the Red Hills vicinity. After the time of Permian deposition a long period of erosion took place which in some areas cut deep into paleozoic rocks. Such erosion undoubtedly produced channels. Cretaceous red silts, arkosic conglomerates, sandstones, siltstones and their limestones, all containing an important fraction of volcanic ejecta, were laid down on this old erosion surface. Uranium leached from the volcanics was concentrated downward and deposited in or near the base of the Cretaceous series. Channels cut in the underlying rocks could have influenced concentration here also.

Conclusions

Two thoughts should be kept in mind when deciding on what possibilities this deposit may have. One, to what extent do outcrop samples indicate the potential of a uranium deposit and what weight does industry as a whole put on such samples as compared with other geologic factors? Two, are there similar deposits whose history may serve as a guide to an appraisal?

Generally speaking, outcrop samples are now considered a secondary if not a small factor in determining the amount and extent of exploratory work to be done on a prospect. This is evidenced by the many thousands of claims which are being extensively drilled today which are miles from an outcrop and are only known to be over a formation which, in places, contains uranium. Such drilling has developed important ore bodies. Similarly, thoroughly leached channel outcrops in southeast Utah that contain little more than trace radioactivity have behind them ore bodies worth millions. Conversely, a good many outcrops under certain geologic conditions may have very good surface values but are only enriched at the surface and have no depth. It is the writer's conclusion that conditions in the Red Hills deposit would result in leaching, therefore, sample values mean little other than uranium is present.

The uranium host rock is a rather scarce type and the writer knows of only two other places where it has been found (naturally, it must exist in many places) and it has come to his attention because of its association with uranium. The other two places are in the Northern Territory of Australia, one at Dyson's deposit in Rum Jungle, and the other at Sleisbeck near Arnhem Land. In both instances, outcrop evidence of uranium was remarkably similar to the Red Hills occurrence. Outcrop radioactivity at Dyson's deposit was not as intense as that at the Red Hills deposit, yet a little stripping revealed an ore body in a nearby schist which was open pitted and yielded over $ 3,000,000.00 in ore with the end not in sight. In the instance of the Sleisbeck deposit, a little better in outcrop than the Red Hills outcrop, two hours of bulldozer work exposed an 11 foot bed of mineralization (5 feet of it over 2% U_3O_8) in shale which was entirely covered and next to the mineralized outcrop.

The best places to look for uranium are those in which the geologic environment is similar to the environment of known deposits. For this reason, it is worth considerable effort to test the uranium potential of the Red Hills deposit.

RECOMMENDATIONS

1. Make radiometric grid survey and geological map.

2. Bulldozer work - one week's work to dig trenches across the radiometric anomalies and to expose the geologic section in the vicinity.

3. Diamond core drilling (about 2 holes averaging 175') and gamma ray logging of holes - about 300' for geologic control and samples.

4. Wagon or air rotary drilling to develop ore if results of preceding work are encouraging. Cost of blocking out ore is relatively inexpensive with air drilling.

MF-103
(Revised April 1952)

DMEA
Date Rec'd
MAY 21 1956

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

RECEIVED
MAY 23 1956
BUREAU OF MINES
Denver, Colorado

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-4303
Metal or Mineral URANIUM
Date Received 5/23/56
Estimated Cost $7,100
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: Harold Raymond
15 Oakmont Drive
Los Angeles 49, California

(*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. Only an individual

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

(*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 Sheet #1 ref. No. 1

(*b*) State any mine name by which the property is known. Red Hills Uranium Deposit

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

(*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 None

(*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 REFERENCE #5 ON ATTACHED SHEETS FOR ANSWERS TO QUESTIONS 4-a, b, c, AND D.

(*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. See reference No. 4

16—66551-1

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore Uranium and any associated valuable minerals

(*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. See reference No. 5.

(*c*) The work will start within 60 days and be completed within 4 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 reference No. 6

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.).

(*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.

(*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.

(*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.

(*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.

(*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.

(*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 April 2, 1956

Harold P. Cyr
(Applicant)

By Harold P. Cyr

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

RECEIVED
MAY 2 3 1956

Harold Raymond
15 Oakmont Drive
Brentwood 24, Calif.

Ref. No. 1 to Item No. 3-A

The lands to be explored are Arizona State Mineral leases described in their books as follows:

Lease No. 11 511 (July 29, 1955)	Section	Township	Range	Acres
NE¼	6	16S	17E	40.00
N½NW¼	5	16S	17E	15.00
W½SW¼SW¼	"	"	"	55.00
Lease No. 11 505 (May 24, 1955)				
W½SW¼	5	16S	17E	31.20
S½NE¼	6	16S	17E	101.00
S½NW¼NE¼	"	"	"	
N½SW¼NE¼	"	"	"	133.00
			Total	376.00

These leases are between the State of Arizona Land Department and Bernard Hughes, Richard M. Hughes, James C. Kelley, and Clyde Jones, as lessee.

Ref. No. 2 to Item No. 4-A

The only work done on these leases has been that discovery work necessary to perfect the claims and consists only of discovery work in the form of pits.

A minor amount of trenching and pitting was done on "hot" spots before the owners acquired their funds. No conventional shafts, mining, nor drilling has been done. No mapping of the occurrence has been undertaken.

The deposit is easily accessible by good road. A conventional passenger car can be driven to within 30 yards of the main occurrence. Access requires driving about 8 miles off pavement on good gravelled road.

Ref. No. 3 to Item No. 4-A, B, C, and D.

See accompanying geologic report for detailed answers to all of these questions.

Ref. No. 4 to Item No. 4-E

Manpower, materials, & supplies are easily available in Tucson 26 miles distant. Water for drilling would have to be hauled about 2 miles, however, most drilling for testing can be done with air. Power lines are about six miles distant.

Ref. No. 5 to Item No. 5-B

The general program to be followed is outlined in the Recommendations part of the accompanying geologic report. (Fig. I)

The geology of the area will be mapped on aerial photographs and then a radiometric survey will be made to locate and outline the trends of anomalies.

The second stage of the project will consist of drilling two diamond drill holes, and possibly three, for information on lithology, mineralization, general structure, and to provide a guide for the interpretation of wagon drill cuttings.

At the time of diamond drilling some work will be done with a bulldozer to expose the surface geology where necessary and to give additional information on the radiometric anomalies.

Figure I illustrates the relation between the drill holes and the geology of the deposit. The writer has seen two instances where an almost identical geologic situation existed and the uranium was exposed the same way and related to identical rock types and a covered contact. It is believed, therefore, that the best possibilities for the occurrence of uranium is at the contact between the different rock types. The diamond drill holes shown on the cross section are located to test the mineral possibilities at the contact and to establish the geology.

Figure No. 2 is a sketch map of the areal geology showing the outcrops, contacts, and igneous intrusions. The location of the diamond drill holes. The general distribution of the wagon drill holes.

Reference No. 6 to Item No. 5-D

The applicant has had no mining experience but he has engaged Mr. Frank J. Frankovich, consulting geologist of Phoenix, Arizona to supervise all phases of the work from the original mapping through the drilling and logging, to the final report on the results of the project. Mr. Frankovich has the following background: B. S. Degree in Geological Engineering, 2 years experience on a miner, 14 years as a geologist with the Anaconda Copper Mining Company, 2 years as a geologist with the Arabian American Oil Company, 4 years as a geologist with the Atomic Energy Commission in Australia, New Zealand and the Colorado Plateau, 14 years as a consultant geologist in all parts of the U. S. and parts of Mexico. For the USAEC Mr. Frankovich did much reconnaissance work and also conducted a number of drilling and exploration projects. He also did geological reconnaissance and supervised structural drilling for the Arabian American Oil Company.

ESTIMATE OF COSTS

6-a	Independent Contractor:	
	Bulldozer - digging trenches across anomalies, preparing drill sites, exposing geologic section, 40 hours at $2.50 per hour and $200 moving charge.	$300
	Aerial photographs and base map at 200 feet per inch	300
	Diamond drilling at $5.00 per foot - 2 holes totaling 350 feet	1750
	Wagon Drilling at $2.00 per foot and 1075 feet	2150
6-b	Labor, supervision, and consultants.	
	Field geologists time and expenses for six weeks for radiometric survey (grid), geologic mapping, core logging, hole logging, sampling, surveying holes, and general supervision.	1000
	Supervising consultant geologist for planning supervision of field geologist, evaluation of results and and preparation of final report. Will make about six two-day trips to the project	750
6-c	Operating materials and supplies. Miscellaneous supplies flagging, stakes, sacks, etc.	100
6-d	Operating equipment. Rental of radiometric hole logging equipment $100, rental of surveying equipment $150	250
6-e	Rehabilitation and repairs. None	0
6-f	New buildings, improvements, installations. None	0
6-g	Miscellaneous. Fencing of pits for safety of livestock according to state law $200	200
6-h	Contingencies	100
		$7,000

RED HILLS URANIUM OCCURRENCE

26 MILES SE OF TUCSON, ARIZONA

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by

F. J. Frankovich

April 1955

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ABSTRACT

This significant uranium occurrence in a brecciated, thinly interbedded silicified shale and limestone of Cretaceous age has ore grade samples on the outcrop but only a ton or so of such material is exposed. Visible uranophane was found in surface rocks and assays up to 0.45% U_3O_8 have been obtained. The distribution of the mineralization is irregular and exposed in several pits and outcrops. The uranium at this time cannot be related to any specific geologic feature other than rock type, therefore, no estimate of ore reserves can be made nor can an accurate appraisal of its possibilities be made without drilling the deposit. The writer has seen two instances in the Northern Territory of Australia where multi-million dollar deposits were found under outcrops having no better surface indications than the Red Hills deposit. Moreover, the host rock in the two Australian deposits is the same as that in the Red Hills deposit. Experience indicates that the best places to look for uranium are those which are similar in geology to known deposits. For this reason, the cost of testing the Red Hills deposit is considered to be a good risk.

It is estimated that about $ ~~6,800~~ 7,100 spent on geological and radiometric surveying, bulldozing, core drilling and supervision is sufficient to test the deposit. However, if ore is discovered in this stage additional funds will be required to block it out with the relatively inexpensive methods of wagon or air-rotary drilling.

RED HILLS URANIUM OCCURRENCE

26 MILES SE OF TUCSON, ARIZONA

RECEIVED
MAY 23 1956

INTRODUCTION

Location and Accessibility

This uranium occurrence is located 26 miles southeast of Tucson, Arizona, and is easily accessible with ordinary automobile by taking U. S. Highway 80 southeast out of Tucson. Twenty miles out, turn northeast at Vail on the road marked by a sign "Colossal Cave." Take the left road of a fork about six miles out along this graded road; then proceed a few miles to the next cross-roads which will have a sign on the left reading "Colossal Cave." After making a right turn at this junction toward "Colossal Cave" and travelling 0.6 miles one can see another trail off to the left which after 300 yards will bring one on to the radioactive outcrop. The entire area of interest is accessible by pick-up truck and development of any kind would not require road building more costly than brush clearing with a bulldozer.

Topography

The uranium-bearing formation forms a low, rounded, rocky dissected ridge one mile long trending in a northwesterly direction. One half mile to the south and one-half mile to the east the terrain becomes very steep and impossible for the most part even to four wheel drive vehicles. The remaining terrain is of low relief and easily traversed.

History

No mining has ever been done in this area and no old prospect pits are to be seen.

Radioactivity was first found in the area by Clyde Jones and associates of southern California in February 1955, after they traced down a radioactive rock found in a little girl's rock collection in Lynwood, California. They immediately staked claims over and well beyond the area of interest, being

careful to abide by all the details of the law to perfect their claims, which are now indisputably valid. They need do no more work on them until June 30, 1956, to maintain their title.

No development work of consequence has been done other than the pits required by law. The substantial cost of these left the owners without funds for development.

REGIONAL GEOLOGY

The deposit is found at the southeastern base of the Santa Catalina Mountains (Sec. 6, T. 16 S., R. 17 E.). These northwest-trending ranges consist of pre-Cambrian schists and gneiss of various kinds with a nucleous of granite rocks. Overlying Paleozoic rocks occur extensively, especially on the north side, including shaly limestone with many Devonian fossils. Great masses of diorite penetrate the granite and overlying strata and some of the limestones in the latter are changed to marble.

Little structural deformation of paleozoic rocks took place until the Mesozoic era. There was, however, a long period of nondeposition and some faulting after Permian time and in some areas paleozoic rocks were deeply eroded before Cretaceous deposition. It is believed that the Rincon Valley vicinity was such an area where Cretaceous sediments lie on Naco (Pennsylvanian) limestone.

After Cretaceous sediments were laid down, wide-spread and diverse intrusive activity took place. Intrusion was accompanied by faulting and followed by thrust faulting.

GEOLOGY OF THE MINERAL DEPOSIT

Stratigraphy at the Deposit

The stratigraphy in the vicinity of the deposit is obscured by cover, faulting and the intrusion of diabase and andesite into the sediments. No contacts are visible. Fortunately, however, one limestone outcrop under the uranium-bearing bed was found to contain fossils which date it as the Naco limestone of Pennsylvanian Age. This in turn dates the younger, uranium-bearing bed as possible Permian and probable Cretaceous.

A very generalized approximation of the section is set forth below from top to bottom:

Thickness	Rock Type
	Alluvium and diabase intrusion
50' plus	Dark limestone with gnarled and brecciated cherty bands.
50'	Sub-rounded boulder and pebble arkosic conglomerate with coarse particles of all types and of deep red color interbedded with green, red, purple silt and sandstones with some lime content.
80'	Covered
40'	Fine-grained pink and gray arkosic, in part a granular conglomerate, partially granitized.
90'	Thinly interbedded silicified white to gray shale with slightly ferruginous, red limestone, which, as the result of dynamic metamorphism, has the appearance of a white, angular, cherty breccia in a dark matrix. This member contains uranium and other metallic sulphides and forms a long, low, dissected prominent ridge.
85'	Covered except for pit which exposes soft, silty, bentonitic (?), pink and gray mudstone with dip fonformable with upper conglomerate.
40'	White, crystalline limestone with Pennsylvanian age fossils and of indeterminate thickness underlain by a dark blue limestone with sparse, thin, broken cherty laminae near base, which increase in size and number upward in the member. This limestone takes on, near the top, the appearance of the brecciated limestone about 85' above.
70'	Covered.
---	Diabase and granite.

Igneous Rocks

Diabase and nadesite intrusions abound in the area. Diabase underlies the lower limestone and is found all around the sediments described. Andesitic masses irregularly intrude the entire area.

The writer believes that volcanic ejecta are important constituents in all the section described except the limestones.

Structure

Rather complex faulting and folding in the region make clear interpretation of the structure impossible without much detailed mapping. The uranium-bearing bed is in a down-dropped, southwest tilted block of sediments. To the northeast, northwest, and southwest of the block is found a complex of pre-Cambrian granite and later diabase and andesite intrusions. Southeast of the block Cambrian and later rocks are lifted high above the younger rocks in the down-dropped block. At least 5 southwest striking faults off-set the northerly strike of the uranium-bearing formation. Significant additional detail on the structure cannot be had until drilling and detailed surface stripping have been done.

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Finely disseminated sulphides are visible but the metallic minerals are largely sub-macroscope. In one specimen the author observed a small number of minute crystals which appear to be torbernite. The U. S. Bureau of Mines at Tucson made a binocular microscope study of the minerals and reports that uranophane (a uranium silicate), pyrite, and magnetite are present in the rock. It is the writer's opinion that very fine-grained uraninite is present in the rock also, because of all the considerable "count" contained in the rock emanated from such secondary minerals as uranophane, they would be conspicuously visible.

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Sample values up to .45% U_3O_8 have been obtained representing several square feet of wall in a pit. A number of different and similar spots in two pits about 300' apart will assay 0.12 to 0.2% U_3O_8. A third pit, 50' off the line of the other two will assay about 0.08% over an 18" width.

Leaching of the outcrop probably has taken place, particularly if the elements necessary to form insoluble uranium minerals were not present in the host rock. For instance, if abundant phosphate was in the host rock any uranium in the vicinity would be fixed and stay in place as insoluble uranium-phosphate minerals such as autunite, or torbernite if copper were also present. Uranium minerals generally are highly soluble in either slightly acid or basic waters and the leaching of outcrops is a common result.

The random location of the pits and the lack of systematic trenching makes an estimation of grade and tonnage impossible. The samples are truly significant only in proving that uranium is present and that mineralizing solutions could well have produced ore bodies in the vicinity.

Mineralization Controls

At first sight it appears that the best mineralization is found in zones of greater fracturing because in several instances this is true. Close inspection, however, reveals that some zones of intense fracturing contain high count in one part of a pit but are pretty "dead" in another part of the pit a few feet away. In other instances high count is found in solid rock near highly fractured zones which are "dead."

Nevertheless, it can be seen in some large specimens exhibiting a dense non-brecciated rock adjacent to a well-cemented brecciated zone of similar rock type, that the brecciated zone only contains visible sulphides and a much higher count. It would appear, therefore, that the brecciation (related to the sedimentary characteristic of the host rock) may have controlled mineralization long before the fractures we now see were made.

Recent fractures probably play a minor role in that some of the uranium being freed today by weathering is being precipitated in them.

Origin of the Uranium

Among the people who have studied uranium and its occurrence there are many eminent and competent men, most of whom differ diametrically on the nature of the origin of any particular uranium deposit. But all of these men can usually see certain features about every deposit that fits their theory on how and why the ore was emplaced.

The geologic environment of the Red Hills occurrence is so complex that any theorist can find factors enough to satisfy his interpretation. Intrusions of several types, granitization, dikes, volcanics, circulating ground water and other factors are all there. The writer thinks that the probable explanation of the origin is very similar to the theory which has gained widest acceptance in the uranium industry on the origin of the Colorado Plateau deposits. This is essentially, that uranium leached from volcanic debris in sedimentary rocks by meteoric or other waters was concentrated by circulating ground waters into an environment suitable for the precipitation of the uranium ion. In the case of the uranium-bearing Shinarump and Morrison formations of the Colorado Plateau, the structures controlling the concentration and providing the favorable environment for precipitation are ancient stream channels eroded into the underlying formations.

The writer believes that a similar situation exists in the Red Hills vicinity. After the time of Permian deposition a long period of erosion took place which in some areas cut deep into paleozoic rocks. Such erosion undoubtedly produced channels. Cretaceous red silts, arkosic conglomerates, sandstones, siltstones and their limestones, all containing an important fraction of volcanic ejecta, were laid down on this old erosion surface. Uranium leached from the volcanics was concentrated downward and deposited in or near the base of the Cretaceous series. Channels cut in the underlying rocks could have influenced concentration here also.

Conclusions

Two thoughts should be kept in mind when deciding on what possibilities this deposit may have. One, to what extent do outcrop samples indicate the potential of a uranium deposit and what weight does industry as a whole put on such samples as compared with other geologic factors? Two, are there similar deposits whose history may serve as a guide to an appraisal?

Generally speaking, outcrop samples are now considered a secondary if not a small factor in determining the amount and extent of exploratory work to be done on a prospect. This is evidenced by the many thousands of claims which are being extensively drilled today which are miles from an outcrop and are only known to be over a formation which, in places, contains uranium. Such drilling has developed important ore bodies. Similarly, thoroughly leached channel outcrops in southeast Utah that contain little more than trace radioactivity have behind them ore bodies worth millions. Conversely, a good many outcrops under certain geologic conditions may have very good surface values but are only enriched at the surface and have no depth. It is the writer's conclusion that conditions in the Red Hills deposit would result in leaching, therefore, sample values mean little other than uranium is present.

The uranium host rock is a rather scarce type and the writer knows of only two other places where it has been found (naturally, it must exist in many places) and it has come to his attention because of its association with uranium. The other two places are in the Northern Territory of Australia, one at Dyson's deposit in Rum Jungle, and the other at Sleisbeck near Arnhem Land. In both instances, outcrop evidence of uranium was remarkably similar to the Red Hills occurrence. Outcrop radioactivity at Dyson's deposit was not as intense as that at the Red Hills deposit, yet a little stripping revealed an ore body in a nearby schist which was open pitted and yielded over $ 3,000,000.00 in ore with the end not in sight. In the instance of the Sleisbeck deposit, a little better in outcrop than the Red Hills outcrop, two hours of bulldozer work exposed an 11 foot bed of mineralization (5 feet of it over 2% U_3O_8) in shale which was entirely covered and next to the mineralized outcrop.

The best places to look for uranium are those in which the geologic environment is similar to the environment of known deposits. For this reason, it is worth considerable effort to test the uranium potential of the Red Hills deposit.

RECOMMENDATIONS

1. Make radiometric grid survey and geological map.

2. Bulldozer work - one week's work to dig trenches across the radiometric anomalies and to expose the geologic section in the vicinity.

3. Diamond core drilling (about 2 holes averaging 175') and gamma ray logging of holes - about 300' for geologic control and samples.

4. Wagon or air rotary drilling to develop ore if results of preceding work are encouraging. Cost of blocking out ore is relatively inexpensive with air drilling.

ASSIGNMENT OF INTEREST IN MINING LEASE

ASSIGNMENT executed on this _____ day of March, 1956, between RICHARD WM. HUGHES, as Assignor, and HAROLD RAYMOND, as Assignee.

W I T N E S S E T H:

WHEREAS, a Mining Lease was made and entered into on the 24th day of May, 1955, by and between STATE LAND DEPARTMENT of the State of Arizona, as Lessor, and BERNARD HUGHES, RICHARD WM. HUGHES, JAMES C. KELLEY and CLYDE JONES, as Lessee, under Lode Lease No. MIN-505, covering certain mining property in the State of Arizona, consisting of eight (8) Mining Claims known as Red Hills Mining Claims 1 through 8 inclusive, and

WHEREAS, RICHARD WM. HUGHES is desirous of assigning all of his right, title and interest in and to said Mineral Lease to HAROLD RAYMOND, and

WHEREAS, HAROLD RAYMOND is desirous of accepting such assignment of all of the said interest of said RICHARD WM. HUGHES in and to said Mineral Lease.

NOW, THEREFORE, in consideration of the sum of SIX HUNDRED DOLLARS ($600.00) and other good and valuable consideration, receipt of which is hereby acknowledged, the parties hereto agree as follows:

1. RICHARD WM. HUGHES does hereby bargain, sell, transfer, assign, convey and set over unto HAROLD RAYMOND all of his right, title and interest in and to that certain Mineral Lease dated May 24, 1955 by and between the STATE LAND DEPARTMENT of the State of Arizona, as Lessor, and BERNARD HUGHES, RICHARD WM. HUGHES, JAMES C. KELLEY and CLYDE JONES, as Lessee, which said Lease is a Lode type lease under Lease No. MIN-505, together with all personal property used or obtained in connection therewith.

2. The parties hereto agree that this Assignment and all of its

terms and conditions shall extend to and be binding upon the parties hereto, their, and each of their, respective heirs, devisees, legatees, executors, administrators, grantees, successors and assigns.

IN WITNESS WHEREOF, the parties hereto have executed this Assignment in duplicate the day and year first above written at _____, Arizona.

ASSIGNOR:

_____

RICHARD WM. HUGHES

ASSIGNEE:

_____

HAROLD RAYMOND

STATE OF ARIZONA)
) ss.
County of _____)

On the _____ day of _____, 1956, before me the undersigned, a Notary Public, in and for said County and State, personally appeared RICHARD WM. HUGHES, known to me to be the person whose name is subscribed to the within Instrument as Assignor and acknowledged to me that he executed the same.

IN WITNESS my hand and official seal.

_____
Notary Public in and for the County
of _____ State of Arizona.

STATE OF CALIFORNIA)
) ss.
County of Los Angeles)

On the _____ day of _____, 1956, before me the undersigned, a Notary Public, in and for said County and State personally appeared HAROLD RAYMOND, known to me to be the person whose name is subscribed to the within Instrument as Assignee and acknowledged to me that he executed the same.

IN WITNESS my hand and official seal.

_____
Notary Public in and for the County
of Los Angeles, State of California.

ASSIGNMENT OF INTEREST IN MINING LEASE

RECEIVED

ASSIGNMENT executed on this _____ day of March, 1956, between BERNARD HUGHES, as Assignor, and HAROLD RAYMOND, as Assignee.

W I T N E S S E T H :

WHEREAS, a Mineral Lease was made and entered into on the 24th day of May, 1955, by and between STATE LAND DEPARTMENT of the State of Arizona, as Lessor, and BERNARD HUGHES, RICHARD WM. HUGHES, JAMES C. KELLEY and CLYDE JONES, as Lessee, under Lode Lease Number MIN-505, covering certain mining property in the State of Arizona, consisting of eight (8) Mining Claims, and

WHEREAS, BERNARD HUGHES is desirous of assigning all of his right, title and interest in and to said Mineral Lease to HAROLD RAYMOND, and

WHEREAS, HAROLD RAYMOND is desirous of accepting such assignment of all of the said interest of said BERNARD HUGHES in and to said Mineral Lease.

NOW, THEREFORE, in consideration of the sum of of SEVEN HUNDRED DOLLARS ($700.00) and other good and valuable consideration, receipt of which is hereby acknowledged, the parties hereto agree as follows:

1. BERNARD HUGHES does hereby bargain, sell, transfer, assign, convey and set over unto HAROLD RAYMOND all of his right, title and interest in and to that certain Mineral Lease dated May 24, 1955 by and between the STATE LAND DEPARTMENT of the State of Arizona, as Lessor, and BERNARD HUGHES, RICHARD WM. HUGHES, JAMES C. KELLEY and CLYDE JONES, as Lessee, which Lease is a Lode type lease under Lease Number MIN-505, together with all personal property used or obtained in connection therewith.

2. The parties hereto agree that this Assignment and all of

its terms and conditions shall extend to and be binding upon the parties hereto, and their, and each of their, respective heirs, devisees, legatees, executors, administrators, grantees, successors and assigns.

IN WITNESS WHEREOF, the parties hereto have executed this Assignment in duplicate on the day and year first above written at Alameda, California.

ASSIGNOR:

BERNARD HUGHES

ASSIGNEE:

HAROLD RAYMOND

I, BARBARA HUGHES, wife of BERNARD HUGHES, Assignor in the above Assignment, do hereby consent to said Assignment.

BARBARA HUGHES

STATE OF CALIFORNIA)
) ss.
County of Alameda)

On the _____ day of _____, 1956, before me the undersigned, a Notary Public, in and for said County and State, personally appeared BERNARD HUGHES, known to me to be the person whose name is subscribed to the within Instrument as Assignor and acknowledged to me that he executed the same.

IN WITNESS my hand and official seal.

Notary Public in and for the County of Alameda, State of California.

STATE OF CALIFORNIA)
) ss.
County of Los Angeles)

On the _____ day of _____, 1956, before me the undersigned, a Notary Public, in and for said County and State personally appeared HAROLD RAYMOND, known to me to be the person whose name is subscribed to the within Instrument as Assignee and acknowledged to me that he executed the same.

IN WITNESS my hand and official seal.

Notary Public in and for the County of Los Angeles, State of California.

STATE OF CALIFORNIA)
)ss.
County of Alameda)

On the _____ day of _____, 1956, before me the undersigned, a Notary Public, in and for said County and State personally appeared BARBARA HUGHES, known to me to be the person whose name is subscribed to the within Consent to Assignment and acknowledged to me that she executed the same.

IN WITNESS my hand and official seal.

Notary Public in and for the County of Alameda, State of California.

LAW OFFICES OF
SMITH & WILSON
8943 WILSHIRE BOULEVARD
BEVERLY HILLS, CALIFORNIA
BRADSHAW 2-5489

DMET
Date Rec'd
MAY 21 1956
BUREAU OF MINES
Denver, Colorado

A G R E E M E N T

AGREEMENT made and entered this _____ day of March, 1956, by and between HAROLD RAYMOND, referred to as "First Party", and JAMES C. KELLEY and CLYDE JONES, referred to as "Second Parties".

W I T N E S S E T H:

WHEREAS, First Party is in the process of acquiring an undivided sixty percent (60%) interest in and to those certain Mineral Leases covering certain mining properties in the State of Arizona, which said Mineral Leases are Lode type Mineral Leases described as:

1. Mineral Lease Number MIN-511 dated July 29, 1955, by and between the State Land Department of the State of Arizona, as Lessor, and BERNARD HUGHES, JAMES C. KELLEY and CLYDE JONES, as Lessee.

2. Mineral Lease Number MIN-505 dated May 24, 1955, by and between the State Land Department of the State of Arizona, as Lessor and BERNARD HUGHES, RICHARD WM. HUGHES, JAMES C. KELLEY and CLYDE JONES, as Lessee, and

WHEREAS, Second Parties are presently owners of an undivided forty percent (40%) between themselves of the said Mineral Leases, and

WHEREAS, the parties hereto desire to expedite operations of the aforesaid leaseholds, and the operations required under the terms of the said leases,

NOW, THEREFORE, in consideration of the premises, covenants and conditions herein contained, the parties agree as follows:

(1) The parties agree, as hereinafter set forth, to mine said properties, carry on a development program simultaneously with the mining, and to cooperate in carrying out all of the provisions of said Mineral Leases, as above set forth.

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8943 WILSHIRE BOULEVARD
BEVERLY HILLS, CALIFORNIA
BRADSHAW 2-5489

2. It is agreed that First Party shall solely supervise and manage the operations performed under the terms hereof, although he may from time to time request advice from Second Parties.

3. All expenditures shall be borne by First Party, however, he shall be sole judge of what expenditures are to be made.

(a) It is further agreed that all expenditures made by First Party under the terms hereof shall be repaid out of the first monies that may be earned from the sale of minerals under the operation of the said mining properties.

(b) It is further agreed that the parties hereto shall each bear his proportionate share of taxes on the leaseholds.

4. First Party agrees to use his best efforts in managing and supervising the operation of the said leasehold properties.

5. First Party agrees to deliver to Second Parties a quarterly financial report, together with a statement of all bills paid by him.

6. It is agreed between the parties that the net profits of the operations herein contemplated shall be distributed betwen the parties as their, and each of their ownership interests may be as to ownership in the leaseholds, net profits for the purposes of this Agreement shall be defined to be those as determined under normal business accounting practices.

7. This Agreement shall be for a term of _____ years.

8. This Agreement may be terminated by First Party if after expending money and time he determines that the operation of the properties is not commercially feasible. First Party may so terminate this Agreement upon giving thirty (30) days written notice of termination to Second Parties. It is further agreed that should First Party so terminate this Agreement then he shall be entitled to no return of monies expended by him from Second

Parties, except that should the leaseholds be sold he shall receive such sums as expended hereunder from the proceeds of such sale before division of the balance of the sale monies between the parties as their interests may appear.

9. For the purposes of this Agreement the mailing addresses for each party for all accounts, notices, and other matters herein contemplated shall be:

Harold Raymond	15 Oakmont Drive Los Angeles 49, California
James C. Kelley	5021 Tenaya Avenue South Gate, California
Clyde Jones	13719 Flatbush Norwalk, California

10. Upon the termination of this Agreement, except as provided in paragraph 8, the parties shall settle their accounts and then distribute the equipment and other assets acquired under the term hereof, as their ownership interests may appear in and to the leaseholds.

11. It is understood and agreed that the parties shall endeavor to obtain a loan under the auspices of the Atomic Energy Commission to develope the said Mineral Leaseholds properties.

12. It is expressly understood and agreed that all shipments and sale of uranium, and other ore, may be in the names of all the parties hereto, and it is agreed that First Party is fully authorized to take and transport and sell all uranium ore, or other ore, or related or unrelated substances, as the same is so transported and taken to the buying stations without segregating each parties undivided portion thereof.

13. Any and all Insurance Policies or bonds that may be taken out on the operations contemplated hereunder shall name all parties hereto as insureds.

13. This Agreement shall bind the parties hereto and inure to the benefit of their respective heirs, devisees, legatees,

assigns, successors in interest, executors, administrators and personal representatives.

Executed in triplicate the day and year first above written at Beverly Hills, California.

FIRST PARTY:

Harold Raymond

SECOND PARTIES:

James C. Kelley

Clyde Jones

RECEIVED
MAY 2 1956

ASSIGNMENT OF INTEREST IN MINING LEASE

ASSIGNMENT executed on the _____ day of March, 1956, between BERNARD HUGHES, as Assignor, and HAROLD RAYMOND, as Assignee.

W I T N E S S E T H :

WHEREAS, a Mineral Lease was made and entered into on the 29th day of July, 1955, by and between the STATE LAND DEPARTMENT of the State of Arizona, as Lessor, and BERNARD HUGHES, JAMES C. KELLEY, and CLYDE JONES, as Lessee, under Lode Lease Number 511, covering certain mining property in the State of Arizona, consisting of three (3) Mining Claims, and

WHEREAS, BERNARD HUGHES is desirous of assigning all of his right, title and interest in and to said Mineral Lease to HAROLD RAYMOND, and

WHEREAS, HAROLD RAYMOND is desirous of accepting such Assignment of all of the said interest of said BERNARD HUGHES in and to said Mineral Lease.

NOW, THEREFORE, in consideration of the sum of THREE HUNDRED DOLLARS ($300.00) and other good and valuable consideration, receipt of which is hereby acknowledged, the parties hereto agree as follows:

1. BERNARD HUGHES does hereby bargain, sell, transfer, assign, convey and set over unto HAROLD RAYMOND all of his right, title and interest in and to that certain Mineral Lease dated July 29, 1955 by and between the STATE LAND DEPARTMENT of the State of Arizona, as Lessor, and BERNARD HUGHES, JAMES C. KELLEY, and CLYDE JONES, as Lessee, which said Lease is a Lode type lease under Lease Number MIN-511.

2. The parties hereto agree that this Assignment and all of

its terms and conditions shall extend to and be binding upon the parties hereto, and their, and each of their, respective heirs, devisees, legatees, executors, administrators, grantees, successors and assigns.

IN WITNESS WHEREOF, the parties hereto have executed this Assignment in duplicate on the day and year first above written at Alameda, California.

ASSIGNOR:

BERNARD HUGHES

ASSIGNEE:

HAROLD RAYMOND

I, BARBARA HUGHES, wife of BERNARD HUGHES, Assignor in the above Assignment, do hereby consent to said Assignment.

BARBARA HUGHES

STATE OF CALIFORNIA)
) ss.
County of Alameda)

On the _____ day of _____, 1956, before me the undersigned, a Notary Public, in and for the said County and State, personally appeared BERNARD HUGHES, known to me to be the person whose name is subscribed to the within Instrument as Assignor and acknowledged to me that he executed the same.

IN WITNESS my hand and official seal.

_____
Notary Public in and for the County of Alameda, State of California.

STATE OF CALIFORNIA)
) ss.
County of Los Angeles)

On the _____ day of _____, 1956, before me the undersigned, a Notary Public, in and for the County and State personally appeared HAROLD RAYMOND, known to me to be the person whose name is subscribed to the within Instrument as Assignee and acknowledged to me that he executed the same.

IN WITNESS my hand and official seal.

_____
Notary Public in and for the County of Los Angeles, State of California.

STATE OF CALIFORNIA)
) ss.
County of Alameda)

On the ____ day of _____, 1956, before me the undersigned, a Notary Public, in and for said County and State personally appeared BARBARA HUGHES, known to me to be the person whose name is subscribed to the within Consent to Assignment and acknowledged to me that she executed the same.

IN WITNESS my hand and official seal.

_____
Notary Public in and for the County of Alameda, State of California.

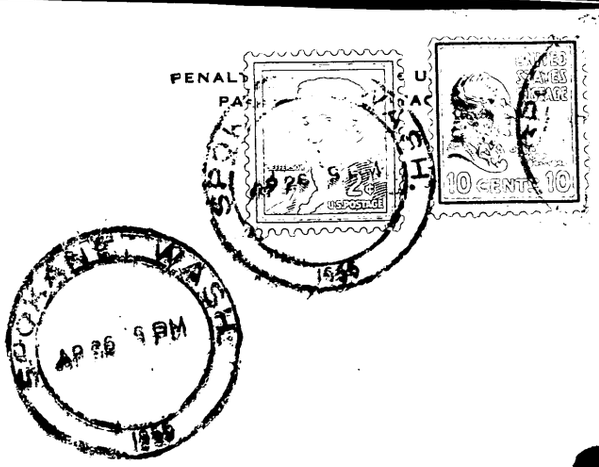
LAW OFFICES OF
SMITH & WILSON
8943 WILSHIRE BOULEVARD
BEVERLY HILLS, CALIFORNIA
BRADSHAW 2-5489

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

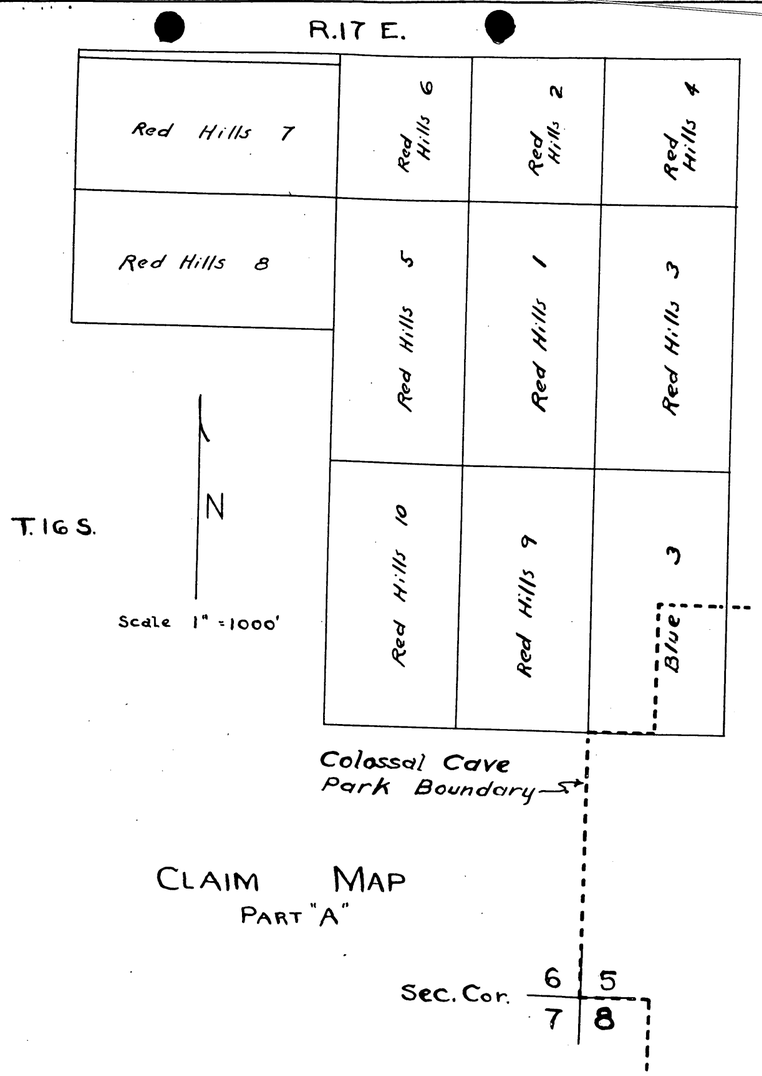
OFFICIAL BUSINESS

U. S. GEOLOGICAL SURVEY
SOUTH 157 HOWARD ST.
SPOKANE 4, WASHINGTON

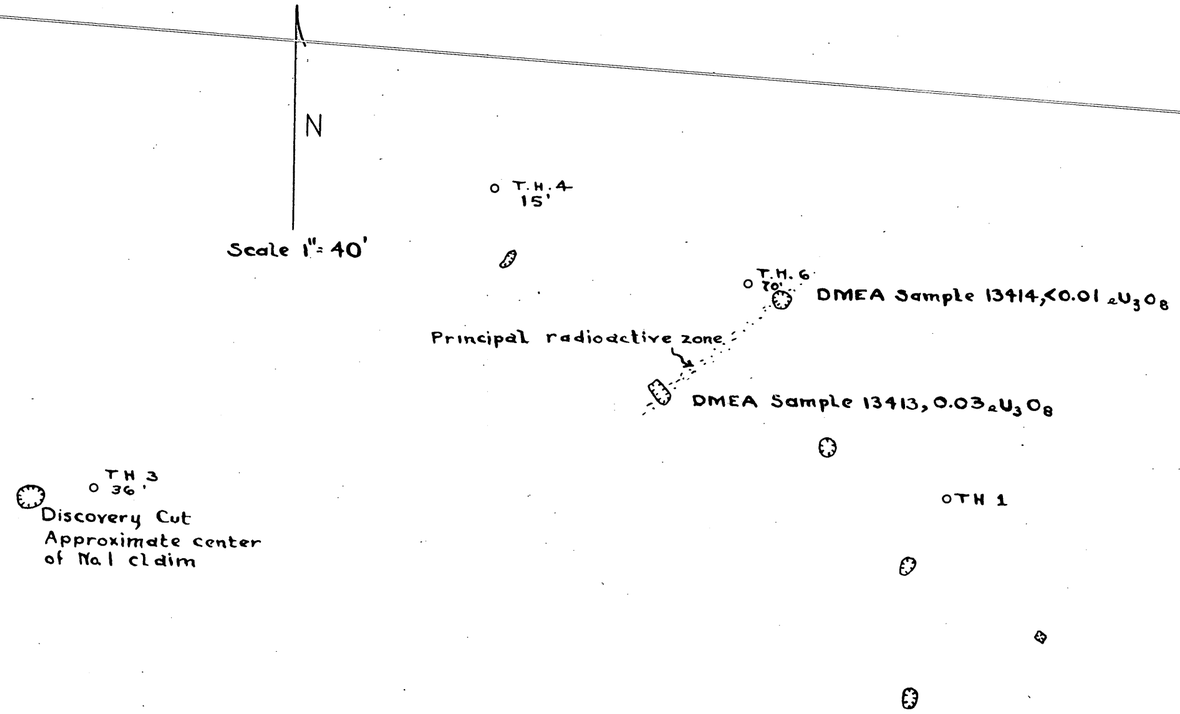
PENALTY FOR PRIVATE USE, $300



Mr. George C. Selfridge
Chairman, Operating Committee
Defense Minerals Explor. Admin.
Department of the Interior
Washington 25, D. C.



CLAIM MAP
PART "A"



SKETCH OF PROSPECTS ON RED HILL NUMBER 1 CLAIM
PART "B"

FIG. 1, SKETCH MAP OF RED HILLS URANIUM PROSPECTS, DMEA 4303

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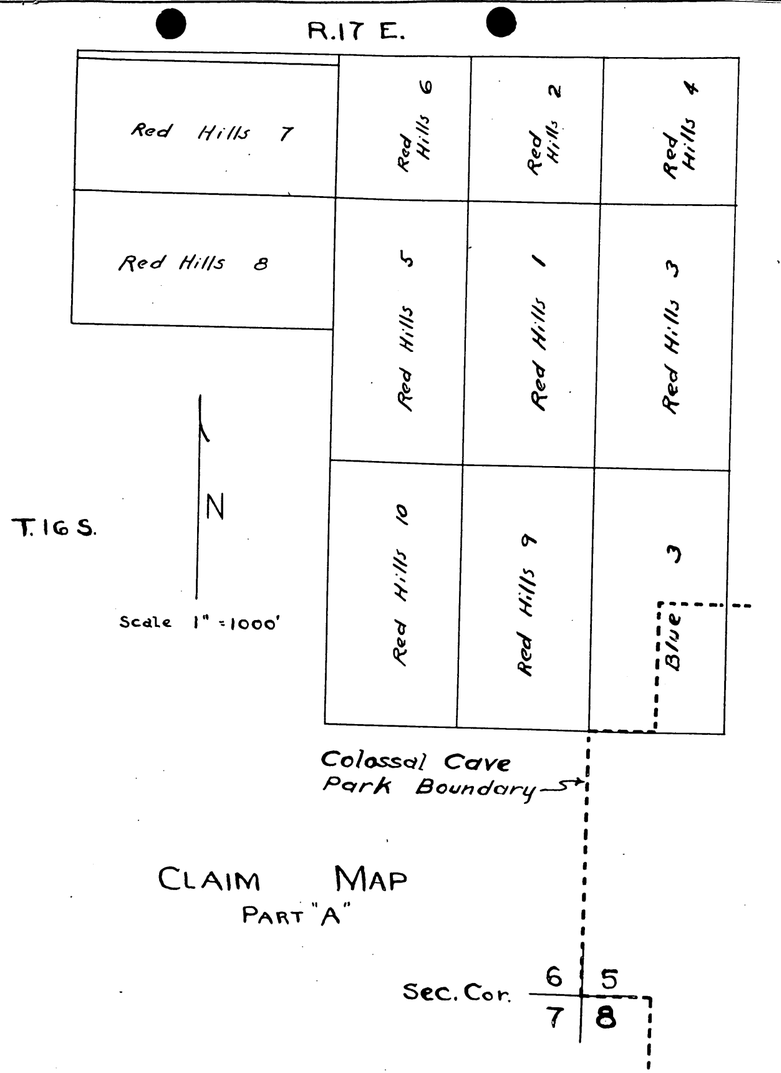
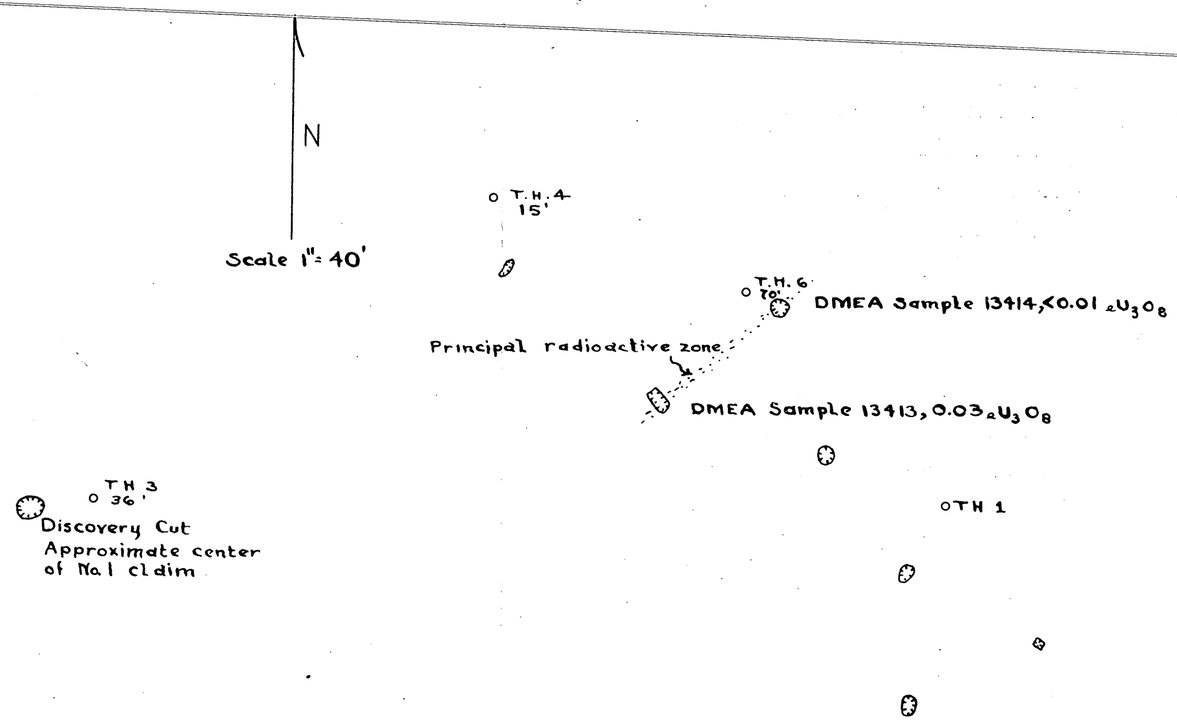


CLAIM MAP
PART "A"



SKETCH OF PROSPECTS ON RED HILL NUMBER 1 CLAIM
PART "B"

FIG. 1, SKETCH MAP OF RED HILLS URANIUM PROSPECTS, DMEA 4303

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SEP 10 1956

SKETCH MAP OF THE RED HILLS URANIUM OCCURRENCE

Scale approximately 3inches to one mile

Figure 2

SKETCH MAP OF THE RED HILLS URANIUM OCCURRENCE

Scale approximately 3inches to one mile

Figure 2

RECEIVED
MAY 23 1956

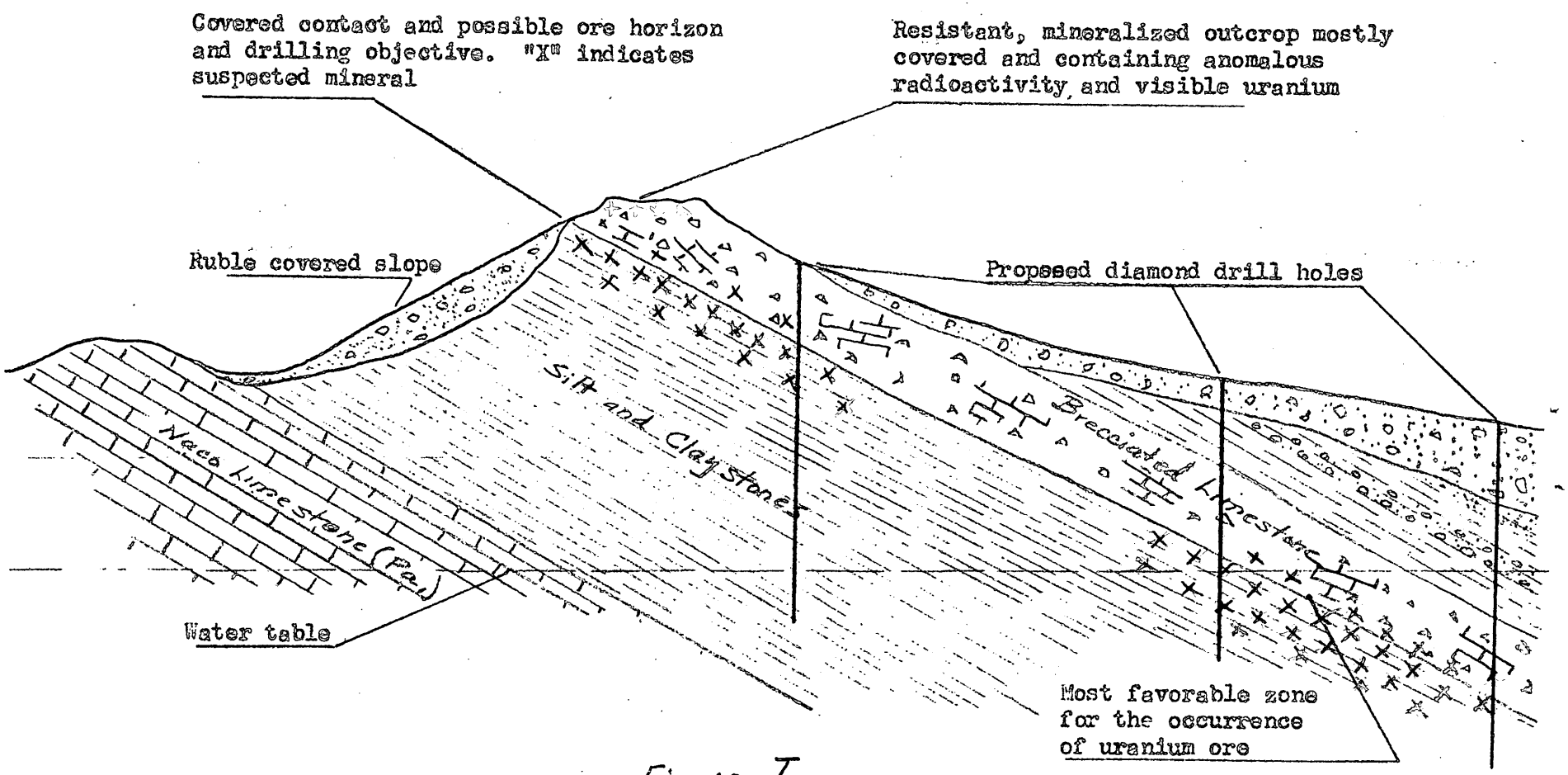


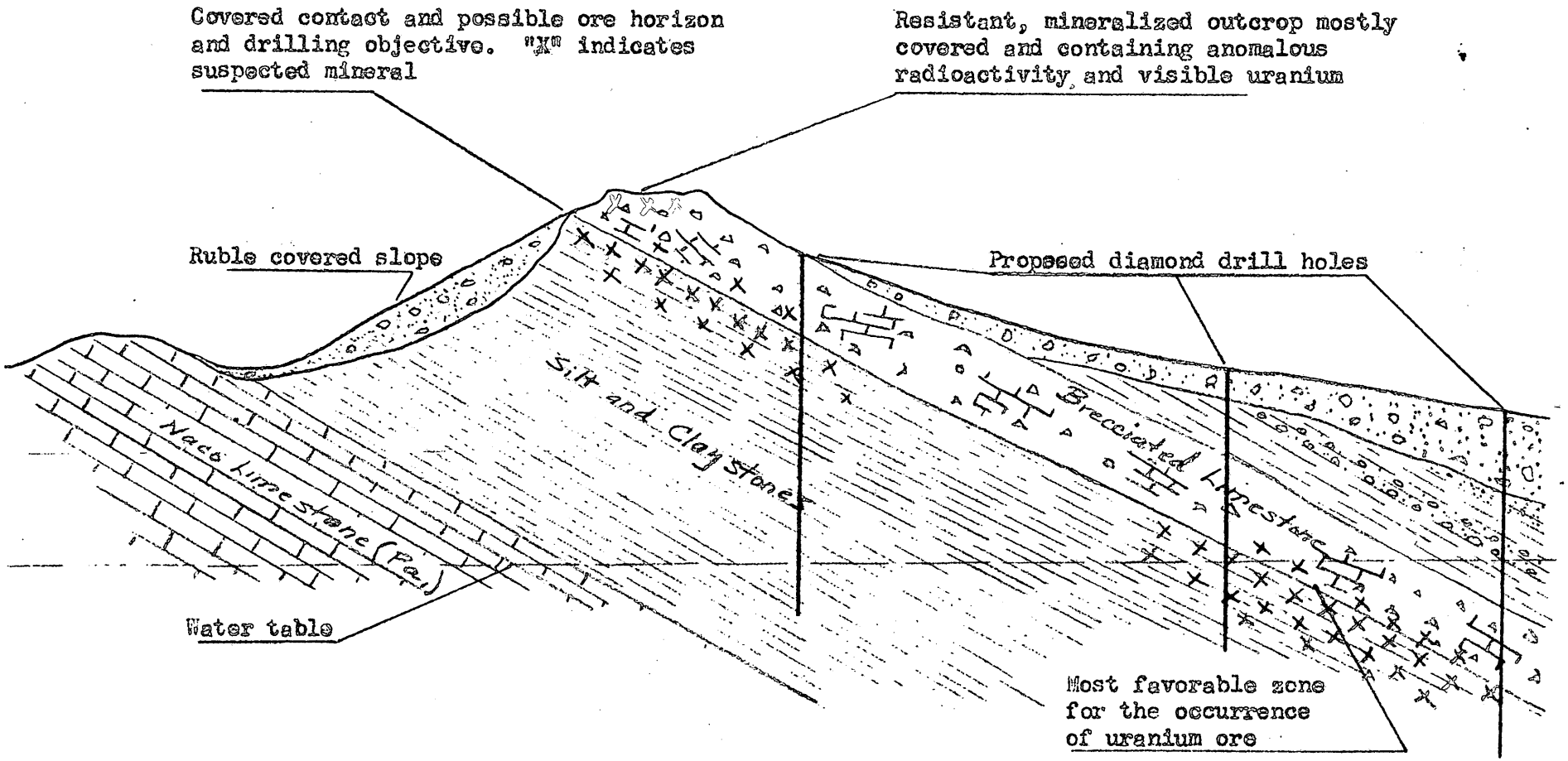
Figure I

DIAGRAMMATIC GEOLOGIC CROSS SECTION ACROSS

SUBJECT LEASES

Width of about one mile represented showing general nature of rock types found and drilling objectives.

Figure 1



DIAGRAMMATIC GEOLOGIC CROSS SECTION ACROSS

SUBJECT LEASES

Width of about one mile represented showing general nature of rock types found and drilling objectives.

Figure 1