5/31/55 glo

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

224 New Customhouse
Denver 2, Colorado

May 24, 1955

Memorandum

To: Chairman of the Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Report of Examination, DMEA Docket 3588 (Uranium), North West Development Co., (Lone B group of claims), Garfield County, Utah

Enclosed are the original and three copies of the report pertaining to the above application.

We concur in the recommendation of the field examiners that the application be denied.

W. M. Traver

W. M. Traver

E. N. Harshman

E. N. Harshman

Enclosures

6-6-55
Am

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

RECEIVED
JUN - 3 1955

224 New Customhouse
Denver 2, Colorado

May 31, 1955

Memorandum

To: Chairman of the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3588 (Uranium), North West Development Company, Lone B claims, Garfield County, Utah

Enclosed are the original and three copies of a separate section, Summary, Conclusions and Recommendations pertaining to the Report of Examination which was forwarded your office May 25, 1955.

Will you please attach a copy of the Summary, Conclusions and Recommendations to each copy of your report.

W. M. Traver

W. M. Traver

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE JUN 3 1955

REFERRED TO:

1. ~~700~~
2. Mr. Ellis
3.
4.

FOR:

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

REMARKS:

Region IV Del.

Check (X) before the items needing attention.

ROBERT E. ADAMS

Initials of sender.

GPO 16—63815-1

RECEIVED
JUN - 3 1955

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By E. S. Davidson and W. E. Young

North West Development Co., a partnership, has applied for DMEA assistance in exploring uranium property in the Circle Cliffs area, Garfield County, Utah. The applicant has requested funds, under docket No. DMEA-3588, to explore the Lone B group of five unpatented lode claims. The proposed exploration consists of 10,000 feet of wagon drilling, estimated by the applicant to cost $15,500.

The Lone B claims cover a mesa of gently dipping beds of Triassic Shinarump conglomerate. The full thickness of the formation and the top of the underlying Moenkopi formation are exposed in a narrow canyon cut into a northeast-trending fault zone. East of the Lone B claims, the base of the Shinarump is exposed in an erosional escarpment. Evidence of channeling at the top of the Moenkopi can be noted in the cliff exposures. Two adits driven on the south flank of a westward-trending channel follow the Shinarump-Moenkopi contact. Uranium mineralization encountered in this area is associated with carbonaceous trash in the sandstone. Radioactivity is confined principally to the lower 2 feet of the Shinarump sandstone. The small ore-grade bodies occur in a 3- to 6-inch zone above the Moenkopi-Shinarump contact.

The examiners do not believe the Lone B claims have sufficient merit to warrant Government participation in exploration. Rim stripping

and underground work completed to date have disclosed only small, erratically distributed bodies of uranium-bearing sandstone. It is believed that further exploration will not result in discovery of significant uranium mineralization, and it is therefore recommended that the lean request be denied.

TRANSMITTED
MAY 24 1955
DMEA
Date Recd
MAY 6 1955
BUREAU OF MINES
Denver, Colorado

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
1600 EAST FIRST SOUTH STREET
SALT LAKE CITY 1, UTAH

May 4, 1955

Memorandum

To: W. M. Traver, Executive Officer, DMEA Field Team, Region III

From: Stephen R. Wilson

Subject: Docket No. DMEA-3528 (Uranium), North West Development Co., Garfield County, Utah

Enclosed are the original and 10 copies of an engineering report pertaining to examination of the subject uranium property. W. E. Young conducted the examination and prepared the report. A copy of the brochure is also attached.

The applicant has requested a loan of $15,500 to explore the Lone B group of claims by wagon drill holes. Mineralization on the property occurs at the base of the Shinarump formation. Exploratory work completed to date has resulted in discovery of small, low-grade ore bodies. In view of the unfavorable results obtained from the initial exploration, the examining engineer concludes that Government participation in additional work is not warranted. He therefore recommends that the loan request be denied. I concur in this recommendation.

The property has been discussed with members of the Atomic Energy Commission.

Stephen R. Wilson
Stephen R. Wilson

Enclosure

cc: J. B. Clemmer

BLACK WEST DEVELOPMENT CO.
GARFIELD COUNTY, UTAH
DMRA-3583
Uranium

Engineering Report

By W. E. Young
Mining Engineer
Bureau of Mines

TRANSMITTED
MAY 24 1955

SUMMARY

Field examination of the Lone S group of claims, North West Development Co., Garfield County, Utah, disclosed low-grade uranium mineralization in scattered occurrences in the basal Shinarump formation. Exploratory work completed by the applicant consists of drifting in two locations, 120 feet and 86 feet respectively, and a small amount of rim sluigging. No sizable ore bodies were disclosed as a result of the work. Additional work proposed by the applicant is designed to further test the property by vapor drilling. As proposed, it consists of 100 holes spaced at varying intervals to cover the five claims. In view of the unfavorable results obtained by the initial work, it is considered that additional work is not justified.

INTRODUCTION

Property of the North West Development Co., known as the Jack Little property, was examined April 6, 1955 by a geologist of the Geological Survey and an engineer of the Bureau of Mines. The examination was made at the request of the Regional Field Team to determine the advisability of granting a Government assistance loan. Jasper G. Hicks, company representative, accompanied the examining team to the property.

The applicant proposes to explore the property by vapor drilling. It is estimated 100 holes will be required. The estimated cost of the project is $15,500.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The claims are located on the northeast end of the Circle Cliffs in unsurveyed T. 33 S., R. 6 E., S.L.B. and M., Garfield County, Utah. The area is accessible from Torrey, Utah, via Fruita, Capital Reef, Notom, and then south 30 miles to the Burr Trail. From the Burr Trail several unimproved roads lead indirectly to the area of the claims, a distance of approximately 20 miles. The nearest shipping points are Green River, Utah, approximately 130 miles, and Marysvale, Utah, approximately 140 miles.

The claims cover a area of Shinarump sandstone. The gentle dip slope has been denuded of overlying sediments and cut by erosion to a point where movement of drilling equipment would be somewhat impeded. Any attempt to drill a grid pattern would be costly.

A temporary camp has been established at the property for conducting the exploratory work completed to date. Two trailer houses are still on the property. Water for camp use and for drilling is obtained from a nearby spring.

OWNERSHIP, HISTORY AND PRODUCTION

Five unpatented claims are held under lease by the North West Development Co. by agreement with Morris Mednick and Orson Ramsay, who hold them by right of location. The claims were located in August 1953. In September 1954, the lessors contracted the work of driving two drift headings on the Shinarump-Moenkopi contact. One drift was driven 120 feet and the other 84 feet. Settlement sheets furnished show two

shipments were made, one of 5-1/3 tons which averaged .22 percent U_3O_8, and one of 11.16 tons which averaged .14 percent U_3O_8. The only other work done on the property is a small amount of pick stripping along the base of the Shinarump.

The applicant is considered capable of completing the proposed work.

The claims are listed below:

Name of Claim	Notice of Location Book	Recorded Page	Amended Book	Location Page
Lone S, No. 1	15	257	50	266
Lone S No. 2	15	258	50	267
Lone S No. 3	15	259	50	268
Lone S No. 4	15	260	50	269
Lone S No. 5	15	261	50	270

A copy of the lease agreement and subordination agreement was furnished.

DESCRIPTION OF THE DEPOSITS

The usual geologic setting of the Colorado Plateau in the zone of Triassic rocks is present. The claims lie on a mesa of gently dipping beds of the Shinarump formation. A narrow box canyon cuts into the mesa exposing the full thickness of the Shinarump and the top of the underlying Moenkopi. The beds dip slightly to the northwest. A short distance east of the property the base of the Shinarump is again exposed in a long erosional escarpment facing the valley. Evidence of channeling into the Moenkopi can be seen in the cliff exposure. A thickening of the sandstone in the vicinity of the mine workings also suggests channeling in the area. The Shinarump in this area is a rather clean, white, coarse sandstone.

Radioactivity about twice background is present along the base. Carbonaceous material is present throughout the lower 5 feet. The carbon is usually highly radioactive. Slight copper staining is present and much pyrite can be distinguished in the lower 3 or 4 inches.

The work done in drifting exposes conditions similar to those exposed along the erosional face.

PROPOSED EXPLORATION

The applicant plans to further explore the property by wagon drilling. A total of 100 holes, aggregating 10,000 feet, is proposed. The estimated cost of doing this work is $15,500. An engineering report attached to the application includes an estimate of $5,000 for road construction and drill site preparation. The application lists $3,000 for road and drill site preparation. The $3,000 estimate is probably low because of the nature of the terrain. Any attempt to drill a grid pattern would be costly. By selecting favorable surface locations, the initial exploratory phase could be completed at a cost of $5,000 for roads. Some detailed study of the terrain would be needed to complete a grid plan of drilling after the holes are definitely located.

CONCLUSIONS AND RECOMMENDATIONS

Low-grade uranium mineralization is found at the base of the Triassic Shinarump in small and widely scattered occurrences on the Lone B group of claims. The applicant has completed considerable work in exploring the occurrences. The work consists of drifting and rim stripping. No sizable ore bodies have been found as a result of this work.

The applicant proposes additional work consisting of wagon drilling. In view of the unfavorable results obtained by the initial work, it is considered that additional work is not justified. It is recommended the application for lease be denied.

TRANSMITTED

IN REPLY REFER TO:

MAY 24 1955

DMEA
Date Rec'd.

MAY 23 1955

BUREAU OF MINES
Denver, Colorado

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

May 20, 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3588 (Uranium), North West Development Company, Lone B group of claims, Garfield County, Utah

Enclosed are 10 copies of a geologic report by E. S. Davidson, U. S. Geological Survey, covering his examination of the above subject property.

Davidson describes the geologic conditions on the Lone B group of claims and recommends that because of the very small size and erratic distribution of possible ore bodies, exploration assistance should be denied.

I concur with this recommendation.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (10)

ENHarshman:arh

MINERAL DEPOSITS
DMEA
RECEIVED
MAY 20 1955
U. S.
GEOLOGICAL SURVEY
DENVER, COLORADO

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
COLORADO PLATEAU DISTRICT
P. O. BOX 360
GRAND JUNCTION, COLORADO

May 11, 1955

Memorandum

To: E. N. Harshman, DMEA Field Team, Region III

From: W. P. Williams

Subject: North West Development Company, Lone B group of claims, Garfield County, Utah (DMEA 3588)

Transmitted herewith are 11 copies of geologic report by E. S. Davidson, covering the above-referenced property. Returned herewith is the brochure covering this application.

The applicant proposes to do 10,000 feet of wagon drilling to explore for uranium deposits in the Shinarump sandstone. Known deposits in the vicinity of the property are very small and erratically distributed. High-grade assays submitted by the applicant were found to be selected samples from places other than the Shinarump where ore deposits are to be expected. Because geologic conditions on the property are not favorable for the occurrence of significant uranium ore deposits, Davidson recommends that the application for DMEA assistance be denied. I concur with Davidson's recommendation.

We are sending one copy of the field examination report to S. R. Wilson for his information.

W P Williams

W. P. Williams
Geologist

WPW/mlr
Enclosures
cc: S. R. Wilson

UNITED STATES DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 3588, North West Development Company, Lone B group of claims
Garfield County, Utah

Uranium

Geologic Report

by

E. S. Davidson
U. S. Geological Survey

May 12, 1955

DMEA 3588

INTRODUCTION

The North West Development Company, c/o Minerals Engineering Company of Grand Junction, Colorado, has applied (DMEA Docket No. 3588) to the Defense Minerals Exploration Administration for assistance to explore for uranium ore on the Lone B claims Nos. 1 through 5. These claims are located in Garfield County, Utah, about 25 miles west of Escalante, Utah, (figs. 1 and 2). The applicant proposes 10,000 feet of wagon drilling at an estimated total cost of $15,500.00.

The property was examined on April 6, 1955, by a Region III examining team made up of Wm. Young of the U. S. Bureau of Mines, and E. S. Davidson and T. E. Mullens of the U. S. Geological Survey. The examining team was accompanied by a representative of the applicant, Jasper Hicks of Minerals Engineering Company, Grand Junction, Colo. The two partners who form the North West Development Company have had considerable mining experience. All the drifting done on the Lone B property was contracted to Minerals Engineering Company, Grand Junction, Colo.

Any ore mined from the property at the present time is trucked to Marysvale, Utah, a distance of approximately 175 miles, 75 miles of which is over unimproved gravel and dirt roads. These roads are passable all year although some snow removal would be required during February and March.

The applicant is a lessee. Copies of the lease have been submitted with the original application.

GEOLOGY

Rock units.-- Rocks cropping out on the Lone B claims in the immediate vicinity of the mine are the Moenkopi formation of Lower Triassic age and the overlying Shinarump conglomerate of Upper Triassic age (figs. 2 and 3).

Moenkopi formation.--The Moenkopi formation is a very thin-bedded siltstone to mudstone. Only the upper 50 feet or so of the Moenkopi is exposed in the vicinity of the mine. The normal color is red, except for a few feet under the Shinarump conglomerate, where the normal color is light to dark gray. This gray material weathers to a light yellow or tan on the outcrop. The Moenkopi is essentially unmineralized in the vicinity of the mine.

Shinarump conglomerate.--The Shinarump conglomerate is a medium-grained white sandstone composed mainly of quartz grains. Some carbonaceous fragments, grains of feldspar, and assorted heavy minerals were noted. The cement is a white clay-like material and the sandstone is moderately friable. The sandstone is about 50-60 feet thick in the vicinity of the mine.

The mine is on the southwest flank of the Circle Cliffs anticline in a narrow canyon cut into a northeast-trending fault zone (fig. 3). The contact between the Shinarump and the Moenkopi is about 20 feet higher on the west canyon edge than on the east canyon edge; the exposed fault planes are nearly vertical. The regional dip is about 3 degrees southwest.

ECONOMIC GEOLOGY

Most of the uranium ore produced from the Circle Cliffs area has been mined from the Shinarump conglomerate and the Moenkopi formation within a few feet of their contact. The highest grade material is generally found on the contact between these two units. Uraninite is the most common primary mineral; various uraniferous copper phosphates and sulfates are present in weathered material. Nearly all the ore mined is more copper-rich in the weathered material, and chalcopyrite (?) and pyrite are common associates of the unweathered uranium ore. About the only large-scale factor common to all of the deposits mined to date is their occurrence in a sandstone-filled paleochannel in the top of the Moenkopi formation. The thickness of sandstone above the channel base does not appear to be important, as deposits are found in all ranges of sandstone thickness from 20 feet to over 100 feet.

The Lone B adits are on the south flank of a westward-trending channel (fig. 3). The channel is about 25 feet deep and 500 feet wide on the rim 2,000 feet east of the mine, but in the vicinity of the mine, it is much wider and only about 15 feet deep. The sandstone filling the channel contains significant uraniferous material only in the vicinity of the two adits. The base of the channel, exposed about 300 feet across the canyon east of the mine, is essentially non-radioactive. The channel bottom outcrops again on a rim edge 2,000 feet east of the mine, but no prospect pits have been dug; so the radioactivity is probably very low there.

The uraniferous material in the two adits is intimately associated with carbonaceous trash in the sandstone. This carbonaceous trash averages about 5 percent of the total volume of the sandstone but only a small amount of the trash is radioactive. In general, radioactive material is confined to the lower 2 feet of the Shinarump sandstone and the very spotty commercial-grade material is found in a 3- to 6-inch zone above the Moenkopi-Shinarump contact. The channel samples cut by the applicant's representative, and shown on Appendix B of the applicant's report, are completely unrepresentative of typical mineralized material in the adits. In every case, the material producing most of the U_3O_8 in the sample was a very high-grade piece of carbonaceous material near the Moenkopi contact. The radiometric readings, averaging about 0.03 percent eU_3O_8 (Appendix B of applicant's report), are a much better indication of the grade of uraniferous material, most of which was not over a foot or so in thickness. One small pocket about 15 inches high and 10 feet wide in the north adit 50-60 feet from the portal, contained 0.10 to 0.30 percent eU_3O_8 on the north wall. This small deposit is localized in a depression in the top of the Moenkopi. The depression is lineated in a direction opposite the trend of the main channel and is less definite on the south wall of the adit than on the north wall; hence, it is not likely to continue to the south and its extent to the north is limited by the center or low point of the main channel. The uranium content is much less on the south wall than on the north wall.

ORE RESERVES AND PRODUCTION

Two ore shipments have been made from the Lone B property. The first was 5.33 tons which assayed 0.22 percent U_3O_8 and 1.86 percent copper. The second shipment was 11.16 tons which assayed 0.14 percent U_3O_8 and o.44 percent copper. Both of these shipments were selective; the first was probably from the weathered outcrop. Not more than 20 or so more tons of this material can be inferred. Because of the spotty nature of the uraniferous material, and its close association only with carbonaceous trash, the presence of a large tonnage of ore seems very unlikely.

PROPOSED EXPLORATION

The applicant proposes 10,000 feet of wagon drilling at a total estimated cost if $15,500. The drilling in the vicinity of the two adits is to be on 60- to 70-foot centers in a rectangular grid covering an area 350 feet from the canyon edge, 800 feet north, and 350 feet south of the north adit (see Appendix A, Attachment 4(a)-1 of applicant's report). Drilling on the remainder of the five claims is to be on approximately 350-foot centers in a rectangular grid.

CONCLUSIONS AND RECOMMENDATIONS

The deposit does not warrant exploration aid by DMEA funds. It is still in the prospect stage and conditions do not appear favorable for development of an ore body of minable size.

Mr. Young of the U. S. Bureau of Mines, Mr. D. Grundy of the Atomic Energy Commission, and T. E. Mullens of the Geological Survey concur with the author's opinion that the loan should be denied.

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3588

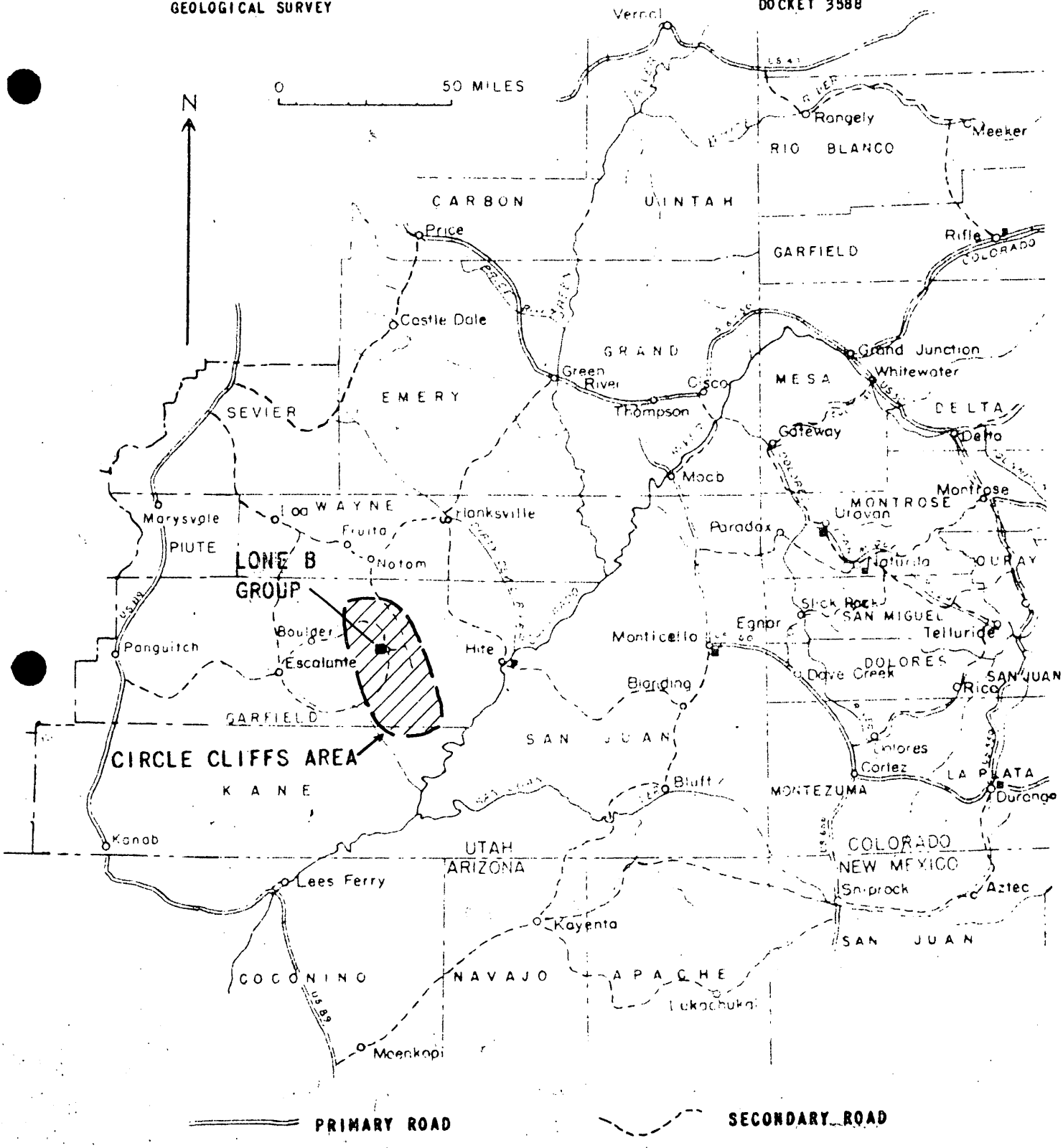

Figure 1. INDEX MAP OF PART OF COLORADO PLATEAU SHOWING LOCATION OF NORTHWEST DEVELOPMENT COMPANY, LONE B GROUP OF CLAIMS, CIRCLE CLIFFS AREA, GARFIELD AND KANE COUNTIES, UTAH

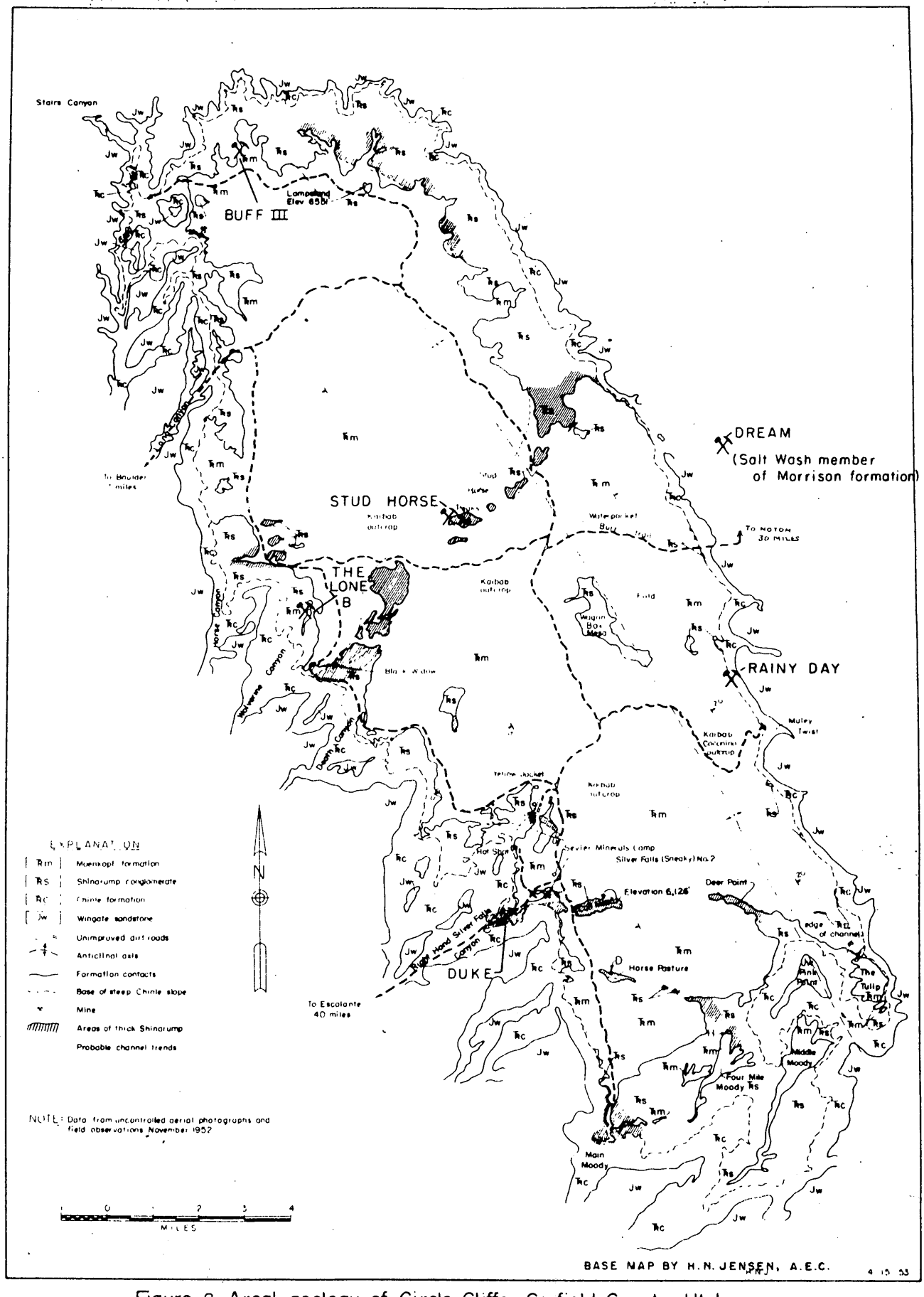

Figure 2. Areal geology of Circle Cliffs, Garfield County, Utah

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3588

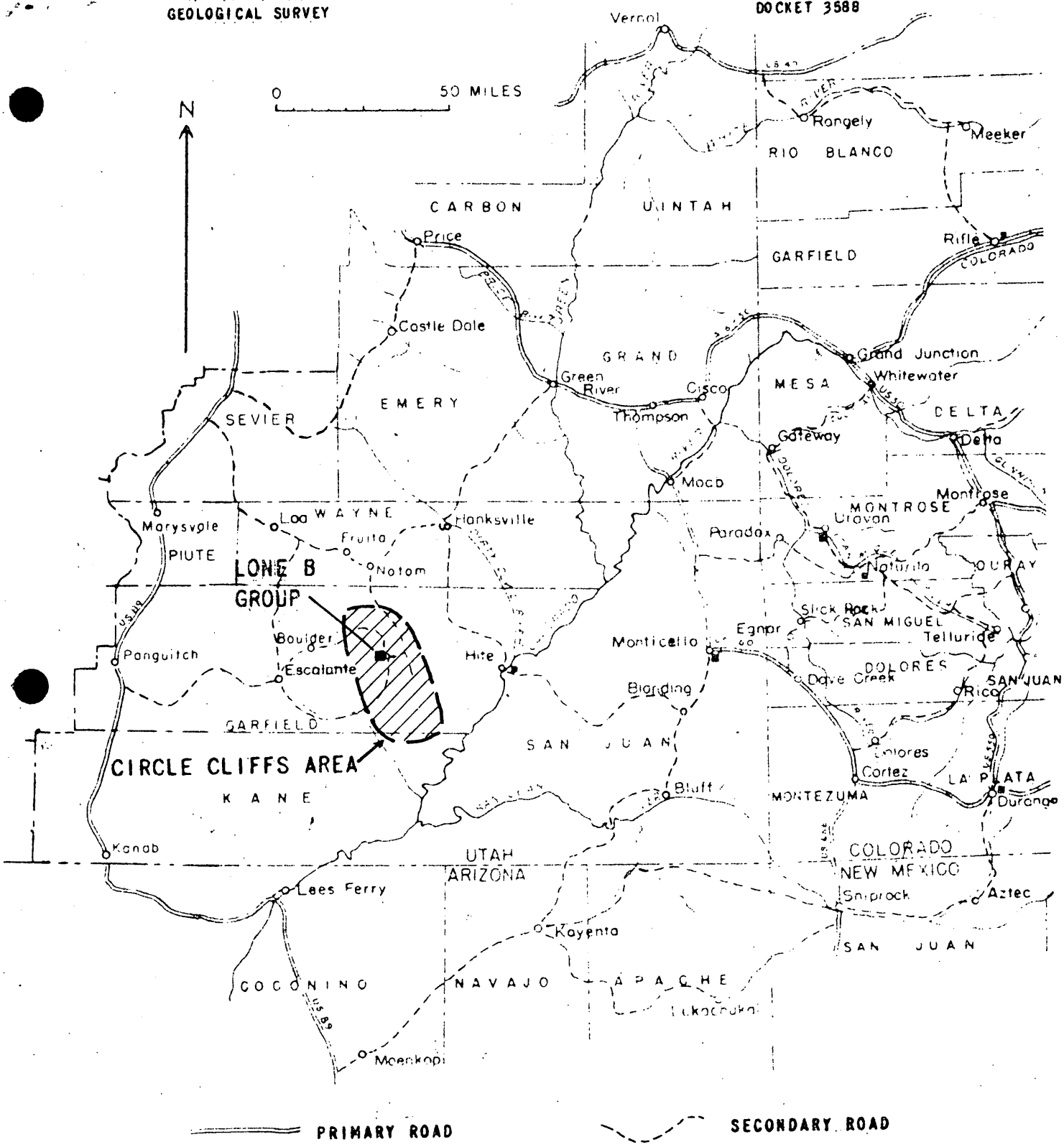

Fig. 1. INDEX MAP OF PART OF COLORADO PLATEAU SHOWING LOCATION OF NORTHWEST DEVELOPMENT COMPANY, LONE B GROUP OF CLAIMS, CIRCLE CLIFFS AREA, GARFIELD AND KANE COUNTIES, UTAH

700

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

Surname copy
F. L. Knouse
Ellis
Kilsgaard
Hedges
Selfridge
Johnson

JUN 16 1955

North West Development Company
c/o Minerals Engineering Company
801 Fourth Avenue
(P. O. Box 1951)
Grand Junction, Colorado

Re: Docket No. DMEA-3588 (Uranium)
Lone B claims
Circle Cliffs Area
Garfield County, Utah

Gentlemen:

Your application for aid in an exploration project and other reports available to us in Washington concerning the subject property have been reviewed.

Projects approved by this Agency 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 lease, indicates to us that the probability of disclosing minable ore reserves by your proposed program is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

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

Sincerely yours,

Frank E. Johnson

ACTING Administrator

cc to: J. E. Little
Box 248
Foresthill, California

K. F. Nutting
Box 750
Salinas, California

FLKnouse/gla
6-9-55

cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. J. E. Crawford, Rm. 3641
T. H. Kiilsgaard, Rm. 5224
J. O. Hosted, Rm. 3210, GSA
Code 700
Mr. Knouse
DMEA Field Team, Region III (2)

R.C.

(Docket Copy) 700

F. L. Knouse

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

WASHINGTON 25, D. C.

Summary of Proposed Project

By: F. L. Knouse June 9, 1955

Object: Denial of application for exploration aid

Docket No.: DMEA-3588

Applicant: North West Development Company (a co-partnership, Oregon)
c/o Minerals Engineering Company
801 Fourth Avenue (P. O. Box 1951)
Grand Junction, Colorado

Partners: J. E. Little
Box 248
Foresthill,
California

K. B. Nutting
Box 750
Salinas,
California

Property: Consists of 5 unpatented mining claims, Lone B Nos. 1 through 5, in unsurveyed T. 33 S., R. 6 E., S.L.B. and M., Garfield County, Utah, and known as the Circle Cliffs Area.

Date of Application: November 19, 1954

Amount of Application: $15,500.00

Work Proposed:

10,000 feet of wagon drilling @ $1.00/ft.	$10,000.00
Drill site preparation, including moving in and out costs	3,500.00
Geology and engineering	2,000.00
Total estimated cost	$15,500.00

A total of 100 holes (10,000 feet of wagon drilling) from the surface is proposed to explore the base of the Triassic Shinarump sandstone for uranium in four separate areas. In two of the areas the proposed drill hole spacing varies from 60 X 70 feet to 100 X 125 feet, and in the other two areas the hole spacing is approximately 350 feet.

Field Team
Report: Dated May 24, 1955

Since the amount of the application was within the delegated authority of Region III, a field examination was made without a request by the Washington Office.

Examining Engineers:

"Low grade uranium mineralization is found at the base of the Triassic Shinarump in small and wildly scattered occurrences on the Lone B group of claims. The Applicant has completed considerable work in exploring the occurrences. The work consists of drifting and rim stripping. No minable ore bodies have been found as a result of this work."

"The uraniferous material in the two adits is intimately associated with carbonaceous trash in the sandstone. This carbonaceous trash averages about 5 percent of the total volume of the sandstone but only a small amount of the trash is radioactive. In general, radioactive material is confined to the lower 2 feet of the Shinarump sandstone and the very spotty commercial-grade material is found in a 3- to 6-inch zone above the Moenkopi-Shinarump contact. The channel samples cut by the Applicant's representative, and shown on Appendix B of the Applicant's report, are completely unrepresentative of typical mineralized material in the adits."

"Because of the spotty nature of the uraniferous material, and its close association only with carbonaceous trash, the presence of a large tonnage of ore seems very unlikely."

"The deposit does not warrant exploration aid by DMEA funds."

Field Team:

"We concur in the recommendation of the field examiners that the application be denied."

Commodity Members' Comments:

Bureau of Mines: John E. Crawford, dated June 10, 1955

Concurs with the Field Team.

Geological Survey, T. H. Kiilsgaard, dated June 3, 1955

Concurs with the Field Team.

Rare and Miscellaneous Metals Division - F. L. Knouse

The project is designed to explore the uranium-bearing horizon (base of the Triassic Shinarump sandstone underlying the property concerned) by means of drilling 100 holes from the surface with a wagon drill. The average depths of the holes is unknown but will probably range from 75 to 225 feet.

The examining engineer and geologist were not able to verify the uranium content in channel samples as represented in the report submitted with the application. Since only very small size, erratically distributed uraniferous bodies have been found and only such bodies are likely to be found on the property, neither are there any reported worthy occurrences striking towards this property that would justify the proposed program or a modification thereof. Therefore, this Division concurs with the Field Team and the Uranium Commodity members, and a denial letter to the Applicant advising him of the decision has been prepared.

Ernest Wm. Ellis

Ernest Wm. Ellis

6/13/55 gla

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

June 10, 1955

RECEIVED
JUN 13 1955

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4445

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

Subject: Docket DMEA 3588, Report of Examination
North West Development Company, Lone B claims,
Garfield County, Utah

I have reviewed the Field Team report of examination, North West Development Company, DMEA Docket 3588, and I have discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

We concur with the recommendation of the Field Team that the application be denied.

The report has been forwarded to the Chief, Division of Minerals, in accord with the routing slip attached thereto.

John E. Crawford
John E. Crawford

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

RECEIVED
JUN 13 1955

June 10, 1955

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4445

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

Subject: Docket DMEA 3588, Report of Examination
North West Development Company, Lone B claims,
Garfield County, Utah

I have reviewed the Field Team report of examination, North West Development Company, DMEA Docket 3588, and I have discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

We concur with the recommendation of the Field Team that the application be denied.

The report has been forwarded to the Chief, Division of Minerals, in accord with the routing slip attached thereto.

John E. Crawford

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

RECEIVED
JUN 13 1955

June 10, 1955

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4445

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

Subject: Docket DMEA 3588, Report of Examination
North West Development Company, Lone B claims,
Garfield County, Utah

I have reviewed the Field Team report of examination, North West Development Company, DMEA Docket 3588, and I have discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

We concur with the recommendation of the Field Team that the application be denied.

The report has been forwarded to the Chief, Division of Minerals, in accord with the routing slip attached thereto.

John E. Crawford

IN REPLY REFER TO:

6-6-55
Am.

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

RECEIVED
JUN - 6 1955

June 3, 1955

Memorandum

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

From: T. H. Kiilsgaard, U. S. Geological Survey

Subject: Review of Field Team report, DMEA-3588, North West Development Co., Garfield County, Utah

The applicant has proposed to explore its Lone B claims by wagon drilling, 10,000 feet of drilling at an estimated cost of $15,500 requested for this purpose.

Field examiners report the Lone B claims to have been previously explored by 2 short adits and some rim stripping. The adits explore the south flank of a westward-trending paleochannel occurring in the Shinarump conglomerate near its contact with the underlying Moenkopi formation. These workings and the outcrop show that uranium mineralization is, in general, confined to the lower 2 feet of the Shinarump and that spotty commercial-grade uranium ore is confined to a 3 to 6-inch zone above the Moenkopi-Shinarump contact. Total production from the workings consists of 16.49 tons which ~~has~~ had a weighted assay of .166% U_3O_8. This ore is believed to have been selected.

Field examiners recommend denial of the property on the grounds that possible ore bodies will be erratic and of very small size. Further, it would appear that the possible grade of the worth is not enough to justify exploration.

I concur with the field examiners and recommend denial of the property.

T. H. Kiilsgaard

T. H. Kiilsgaard

IN REPLY REFER TO:

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

RECEIVED
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I concur with the field examiners and recommend denial of the property.

T. H. Kiilsgaard

THKiilsgaard:hlm
G-6/3/55
Copy to: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641 Interior
J. O. Hosted, 3210 GSA

IN REPLY REFER TO:

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

RECEIVED
JUN - 6 1955

June 3, 1955

Memorandum

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I concur with the field examiners and recommend denial of the property.

T. H. Kiilsgaard

THKiilsgaard:hlm
G-6/3/55
Copy to: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641 Interior
J. O. Hosted, 3210 GSA

IN REPLY REFER TO:

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

RECEIVED
JUN - 6 1955

June 3, 1955

Memorandum

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

From: T. N. Kiilsgaard, U. S. Geological Survey

Subject: Review of Field Team report, DMEA-3586, North West Development Co., Garfield County, Utah

The applicant has proposed to explore its Lone B claims by wagon drilling, 10,000 feet of drilling at an estimated cost of $15,500 requested for this purpose.

Field examiners report the Lone B claims to have been previously explored by 2 short adits and some rim stripping. The adits explore the south flank of a westward-trending paleochannel occurring in the Shinarump conglomerate near its contact with the underlying Moenkopi formation. These workings and the outcrop show that uranium mineralization is, in general, confined to the lower 2 feet of the Shinarump and that spotty commercial-grade uranium ore is confined to a 3 to 6-inch zone above the Moenkopi-Shinarump contact. Total production from the workings consists of 16.49 tons which has had a weighted assay of .166% U_3O_8. This ore is believed to have been selected.

Field examiners recommend denial of the property on the grounds that possible ore bodies will be erratic and of very small size. Further, it would appear that the possible grade of the ore is not enough to justify exploration.

I concur with the field examiners and recommend denial of the property.

T. N. Kiilsgaard

TNKiilsgaard:hlm
G-6/3/55
Copy to: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641 Interior
J. O. Nested, 3210 GSA

6/7/55 gla

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

RECEIVED
JUN - 3 1955

224 New Customhouse
Denver 2, Colorado

May 31, 1955

Memorandum

To: Chairman of the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3588 (Uranium), North West Development Company, Lone B claims, Garfield County, Utah

Enclosed are the original and three copies of a separate section, Summary, Conclusions and Recommendations pertaining to the Report of Examination which was forwarded your office May 25, 1955.

Will you please attach a copy of the Summary, Conclusions and Recommendations to each copy of your report.

W. M. Traver

W. M. Traver

Enclosures

RECEIVED
JUN - 3 '75

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By E. S. Davidson and W. E. Young

North West Development Co., a partnership, has applied for DMEA assistance in exploring uranium property in the Circle Cliffs area, Garfield County, Utah. The applicant has requested funds, under docket No. DMEA-3588, to explore the Lone B group of five unpatented lode claims. The proposed exploration consists of 10,000 feet of wagon drilling, estimated by the applicant to cost $15,500.

The Lone B claims cover a mesa of gently dipping beds of Triassic Shinarump conglomerate. The full thickness of the formation and the top of the underlying Moenkopi formation are exposed in a narrow canyon cut into a northeast-trending fault zone. East of the Lone B claims, the base of the Shinarump is exposed in an erosional escarpment. Evidence of channeling at the top of the Moenkopi can be noted in the cliff exposures. Two adits driven on the south flank of a westward-trending channel follow the Shinarump-Moenkopi contact. Uranium mineralization encountered in this area is associated with carbonaceous trash in the sandstone. Radioactivity is confined principally to the lower 2 feet of the Shinarump sandstone. The small ore-grade bodies occur in a 3- to 6-inch zone above the Moenkopi-Shinarump contact.

The examiners do not believe the Lone B claims have sufficient merit to warrant Government participation in exploration. Rim stripping

and underground work completed to date have disclosed only small, erratically distributed bodies of uranium-bearing sandstone. It is believed that further exploration will not result in discovery of significant uranium mineralization, and it is therefore recommended that the loan request be denied.

6-6-55
Am

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

224 New Customhouse
Denver 2, Colorado

May 24, 1955

Memorandum

To: Chairman of the Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Report of Examination, DMEA Docket 3588 (Uranium), North West Development Co., (Lone B group of claims), Garfield County, Utah

Enclosed are the original and three copies of the report pertaining to the above application.

We concur in the recommendation of the field examiners that the application be denied.

W. M. Traver

W. M. Traver

E. N. Harshman

E. N. Harshman

Enclosures.

Reviewed by
DMEA OPERATING COMMITTEE
6-3-55
(date)

MAY 24 1955 TRANSMITTED
IN REPLY REFER TO

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DMEA
Date Rec'd.
MAY 23 1955

Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

BUREAU OF MINES
Denver, Colorado

May 20, 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3588 (Uranium), North West Development Company, Lone B group of claims, Garfield County, Utah

Enclosed are 10 copies of a geologic report by E. S. Davidson, U. S. Geological Survey, covering his examination of the above subject property.

Davidson describes the geologic conditions on the Lone B group of claims and recommends that because of the very small size and erratic distribution of possible ore bodies, exploration assistance should be denied.

I concur with this recommendation.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (10)

ENHarshman:arh

Reviewed by
DMEA OPERATING COMMITTEE
6-3-55
(date)

MINERAL DEPOSITS
DMEA
RECEIVED
MAY 20 1955
U. S.
GEOLOGICAL SURVEY
DENVER, COLORADO

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
COLORADO PLATEAU DISTRICT
P. O. BOX 360
GRAND JUNCTION, COLORADO

May 11, 1955

Memorandum

To: E. N. Harshman, DMEA Field Team, Region III

From: W. P. Williams

Subject: North West Development Company, Lone B group of claims, Garfield County, Utah (DMEA 3588)

Transmitted herewith are 11 copies of geologic report by E. S. Davidson, covering the above-referenced property. Returned herewith is the brochure covering this application.

The applicant proposes to do 10,000 feet of wagon drilling to explore for uranium deposits in the Shinarump sandstone. Known deposits in the vicinity of the property are very small and erratically distributed. High-grade assays submitted by the applicant were found to be selected samples from places other than the Shinarump where ore deposits are to be expected. Because geologic conditions on the property are not favorable for the occurrence of significant uranium ore deposits, Davidson recommends that the application for DMEA assistance be denied. I concur with Davidson's recommendation.

We are sending one copy of the field examination report to S. R. Wilson for his information.

W P Williams

W. P. Williams
Geologist

WPW/mlr
Enclosures
cc: S. R. Wilson

Reviewed by
DMEA OPERATING COMMITTEE
6-3-55
(date)

UNITED STATES DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA ~~3388~~ 3588, North West Development Company, Lone B group of claims
Garfield County, Utah

Uranium

Geologic Report

by

E. S. Davidson
U. S. Geological Survey

May 12, 1955

Reviewed by
DMEA OPERATING COMMITTEE
6-3-55
(date)

DMEA 3588

INTRODUCTION

The North West Development Company, c/o Minerals Engineering Company of Grand Junction, Colorado, has applied (DMEA Docket No. 3588) to the Defense Minerals Exploration Administration for assistance to explore for uranium ore on the Lone B claims Nos. 1 through 5. These claims are located in Garfield County, Utah, about 25 miles west of Escalante, Utah, (figs. 1 and 2). The applicant proposes 10,000 feet of wagon drilling at an estimated total cost of $15,500.00.

The property was examined on April 6, 1955, by a Region III examining team made up of Wm. Young of the U. S. Bureau of Mines, and E. S. Davidson and T. E. Mullens of the U. S. Geological Survey. The examining team was accompanied by a representative of the applicant, Jasper Hicks of Minerals Engineering Company, Grand Junction, Colo. The two partners who form the North West Development Company have had considerable mining experience. All the drifting done on the Lone B property was contracted to Minerals Engineering Company, Grand Junction, Colo.

Any ore mined from the property at the present time is trucked to Marysvale, Utah, a distance of approximately 175 miles, 75 miles of which is over unimproved gravel and dirt roads. These roads are passable all year although some snow removal would be required during February and March.

The applicant is a lessee. Copies of the lease have been submitted with the original application.

GEOLOGY

Rock units.-- Rocks cropping out on the Lone B claims in the immediate vicinity of the mine are the Moenkopi formation of Lower Triassic age and the overlying Shinarump conglomerate of Upper Triassic age (figs. 2 and 3).

Moenkopi formation.--The Moenkopi formation is a very thin-bedded siltstone to mudstone. Only the upper 50 feet or so of the Moenkopi is exposed in the vicinity of the mine. The normal color is red, except for a few feet under the Shinarump conglomerate, where the normal color is light to dark gray. This gray material weathers to a light yellow or tan on the outcrop. The Moenkopi is essentially unmineralized in the vicinity of the mine.

Shinarump conglomerate.--The Shinarump conglomerate is a medium-grained white sandstone composed mainly of quartz grains. Some carbonaceous fragments, grains of feldspar, and assorted heavy minerals were noted. The cement is a white clay-like material and the sandstone is moderately friable. The sandstone is about 50-60 feet thick in the vicinity of the mine.

The mine is on the southwest flank of the Circle Cliffs anticline in a narrow canyon cut into a northeast-trending fault zone (fig. 3). The contact between the Shinarump and the Moenkopi is about 20 feet higher on the west canyon edge than on the east canyon edge; the exposed fault planes are nearly vertical. The regional dip is about 3 degrees southwest.

Minerals Administration
RECEIVED
MAY 2 1 1955

ECONOMIC GEOLOGY

Most of the uranium ore produced from the Circle Cliffs area has been mined from the Shinarump conglomerate and the Moenkopi formation within a few feet of their contact. The highest grade material is generally found on the contact between these two units. Uraninite is the most common primary mineral; various uraniferous copper phosphates and sulfates are present in weathered material. Nearly all the ore mined is more copper-rich in the weathered material, and chalcopyrite (?) and pyrite are common associates of the unweathered uranium ore. About the only large-scale factor common to all of the deposits mined to date is their occurrence in a sandstone-filled paleochannel in the top of the Moenkopi formation. The thickness of sandstone above the channel base does not appear to be important, as deposits are found in all ranges of sandstone thickness from 20 feet to over 100 feet.

The Lone B adits are on the south flank of a westward-trending channel (fig. 3). The channel is about 25 feet deep and 500 feet wide on the rim 2,000 feet east of the mine, but in the vicinity of the mine, it is much wider and only about 15 feet deep. The sandstone filling the channel contains significant uraniferous material only in the vicinity of the two adits. The base of the channel, exposed about 300 feet across the canyon east of the mine, is essentially non-radioactive. The channel bottom outcrops again on a rim edge 2,000 feet east of the mine, but no prospect pits have been dug; so the radioactivity is probably very low there.

The uraniferous material in the two adits is intimately associated with carbonaceous trash in the sandstone. This carbonaceous trash averages about 5 percent of the total volume of the sandstone but only a small amount of the trash is radioactive. In general, radioactive material is confined to the lower 2 feet of the Shinarump sandstone and the very spotty commercial-grade material is found in a 3- to 6-inch zone above the Moenkopi-Shinarump contact. The channel samples cut by the applicant's representative, and shown on Appendix B of the applicant's report, are completely unrepresentative of typical mineralized material in the adits. In every case, the material producing most of the U_3O_8 in the sample was a very high-grade piece of carbonaceous material near the Moenkopi contact. The radiometric readings, averaging about 0.03 percent eU_3O_8 (Appendix B of applicant's report), are a much better indication of the grade of uraniferous material, most of which was not over a foot or so in thickness. One small pocket about 15 inches high and 10 feet wide in the north adit 50-60 feet from the portal, contained 0.10 to 0.30 percent eU_3O_8 on the north wall. This small deposit is localized in a depression in the top of the Moenkopi. The depression is lineated in a direction opposite the trend of the main channel and is less definite on the south wall of the adit than on the north wall; hence, it is not likely to continue to the south and its extent to the north is limited by the center or low point of the main channel. The uranium content is much less on the south wall than on the north wall.

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MAY 31 1955

ORE RESERVES AND PRODUCTION

Two ore shipments have been made from the Lone B property. The first was 5.33 tons which assayed 0.22 percent U_3O_8 and 1.86 percent copper. The second shipment was 11.16 tons which assayed 0.14 percent U_3O_8 and o.44 percent copper. Both of these shipments were selective; the first was probably from the weathered outcrop. Not more than 20 or so more tons of this material can be inferred. Because of the spotty nature of the uraniferous material, and its close association only with carbonaceous trash, the presence of a large tonnage of ore seems very unlikely.

PROPOSED EXPLORATION

The applicant proposes 10,000 feet of wagon drilling at a total estimated cost if $15,500. The drilling in the vicinity of the two adits is to be on 60- to 70-foot centers in a rectangular grid covering an area 350 feet from the canyon edge, 800 feet north, and 350 feet south of the north adit (see Appendix A, Attachment 4(a)-1 of applicant's report). Drilling on the remainder of the five claims is to be on approximately 350-foot centers in a rectangular grid.

CONCLUSIONS AND RECOMMENDATIONS

The deposit does not warrant exploration aid by DMEA funds. It is still in the prospect stage and conditions do not appear favorable for development of an ore body of minable size.

Mr. Young of the U. S. Bureau of Mines, Mr. D. Grundy of the Atomic Energy Commission, and T. E. Mullens of the Geological Survey concur with the author's opinion that the loan should be denied.

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3588

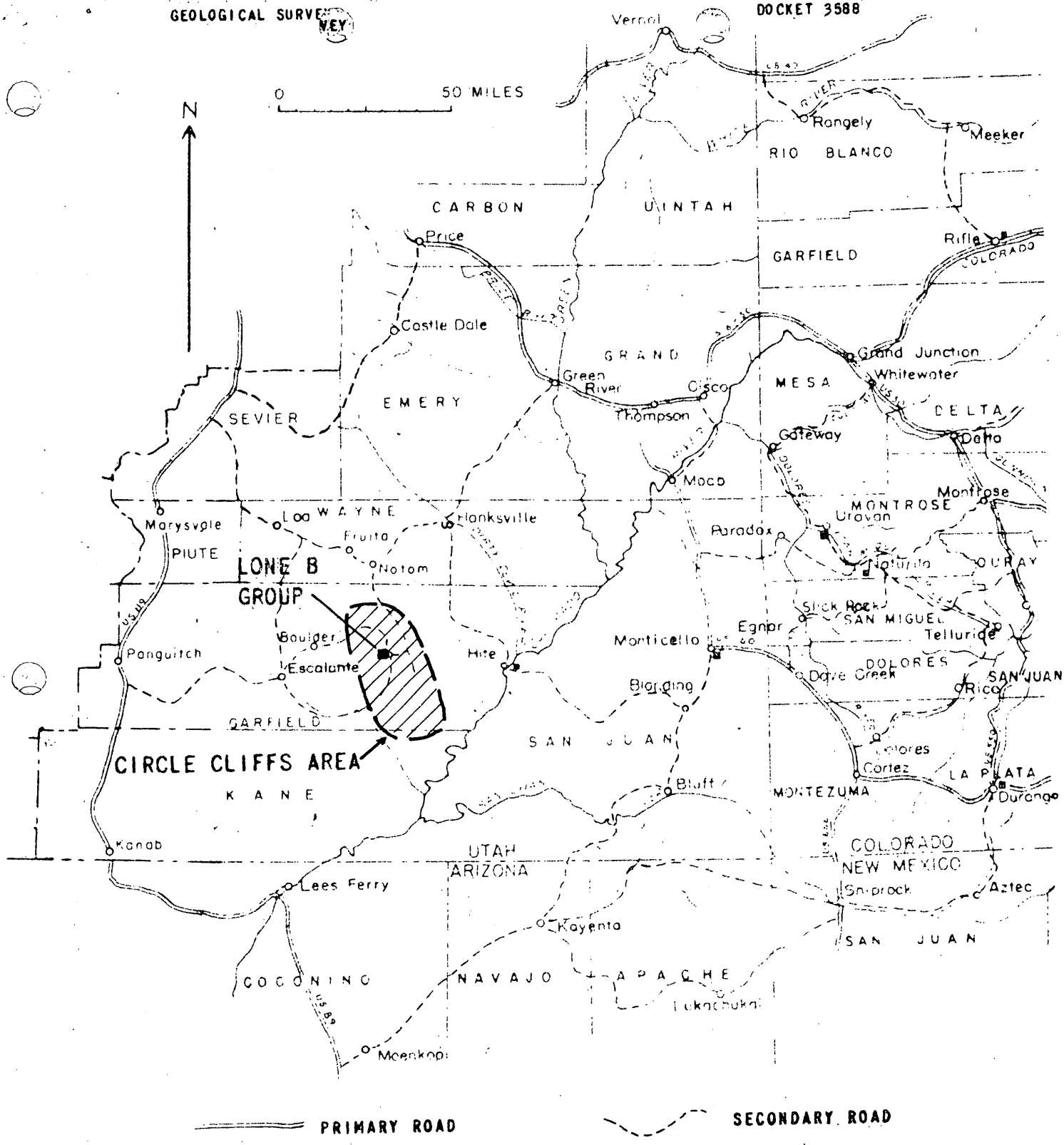


Figure 1. INDEX MAP OF PART OF COLORADO PLATEAU SHOWING LOCATION OF NORTHWEST DEVELOPMENT COMPANY, LONE B GROUP OF CLAIMS, CIRCLE CLIFFS AREA, GARFIELD AND KANE COUNTIES, UTAH

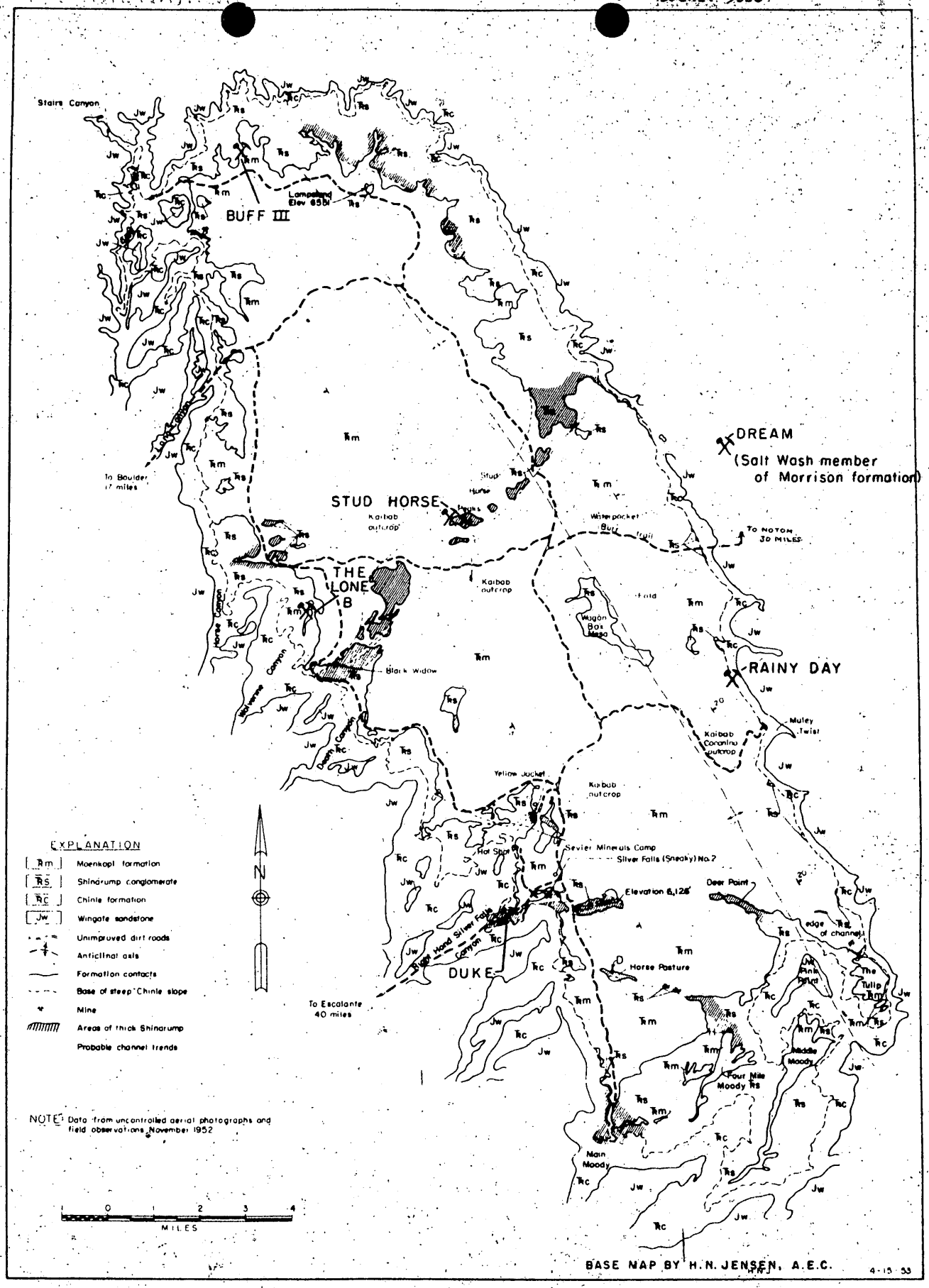
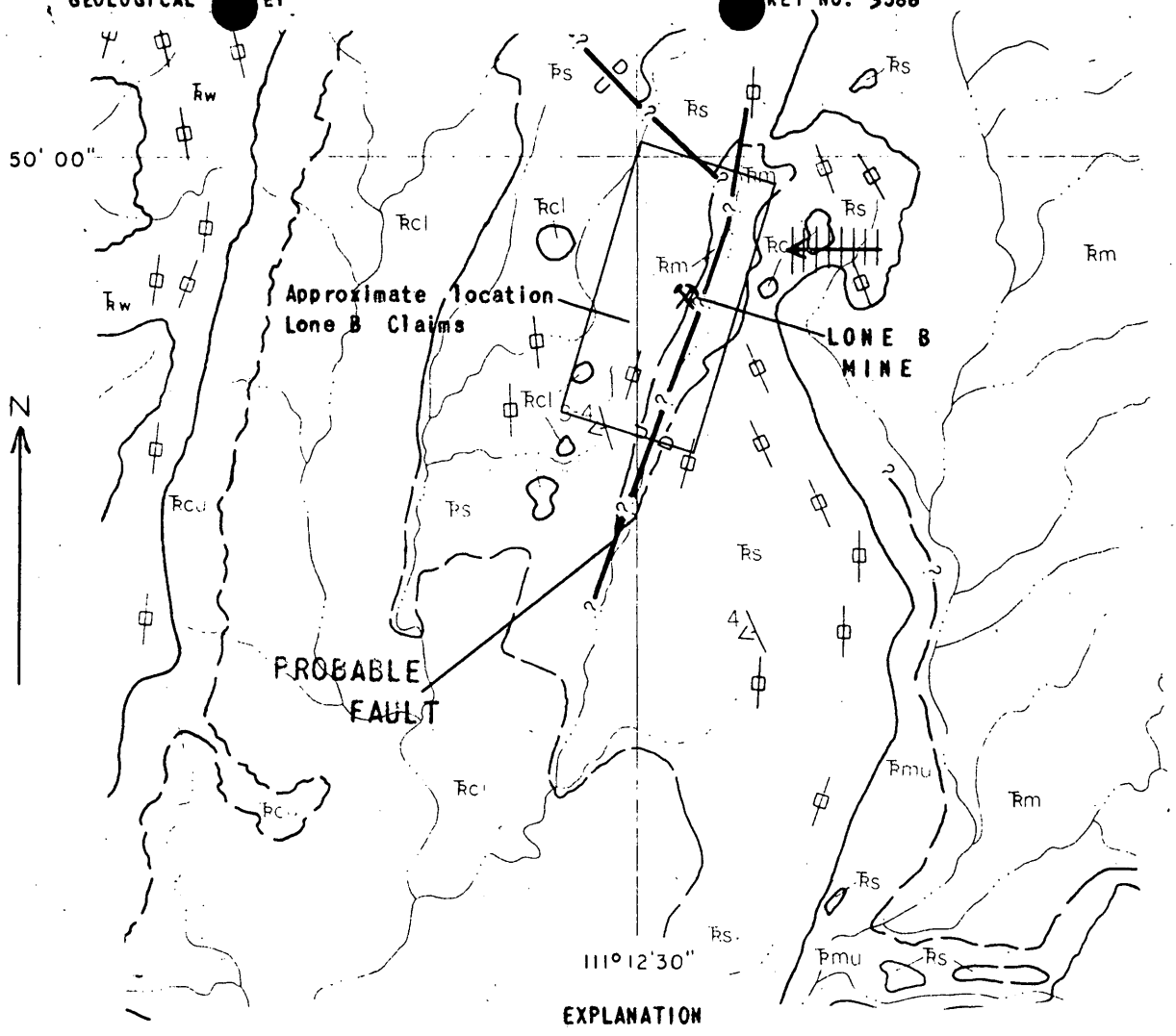


Figure 2. Areal geology of Circle Cliffs, Garfield County, Utah

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET NO. 3588



EXPLANATION

TRIASSIC

Ꞧw — WINGATE SANDSTONE

Ꞧcu / Ꞧcl — CHINLE FORMATION. UPPER UNIT, Ꞧcu; LOWER UNIT, Ꞧcl

Ꞧs — SHINARUMP CONGLOMERATE

Ꞧmu / Ꞧm — MOENKOPI FORMATION. UPPER UNIT, Ꞧmu

GEOLOGIC CONTACT. DASHED WHEN OF DOUBTFUL LOCATION. (?) PROBABLE CONTACT

STRIKE AND DIP OF BEDS

STRIKE OF APPROXIMATELY VERTICAL JOINTS

CHANNEL CUT IN TOP OF MOENKOPI FORMATION. ARROW SHOWS DIP OF DIRECTION OF CROSS-BEDS

MINE

NOTE: BASE FROM U. S. G. S. PHOTOGEOLOGIC QUADRANGLE MAP, CIRCLE CLIFFS 7-.

Figure 3. GEOLOGIC MAP SHOWING LONE B GROUP OF CLAIMS, NORTHWEST DEVELOPMENT COMPANY, CIRCLE CLIFFS AREA, GARFIELD AND KANE COUNTIES, UTAH

2000 0 4000 FEET

TRANSMITTED
MAY 24 1955

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
1600 EAST FIRST SOUTH STREET
SALT LAKE CITY 1, UTAH

DMEA
Date Rec'd, MAY 6 1955

DEPARTMENT OF THE INTERIOR
Minerals Administration
RECEIVED
MAY 31 1955
BUREAU OF MINES
Denver, Colorado

May 4, 1955

Memorandum

To: W. M. Traver, Executive Officer, DMEA Field Team, Region III

From: Stephen R. Wilson

Subject: Docket No. DMEA-3588 (Uranium), North West Development Co., Garfield County, Utah

Enclosed are the original and 10 copies of an engineering report pertaining to examination of the subject uranium property. W. E. Young conducted the examination and prepared the report. A copy of the brochure is also attached.

The applicant has requested a loan of $15,500 to explore the Lone B group of claims by wagon drill holes. Mineralization on the property occurs at the base of the Shinarump formation. Exploratory work completed to date has resulted in discovery of small, low-grade ore bodies. In view of the unfavorable results obtained from the initial exploration, the examining engineer concludes that Government participation in additional work is not warranted. He therefore recommends that the loan request be denied. I concur in this recommendation.

The property has been discussed with members of the Atomic Energy Commission.

Stephen R. Wilson
Stephen R. Wilson

Enclosure

cc: J. B. Clemmer

Reviewed by
DMEA OPERATING COMMITTEE
6-3-55
(date)

Department of the Interior
Defense Minerals Administration
RECEIVED
MAY 31 1955

NORTH WEST DEVELOPMENT CO.
GARFIELD COUNTY, UTAH
DMEA-3588
Uranium

Engineering Report

By W. E. Young
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
6-3-55
(date)

Minerals Administration
RECEIVED

NORTH WEST DEVELOPMENT CO.
GARFIELD COUNTY, UTAH

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Summary	2
Introduction	2
Location, topography and physical features	3
Ownership, history and production	3
Description of the Deposits	4
Proposed exploration	5
Conclusions and recommendations	5

ILLUSTRATIONS

Fig. 1 Location map, North West Development Co., Garfield County, Utah

Reviewed by
DMEA OPERATING COMMITTEE
6-3-55
(date)

TRANSMITTED
MAY 24 1955

SUMMARY

Field examination of the Lone B group of claims, North West Development Co., Garfield County, Utah, disclosed low-grade uranium mineralization in scattered occurrences in the basal Shinarump formation. Exploratory work completed by the applicant consists of drifting in two locations, 120 feet and 86 feet respectively, and a small amount of rim stripping. No minable ore bodies were disclosed as a result of the work. Additional work proposed by the applicant is designed to further test the property by wagon drilling. As proposed, it consists of 100 holes spaced at varying intervals to cover the five claims. In view of the unfavorable results obtained by the initial work, it is considered that additional work is not justified.

INTRODUCTION

Property of the North West Development Co., known as the Jack Little property, was examined April 6, 1955 by a geologist of the Geological Survey and an engineer of the Bureau of Mines. The examination was made at the request of the Regional Field Team to determine the advisability of granting a Government assistance loan. Jasper C. Hicks, company representative, accompanied the examining team to the property.

The applicant proposes to explore the property by wagon drilling. It is estimated 100 holes will be required. The estimated cost of the project is $15,500.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The claims are located on the northwest end of the Circle Cliffs in unsurveyed T. 33 S., R. 6 E., S.L.B. and M., Garfield County, Utah. The area is accessible from Torrey, Utah, via Fruita, Capitol Reef, Notam, and then south 30 miles to the Burr Trail. From the Burr Trail several unimproved roads lead indirectly to the area of the claims, a distance of approximately 20 miles. The nearest shipping points are Green River, Utah, approximately 130 miles, and Marysvale, Utah, approximately 140 miles.

The claims cover a mesa of Shinarump sandstone. The gentle dip slope has been denuded of overlying sediments and cut by erosion to a point where movement of drilling equipment would be somewhat impeded. Any attempt to drill a grid pattern would be costly.

A temporary camp has been established at the property for conducting the exploratory work completed to date. Two trailer houses are still on the property. Water for camp use and for drilling is obtained from a nearby spring.

OWNERSHIP, HISTORY AND PRODUCTION

Five unpatented claims are held under lease by the North West Development Co. by agreement with Morris Mednick and Orean Barney, who hold them by right of location. The claims were located in August 1953. In September 1954, the lessors contracted the work of driving two drift headings on the Shinarump-Moenkopi contact. One drift was driven 120 feet and the other 84 feet. Settlement sheets furnished show two

shipments were made, one of 5-1/3 tons which assayed .22 percent U_3O_8, and one of 11.16 tons which assayed .14 percent U_3O_8. The only other work done on the property is a small amount of rim stripping along the base of the Shinarump.

The applicant is considered capable of completing the proposed work.

The claims are listed below:

Name of Claim	Notice of Location Book	Recorded Page	Amended Book	Location Page
Lone B. No. 1	15	257	50	266
Lone B No. 2	15	258	50	267
Lone B No. 3	15	259	50	268
Lone B No. 4	15	260	50	269
Lone B No. 5	15	261	50	270

A copy of the lease agreement and subordination agreement was furnished.

DESCRIPTION OF THE DEPOSITS

The usual geologic setting of the Colorado Plateau in the zone of Triassic rocks is present. The claims lie on a mesa of gently dipping beds of the Shinarump formation. A narrow box canyon cuts into the mesa exposing the full thickness of the Shinarump and the top of the underlying Moenkopi. The beds dip slightly to the southwest. A short distance east of the property the base of the Shinarump is again exposed in a long erosional escarpment facing the valley. Evidence of channeling into the Moenkopi can be seen in the cliff exposure. A thickening of the sandstone in the vicinity of the mine workings also suggests channeling in the area. The Shinarump in this area is a rather clean, white, coarse sandstone.

Radioactivity about twice background is present along the base. Carbonaceous material is present throughout the lower 5 feet. The carbon is usually highly radioactive. Slight copper staining is present and much pyrite can be distinguished in the lower 3 or 4 inches.

The work done in drifting exposes conditions similar to those exposed along the erosional face.

PROPOSED EXPLORATION

The applicant plans to further explore the property by wagon drilling. A total of 100 holes, aggregating 10,000 feet, is proposed. The estimated cost of doing this work is $15,500. An engineering report attached to the application includes an estimate of $5,000 for road construction and drill site preparation. The application lists $3,000 for road and drill site preparation. The $5,000 estimate is probably low because of the nature of the terrain. Any attempt to drill a grid pattern would be costly. By selecting favorable surface locations, the initial exploratory phase could be completed at a cost of $5,000 for roads. Some detailed study of the terrain would be needed to complete a grid plan of drilling after the holes are definitely located.

CONCLUSIONS AND RECOMMENDATIONS

Low-grade uranium mineralization is found at the base of the Triassic Shinarump in small and widely scattered occurrences on the Lone B group of claims. The applicant has completed considerable work in exploring the occurrences. The work consists of drifting and rim stripping. No minable ore bodies have been found as a result of this work.

The applicant proposes additional work consisting of wagon drilling. In view of the unfavorable results obtained by the initial work, it is concluded that additional work is not justified. It is recommended the application for loan be denied.

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

224 New Customhouse
Denver 2, Colorado

November 26, 1954

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region 1V

Subject: DMEA application (Uranium), North West Development Company
Lone B mine, Circle Cliff Mining District
Garfield County, Utah

Two copies of the subject application were forwarded to the Washington Office this date (Code 200 letter). These copies of the application are incomplete as we have returned the claim maps to the North West Development Company for additions. A copy of our letter to the applicant is enclosed.

Maps will be forwarded when received.

for John F. Shaw
W. H. King

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

224 New Customhouse
Denver 2, Colorado

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W. H. King

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

224 New Customhouse
Denver 2, Colorado

November 26, 1954

North West Development Company
c/o Minerals Engineering Company
801 Fourth Avenue (P. O. Box 1951)
Grand Junction, Colorado

Re: DMEA application (Uranium), North West Development Company, Lone B mine, Circle Cliff Mining District Garfield County, Utah

Gentlemen:

Enclosed are the four copies of claim map which were submitted as part of the subject application. Please have your engineer plot the proposed locations of wagon drill holes on all four copies and return them to this office. We must know the locations of your work proposals in relation to your property boundaries.

It would also be of value to us to know the approximate depth of drill holes--at least the average depth in the different areas.

When the above information has been received, we will continue processing your application.

Yours very truly,

for John T. Shaw

W. H. King
Executive Officer, DMEA
Field Team, Region IV

Enclosures

RDB:mn

cc: Docket
Sec. to Oper. Comm. (1)
R.D.Berkenkotter
Chron.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

RECEIVED
NOV 29 1954

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. 3588
Metal or Mineral Uranium
Date Received
Estimated Cost $15,500
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: North West Development Company (a Co-Partnership, Oregon)
c/o Minerals Engineering Company
801 Fourth Avenue (P. O. Box 1951)
Grand Junction, Colorado

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

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

(*d*) If a partnership, add to the above statement the names and addresses of all partners. J. E. Little, Box 248, Foresthill, California, and K. R. Nutting, Box 750, Salinas, California

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

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

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

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

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

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

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

(*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.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you w[illegible] to explore .....

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

(*c*) The work will start within 30 days and be completed within 3 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.

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)?

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

☐ 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 November 19, 1954, 195...

Northwest Development Co
(Applicant)

By J. Smith — Partner —

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

3 (a) The legal description of this property is shown in the Abstract of Title which is included in Attachment 3 (a) of this application.

(b) The mine name by which this property is known is the Lone B.

(c) The North West Development Company's interest in this property is that of Lessee.

(d) The document under which the North West Development Company controls this property is included in Attachment 3(a) of this application.

(e) There are no known liens or encumbrances on this property as is shown by Attachment 3 (a) of this application.

(f) The book and page numbers for each recorded location notice of Lone B No. 1 through Lone B No. 5 are shown in the Abstract of Title which is included in Attachment 3 (a) of this application.

North West Development Company
c/o Minerals Engineering Company
801 Fourth Avenue
Grand Junction, Colorado

4 (a) On September 1, 1954, two exploratory drifts were collared into the exposed Shinarump-Moenkopi contact. This work was effected on account of there being commercial grade Uranium ore in place on the outcrop. The work was contracted by Minerals Engineering Company of Grand Junction, Colorado, and was terminated on October 7, 1954. A claim map which shows the locations of drift A and B is included in Attachment 4 (a)-1 of this application. Attachment 4 (a)-2 of this application shows radiometric assays made on 5-foot centers in each drift on each rib. Chemical assay values of channel samples are also indicated in Attachment 4 (a)-2. Attachment 4 (a)-3 shows a projection of line AA' of Appendix A and this projection shows a general depression into the Moenkopi that has been filled with Shinarump.

Drift A is approximately 8' x 8' in size and extends 120 feet on a bearing of N76°24'W. Drift B is approximately 8' x 8' in size and extends 84.2 feet on a bearing of N71°23'W. The drifts are approximately 200 feet apart.

The production facilities are classified as good on account of there being sufficient space for waste disposal and for stock-piling of ore. No timber was used for the underground operation.

The accessibility of the mine workings for examination purposes is good. Both workings are free of dangerous ground.

4 (b) A record of the past production is included in Attachment 4 (b) of this application. There is no current production and there are no ore reserves on the property.

4 (c) An engineering report is included in this application in Attachment 4 (c) and is submitted as a portion of the application. A summary of the geologic features of this property is included in the following paragraphs.

This property is situated on the Shinarump formation with the Moenkopi shales underlying. Both formations are Triassic in age. The Shinarump-Moenkopi contact is exposed for approximately 2100 feet on the property. The mineralization in the contact zone consists of Uranium, Pyrite, Chalcopyrite, and an abundance of Carbonaceous material. The deposition in this area is bedded. By orientation of conglomerate particles and by apparent imbricate structure in portions of the Shinarump-Moenkopi contact, the presence of channels is ascertained.

The angle of inclination of the Shinarump-Moenkopi contact was

4 (c) Continued

taken at intervals for approximately 1200 feet. Depressions in the Moenkopi which were filled with Shinarump sands and conglomerates were confirmed.

The average thickness of the Shinarump bed in this area is approximately 100 feet.

The reason for wishing to continue an exploration program is based upon the following factual statements: (1) Commercial grade uranium ore has been shipped from this property. (2) Small amounts of commercial grade uranium ore which could not be mined economically was encountered in both exploratory drifts. It is thought that these drifts are cross-cutting a major channel. (3) The possibility of feeder channels where concentrated precipitation of uranium from solution occurred before those streams were able to deposit any sizeable amount of uranium into the major channel does exist. (4) A wagon drilling program is the most economical means of further exploring this property.

4 (d) The access roads leading into the property are improved dirt roads. The nearest route into the property is from Green River, Utah to Hanksville, Utah for 58 miles. Turn right, through Hanksville and proceed 40 miles to Notom, Utah. Turn left at the Notom Junction and proceed 30 miles to the Burr Trail. From the foot of the Burr Trail it is 19 miles to the Lone B Claim group.

The access road on the property consists of one road which runs across Lone B No. 5, Lone B No. 4, Lone B No. 3, and ends on Lone B No. 2. This road is indicated in Attachment 4 (a)-1 of this application.

The nearest ore buying station is located in Marysville, Utah, which is 140 miles from the Lone B Claim group.

The most economic source of supply is considered to be in Grand Junction, Colorado, which is approximately 250 miles from the Lone B Claim group.

Residence for the proposed operation can be established on the Lone B Claim group.

4 (e) Manpower, materials, supplies, equipment, water, and power will be furnished by a contract drilling company agreeable to both the Administrator and the Operator.

North West Development Company
c/o Minerals Engineering Company
801 Fourth Avenue
Grand Junction, Colorado

5 (a) This proposed exploration project is for the purpose of developing uranium ore.

5 (b) Attachment 4 (a)-1 of this application indicates specific areas on the Lone B Claim group for the following recommended amounts of Wagon Drilling: Area No. 1 - 3,000 feet; Area No. 2 - 2,300 feet; Area No. 3 - 2,700 feet; Area No. 4 - 2,000 feet.

Area No. 1 is adjacent to and surrounds the exploratory drifts A and B. Uranium deposition is known to occur in both drifts.

Area No. 2 is directly West of AA' as indicated in Attachment 4 (a)-1. The projection of AA', which shows a depression of Shinarump into the Moenkopi, is shown in Attachment 4 (a)-3. This area indicates apparent channelization.

Areas No. 3 and No. 4 should be drilled in accordance with the geologic data obtained from Areas No. 1 and No. 2.

The drill sites for all four areas should be spaced in accordance with the geologic data obtained from each previous hole and also in accordance with the topographic features of the general area.

5 (d) Mr. J. E. Little is a Registered Civil Engineer with 25 years experience in mining and direction of mining operations which includes dredging, hydraulic operations, and underground hard-rock operations for gold.

Mr. K. R. Nutting has 18 years experience as owner and operator of dredging, hydraulic and hard-rock mining operations for gold and mercury.

The drilling program will be carried out by one of the major drilling companies agreed upon by the Administrator and the Operator.

North West Development Company
c/o Minerals Engineering Company
801 Fourth Avenue
Grand Junction, Colorado

6 (a) Independent Contract under allowable costs:

WAGON DRILL COSTS:

10,000 feet Wagon drilling @ $1.00 per foot	$10,000.00
Estimated costs for drill sites and access roads	3,000.00
Move-in move-out charge	500.00
Geologic consultation for the drilling	2,000.00
	$15,500.00
Total contract costs	$15,500.00

6 (b) A consultation charge for three month period is included in paragraph 6 (a).

6 (c) All operating materials and supplies will be furnished by the contractor.

6 (d) All operating equipment will be furnished by the contractor.

6 (e) Rehabilitation and repairs - None.

6 (f) New buildings, improvements, installations - None.

6 (g) Miscellaneous - None.

6 (h) Contingencies - None.

North West Development Company
Minerals Engineering Company
801 Fourth Avenue
Grand Junction, Colorado

7 (a) The North West Development Company is prepared to furnish 25% of the total contract costs which is in accordance with the regulations on Government participation.

7 (b) The North West Development Company's share of the cost will be furnished in money.

North West Development Company
c/o Minerals Engineering Company
801 Fourth Avenue
Grand Junction, Colorado

ATTACHMENT 3(a)

L I M I T E D M I N I N G C L A I M C E R T I F I C A T E

STATE OF UTAH)
: SS.
COUNTY OF GARFIELD)

I, BRUCE F. PARKER, a duly authorized abstracter within and for said County and State, hereby certify that the foregoing abstract, consisting of 22 pages, numbered from 1 to 22 inclusive of this certificate, are true and correct abstracts of the instruments therein shown, pertaining to the following described mining claims in Garfield County, State of Utah:

TOME "B" NOS. 1 to 5 inclusive, mining claims located by ORMAN BARNEY AND MORRIS MEDNICK.

No judgments appear of record against any of the aforesaid locators, within the eight years last past in the Judgment Docket in the office of the Clerk of the Sixth Judicial District Court of Garfield County, State of Utah.

No Federal Tax Liens appear against any of the said locators in the record kept for the purpose of filing the same, in the office of the Garfield County Recorder.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal this 3rd day of November, 1951 at 5:00 o'clock P.M. This abstract is made for the benefit of Orman Barney and Morris Mednick, their heirs, executors, administrators and assigns.

Bruce F. Parker

Bruce F. Parker, Authorized Abstracter

LEASE AGREEMENT

This indenture, made this 9th day of August 1954 between Orean Barney and Merrill Hedwick, both of Richfield, Sevier County, Utah, hereinafter called Lessors, and E.W. Nutting and J.E. Little doing business as Northwest Development Company, a copartnership, hereinafter referred to as Lessees, witnesseth;

That the Lessors, in consideration of the sum of Ten Thousand Dollars ($10,000.00), royalties, covenants and agreements herein reserved and expressed to be paid and performed by the Lessee, hereby let and demise unto the Lessee the following described unpatented mining claims situated in Circle Cliffs, Garfield County, State of Utah, described more particularly as:

Lone "B" No. 1

Lone "B" No. 2

Lone "B" No. 3

Lone "B" No. 4

Lone "B" No. 5

recorded in the names of the Lessors in the records of Garfield County, State of Utah, to have and to hold for the term of five years from the date hereof, together with all options for extensions as are hereinafter specified.

The Lessee hereunder does covenant and agree with the Lessors as follows;

1. To pay over to the Lessors hereunder the sum of Two Thousand Dollars ($2,000.00) at the time of signing this agreement, and to pay over to the Lessors hereunder the sum of Eight Thousand Dollars ($8,000.00) on or before the first day of October, 1954.

2. In addition to the above designated payments, the Lessee hereunder agrees to pay over to the Lessors a fifteen percent royalty payment on the gross return of all ores produced and marketed by the Lessees, which royalty expressly excludes allowances for development of said property and allowances for transportation of ores to government marketing stations, that said payment is to be calculated on the basis of gross ore sales less any additional sums necessary to supplement the government transportation allowance in order to transport the said ores to government buying stations.

3. It is further agreed by the Lessees hereunder that during the term of this lease a minimum royalty payment shall be made to the Lessors hereunder of Seven Thousand Two Hundred Dollars ($7,200.00) per year, and that such minimum royalty guarantees become effective one year from the date of this agreement, and to continue during the term or terms thereof. That said minimum guarantee shall be paid the Lessors hereunder at the rate of Six Hundred Dollars ($600.00) per month in the event and on the condition that royalties in the sum of Six Hundred Dollars ($600.00) are not received from production and marketing of said ores. In the event that royalties are received from the marketing of said ores during any calendar month, said Lessees hereunder hereby covenant and agree to pay over to the Lessors additional sums so that the payment of Six Hundred Dollars ($600.00) is thereby met. In the event that royalties in the sum of Seven Thousand Two Hundred Dollars ($7,200.00) are received during any calendar year, said minimum contract agreement is thereby met and royalty payments shall not be supplemented by to the Lessees. The foregoing payments are considered advance royalty payments and shall be returned to the Lessees hereunder out of royalties earned from ores produced and marketed, that said sums shall be repaid by the Lessors paying over to the Lessees of royalties in excess of Six Hundred Dollars ($600.00) per month received during any calendar month until fully repaid, should there be owing the Lessees payments for royalties in advance. In the event this agreement is terminated, any and all royalties advanced to the Lessors hereunder shall not be returned by them and shall be considered as liquidated damages.

4. The Lessees hereunder covenant to enter upon the said mining premises and work the same in a manner necessary to good and economical mining, so as to take out the greatest amount of ore possible with due regard to safety, development and preservation of said premises as a workable mine.

5. Lessees agree to perform all assessment work required by law each year, and to furnish the Lessors certified copies of affidavit of work performed, which requirement must be met at least ninety days prior to the date such notice of work performed must be filed and recorded.

6. Lessee agrees to pay any and all taxes assessed against personal property held in connection with said mining claims.

7. Lessee Hereby agrees to abide by all County, State and Federal Rules and Regulations relative to any and all phases of mining development and operations.

The Lessors hereunder covenant and agree as follows:

1. That the Lessees shall have during the term of this lease agreement and any extensions allowed hereunder quiet and peaceful possession to the above entitled mining property and shall be free from disturbance to properly develop the same.

The parties hereto covenant and agree as follows:

1. The Lessors shall have reserved to them the right to visit and inspect the property and working at reasonable time and make an inspection of cores and all information on diamond drilling, and that any and all mining information shall be made available to them at their request by the Lessees hereunder.

2. The period of this lease shall be for an initial term of five years, with options for five additional periods of five years each, up to a total of twenty-five (25) years, which options may be exercised by the Lessees hereunder by giving written notice to the Lessors hereunder at least sixty days prior to the expiration of said five year term, which option may be exercised providing the Lessee is in good standing as provided by the covenants and obligations herein contained.

3. It is agreed that the Lessees hereunder shall have the additional privilege of cancelling this lease during the term hereof by giving to the Lessors hereunder written notice so to do for a period of thirty days, which notice shall be considered given when mailed to the Lessors hereunder and posted in a United States postoffice, addressed to the Lessors each separately at Richfield, Utah.

4. It is agreed that this lease is assignable and is binding upon and shall inure to the benefit of the heirs, administrators, executors, successors or assigns of the respective parties hereto.

5. This lease may be terminated and cancelled by the Lessors hereunder upon default of the Lessees of any of the covenants and agreements herein contained, and such cancellation or termination shall be effective in event of default upon written notice given by the Lessors hereunder to the Lessees of their intention to so cancel.

6. In event of default of either of the parties hereunder of any covenants or agreements herein contained, the defaulting party or parties agree to pay all costs and a reasonable attorney's fee incurred by the non defaulting party in

enforcing the terms or any term of this agreement, whether or not suit is brought, and if brought, whether or not suit is prosecuted to judgment.

In witness whereof the parties hereto have hereunto signed their names this day and year above written.

Witness _____ Signed _____

_____ Orman Barney

_____ Northwest Development Co

_____ by _____

_____ _____

State of Utah }
County of Sevier } ss.

On this 5th day of August, 1954 personally appeared before me, a Notary Public, Morris Hednick, Orman Barney and J.E. Little, who duly acknowledged to me that they signed the foregoing lease agreement.

_____
Notary Public.

Residence:

My Commission Expires:
Aug 2, 1957

LEASE AGREEMENT MODIFICATION

This modification agreement, made this 30th day of September, 1984, between OREN BAKER and MARGO BAKER, both of Richfield, Sevier County, Utah, hereinafter called the Lessors, and L. E. BURTON and J. D. LITTLE dba, Partners of Southland Development Company, a copartnership, hereinafter referred to as Lessee,

WHEREAS the parties hereunder have entered into a certain lease agreement dated the 8th day of August, 1984, whereby the Lessors thereunder leased unto the Lessee, the following described unpatented mining claims situated in Pinole Gulch, Garfield County, State of Utah, which claims are described more particularly as:

Lode "A" No. 1

Lode "B" No. 2

Lode "C" No. 3

Lode "D" No. 4

Lode "E" No. 5

The parties hereunder in consideration of their mutual covenants contained the above described lease agreement should remain in full force and effect under the terms thereof with the express agreement that paragraph (1) under the section entitled, "The Lessee hereunder does covenant and agree with the Lessors as follows:" shall be modified to read:

"1. To pay unto the Lessors hereunder the sum of $2,000.00, the receipt of which is hereby acknowledged by the Lessors, and all received on the 8th day of August, 1984, and pay to the Lessors hereunder the sum of $500.00 on or before the 1st day of October, 1984, and the sum of $500.00 on or before the 1st day of each month thereafter for a total of 18 consecutive months and until the total sum of $9,000.00 has been paid under said modified agreement.

In the event of a default in said payments as above provided, the Lessors shall forfeit all right under said lease agreement and the agreement shall be cancelled and terminated and that all sums of money received by the Lessors under the terms thereof shall be held by them as liquidated damages.

It is expressly understood and agreed that the foregoing modification shall not modify or alter any other rights, duties, terms or conditions contained in said lease agreement.

IN WITNESS WHEREOF, the undersigned have hereunto set their hands the day first above written at Richfield, Utah.

Witness

Oren Baker

Margo Baker

L 7 9 0 R 6

Attest:

FORTMAST DEVELOPMENT COMPANY, a Corporation

L. E. Hussey

J. E. Little

STATE OF UTAH)
: SS.
COUNTY OF EMERY)

On the 30th day of September, 1954, personally appeared before me, a Notary Public, ORLON BARNEY, MARIS MERRICK and J. E. LITTLE, who duly acknowledged to me that they signed the foregoing Lease Agreement and Ratification.

Notary Public

My Commission Expires: July 2nd, 1956

STATE OF CALIFORNIA, } ss.

County of ..... On this ..... in the year one thousand nine hundred and ..... before me, ... a Notary Public in and for the County of ..... State of California, residing therein, duly commissioned and sworn, personally appeared ..... known to me to be the person ..... whose name ..... subscribed to the within instrument, and acknowledged to me that ..... he ..... executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal in the ..... County of ..... the day and year in this certificate first above written.

Notary Public in and for the ..... County of ..... State of California.
My Commission Expires .....

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 29 1954

MF-203
(Revised July 1, 1954)

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of Utah, County of Garfield, described as follows:1/

Unpatented mining claims located in Circle Cliffs area, to-wit:

Lone "B" No. 1
Lone "B" No. 2
Lone "B" No. 3
Lone "B" No. 4
Lone "B" No. 5

which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ Northwest Development Company, a Co-Partnership, consisting of K. R. Nutting and J. E. Little

hereinafter called the "Operator"; and

WHEREAS, under the provisions of said contract, the Government is entitled to a percentage royalty on production and to other rights and equities which do or may conflict with or be adverse to the rights of the undersigned:

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

1. The Government's equity in and right to dismantle, sever, take possession of, and remove and dispose of facilities, buildings, fixtures, equipment, or other items as provided in the contract or any amendment thereof shall prevail over and be prior and superior to any conflicting or adverse rights of the undersigned, and the Government is authorized to enter upon the land for such purposes.

2. To secure the payment to the Government of the percentage royalty on production3/ provided for under the terms of said exploration project contract or any amendment thereof there is hereby granted to the Government a lien upon the land above referred to and upon any production of minerals therefrom until said royalty is fully paid or ten years have elapsed from the date of the contract, whichever occurs first.

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

(OVER)

3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

4. Changes and added provisions _____

_____

_____

_____

Dated this 27th day of October, 195[illegible].

Morris Mednick [Seal]

Orran Barney [Seal]

_____ [Seal]

Form No. O-4 8-54 25M

COLORADO PLATEAU URANIUM ORE PROJECT

American Smelting and Refining Company, Ore Purchasing Agent For
United States Atomic Energy Commission

Receiving Station: Marysvale, Utah — Grand Junction, Colorado: August 27 19 54

Liquidation No.: 6622 — Lot No.: 1758 — Shippers Lot No.:

Bought of: Neal Mortensen — A.E.C. License No.: P-1875

Address: c/o R. L. Cuff; P. O. Box 186; Marysvale, Utah

Type of Ore: Copper-Uranium — Contract No.: — Date Received: 8/5/54

Mining Claim: Lone B — Mining District: Circle Cliff — Pile No.: 9

Lot No.	Wet Weight Pounds	H_2O	Dry Weight Pounds	SETTLEMENT ASSAYS U_3O_8	V_2O_5	$CaCO_3$	CU	CONTENTS POUNDS U_3O_8	V_2O_5	$CaCO_3$	CU
1758	23060	3.20	22322	.14		0.7	0.44	31.25		156.25	98.22

U308	Per Lb.	Per Ton	Short Tons	Total Value
0.14% = 2.8# at	$2.30	$6.44	11.1610	$ 71.87
Development allowance 2.8# at	.50	1.40	"	15.63
TOTAL U308 PAYMENT		$7.84	11.1610	$ 87.50
Haulage allowance (148) 100 miles @ 6¢ per wet ton mile			11.5300	69.18
TOTAL				$156.68
CU - No Pay less than 1.0% =				- - -
TOTAL GROSS PRICE				$156.68
Deductions				- - -
NET PROCEEDS				$156.68

Correct CFK — Paid August 26, 1954
Checked DPR — Vo. No. 8/222
Approved HER — Check No. 13112

eir

I certify that I am the lawful owner or authorized Representative of the Lawful Owner, of the Ore described in this Settlement Sheet and have legal right to deliver the same to the Commission.

I certify that I hold the A. E. C. Source Material License numbered above.

I hereby transfer to the Commission, effective as of the date of delivery of the ore, all my right, title and interest in and to said ore.

I will accept the amount as shown above as "Total Gross Price" in full settlement, except for final quarterly adjustment for average V_2O_5—U_3O_8 ratio, for sums due to me on account of the ore deliveries described herein.

Seller or Agent

Buyers assays govern if Seller fails to submit his assays prior to acceptance of payment.
All rates paid are based on U. S. Atomic Energy Commission Published Schedules.

Form No. O-4 8-54 25M

COLORADO PLATEAU URANIUM ORE PROJECT

American Smelting and Refining Company, Ore Purchasing Agent For
United States Atomic Energy Commission

Receiving Station Marysvale, Utah — Grand Junction, Colorado August 5 1954

Liquidation No. 5872 — Lot No. 1738 — Shippers Lot No.

Bought of Neal J. Mortensen — A.E.C. License No. P-T

Address c/o R. L. Cuff; P. O. Box 186; Marysvale, Utah

Type of Ore Copper-Uranium — Contract No. — Date Received 7/23/54

Mining Claim Lone B — Mining District Circle Cliff — Pile No. 9

Garfield County, Utah

Lot No.	Wet Weight Pounds	H_2O	Dry Weight Pounds	SETTLEMENT ASSAYS U_3O_8	~~[illegible]~~ $CaCO_3$	~~[illegible]~~ CU	CONTENTS POUNDS U_3O_8	~~[illegible]~~ $CaCO_3$	~~[illegible]~~ CU
1738	10790	1.30	10650	0.22	0.30	1.86	23.43	31.95	198.09

U308	Per Lb.	Per Ton	Short Tons	Total Value
.22% - 4.4# at	$3.50	$15.40	5.3250	$ 82.00
Development allowance 4.4# at	.50	2.20	"	11.72
Premium in excess of 4# per ton 4.4# - 4# - 0.4# at	.75	.30	"	1.60
TOTAL U308 PAYMENT		$17.90	5.3250	$ 95.32
Haulage allowance 100 miles @ 6¢ per wet ton mile			5.3950	32.37
TOTAL				$127.69

CU				
1.86% - 37.20#				
Less 1 unit or 20# - 17.20#				
Pay 40% of 17.20# - 6.88# at	$0.297*	2.043	5.3250	10.88
TOTAL GROSS PRICE				$138.57
Deductions				- - -
NET PROCEEDS				$138.57

Correct CFK — Paid August 6, 1954
Checked LRJ — Vo. No. 8/29
Approved HCJ — Check No. 12922

*E&MJ net refinery domestic copper wire bar quotation average, week ending 7/24/54.

I certify that I am the lawful owner or authorized Representative of the Lawful Owner, of the Ore described in this Settlement Sheet and have legal right to deliver the same to the Commission.

I certify that I hold the A. E. C. Source Material License numbered above.

I hereby transfer to the Commission, effective as of the date of delivery of the ore, all my right, title and interest in and to said ore.

I will accept the amount as shown above as "Total Gross Price" in full settlement, except for final quarterly adjustment for average V_2O_5—U_3O_8 ratio, for sums due to me on account of the ore deliveries described herein.

Seller or Agent

Buyers assays govern if Seller fails to submit his assays prior to acceptance of payment.
All rates paid are based on U. S. Atomic Energy Commission Published Schedules.

Form No. 2 Rev. 2M 6-52

COLORADO PLATEAU URANIUM ORE PROJECT

AMERICAN SMELTING AND REFINING COMPANY
ORE PURCHASING AGENT FOR
UNITED STATES ATOMIC ENERGY COMMISSION

No. 1738

WEIGHT AND ASSAY CERTIFICATE

MARYSVALE STATION

Shipper: Neal J. Mortensen A.E.C. License No.: K-T- Shipper's Lot No.: Pile No.:

Date Weighed	R. R. Car No. Truck Lic. No.	Scale Ticket No.	Mileage	Wet Weight Pounds	H_2O	Dry Weight Pounds	Mining Claim	District	County	State	Pile No.
7-23-54	35577	5103	100	10790	13	10650	Lone B Cu. U.	Cide Cliff	Garfield	Ut.	9
			(B)	10790	13	10650					

Sampling Foreman: Robert L. Cliff Date: JUL 28 1954

Assays		C.P.U.O.P.	Shipper	Umpire	Settlement
U_3O_8	%	0.02			
V_2O_5	%	0.[illegible]			
$CaCO_3$	%	1.26			

Chief Chemist Date: AUG 3 1954

Form No. 2 Rev. 2M 6-52

d

COLORADO PLATEAU URANIUM ORE PROJECT

AMERICAN SMELTING AND REFINING COMPANY
ORE PURCHASING AGENT FOR
UNITED STATES ATOMIC ENERGY COMMISSION

No. 1758

WEIGHT AND ASSAY CERTIFICATE

MARYSVALE STATION

Shipper: Neal Hartenson A.E.C. License No. K-1875 Shipper's Lot No. Pile No.

Date Weighed	R. R. Car No. Truck Lic. No.	Scale Ticket No.	Mileage	Wet Weight Pounds	H_2O	Dry Weight Pounds	Mining Claim	District	County	State	Pile No.
8.5.54	35577	5771	148	2306032		22322	Lone B Cu 11	Circle Cliff	Garfield	Utah	7
				2306032		22322					

Sampling Foreman: Robert L. Cargill Date: AUG 13 1954

Assays	C.P.U.O.P.	Shipper	Umpire	Settlement
U_3O_8 %	0.14			
V_2O_5 %				
$CaCO_3$ %				

Chief Chemist Date: AUG 20 1954

ATTACHMENT 4(c)

Report on

The Lone B Claim Group

to

The North West Development Company

by

Jasper C. Hicks

Minerals Engineering Company

October 20, 1954

TABLE OF CONTENTS

Title	Page
Location of Property Examined	1
Purpose of Report	1
Conclusions	1
Geology	1
Development	2
Samples	3
Recommendations	3
Wagon Drill Costs	3
Summary	4
Claim Map and Proposed Drill Areas	Appendix A
Map of Underground Workings and Assay Samples	Appendix B
Projection of Shinarump-Moenkopi Contact	Appendix D

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 29 1954

Location of Property Examined

The Lone B claim group is located approximately 150 miles South West of Green River, Utah. These claims are located in Garfield County, Utah, and the local area is known as Circle Cliffs.

The nearest route into the property is from Green River, Utah to Hanksville, Utah for 58 miles. Turn right at Hanksville then go 40 miles on unimproved roads to Notum. Turn left at the Notum junction and proceed 30 miles to the Burr Trail. From the foot of the Burr Trail, it is 19 miles to the Lone B claim group.

Purpose of Report

It is the purpose of this report to determine by surface and sub-surface geologic correlation the feasibility of extending an exploratory program for Uranium.

Conclusions

To date, two drifts which are 210 feet apart have been driven into the contact zone of the Shinarump and Moenkopi formations. Sufficient mineralization was in place on the outcrop to warrant such action and as the drifts advanced, a continuity of Uranium deposition was apparent. The continuity of Uranium deposition in drifts A and B is illustrated by Appendix B of this report. A commercial grade of ore was encountered at intervals in both drifts; however, the depositions are too small to be mined economically.

From the geologic point of view, the present exploration work has been effected in an area consisting of a major channel which probably has feeder channels leading into it. It is conceivable to conclude that a precipitation process has removed most of the Uranium from solution in the small feeder channels before those solutions were able to deposit any major amount in the main channel.

This property should definitely be further explored because of there being sufficient indications of greater concentrations of commercial Uranium ore.

The most economical method of further exploring this property is through a wagon drilling program.

Geology

By examination of the exploration drifts on this property, it is apparent that the ore horizon lies on the contact zone of the Shinarump

and Moenkopi formations. The Shinarump is Triassic in geologic age and consists of intermittent beds of sandstone, shale, and conglomerate. The Moenkopi is also Triassic in age and is primarily an impervious shale which is dark red in color. Both the Shinarump and Moenkopi are classified as sedimentary type deposits.

Channeling in this area is thought to have occurred for several different reasons. As seen by Appendix D which is a projection of line AA' on Appendix A, the Shinarump-Moenkopi contact dips 13°, S 20° W. The sudden departure of the contact from the positive or horizontal plane indicates the Moenkopi having been cut into and subsequently filled with Shinarump conglomerates and sands. Near this same area imbricate structure is thought to be in place. This particular type structure illustrates a stacking effect and also indicates the direction of channel flow. The conglomerates in this area show that the heavier portions of the constituent gravels are oriented in the same direction; consequently, by orientation of conglomerate gravels and by apparent imbricate structure, the direction of channel flow at this point was approximately N 70° E.

On the outcrop where drift A and B are located, the orientation of conglomerate gravels indicate that both drifts are cross-cutting a major channel which was generally flowing South. It is also thought that neither drift reached the West flank of this channel. The possibility exists of two or more channels which probably intersect; consequently, it is logical to assume the possibility of a major channel with feeders running into it.

Carbonaceous material, pyrite, and chalcopyrite was found in the contact zone in each drift. Some of this material gave very high radiometric counts; consequently, Uranium in solution probably did, at one time, pass over stationary masses of the aforementioned minerals and subsequently was precipitated from the solution. The amount of precipitation would depend upon the concentration of carbon, pyrite, and chalcopyrite.

A minor fault is present on the Eastern part of the Lone B claims. This fault trends S 20° W and shows vertical displacement of approximately 25 feet. The East side of this fault is the down-thrown side.

Development

The present development consists of two drifts which are approximately 200 feet apart and they were driven nearly parallel on the ore horizon. The drifts are approximately 8' x 8' in size. Drift "A" is 120 feet in length and bears N 76° 24' W. Drift "B" is 84.2 feet in length and bears N 71° 23' W.

Located 67 feet from Station 9 in drift B is a 30 foot prospect hole. In this hole, 3 feet of 0.50$_e$ U_3O_8 was located.

Samples

Channel samples were cut at every point in each drift where radiometric count indicated commercial ore. Geiger Counter readings were taken at 5 feet intervals in each drift on each rib. The Geiger Counter readings and the chemical analysis values are shown in Appendix B of this report.

Recommendations

This property should be further explored by means of a wagon drilling program. Drill holes spaced closely together should be effected in the area immediate to drift "A" and "B". The close hole spacing is advised because of there being small amounts of commercial Uranium located in both drifts.

If commercial Uranium ore is found in any drill hole, adequate drilling should be effected in the immediate area to the extent of defining the possible ore body. This blocking out procedure shouldbe accomplished before moving the drill rig away from this particular area.

For this drill program, an explicit control pattern is not recommended. The drill sites should be picked in accordance with the topographic features and as a consequence the cost of operation will be reduced.

The following drill footages are recommended for Areas 1,2,3, and 4: Area No. 1 - 3000 ft., Area No. 2 - 2300 ft., Area No. 3 - 2700 ft., Area No. 4 - 2000 ft. The location of Areas No. 1 through No. 4 is shown in Appendix A.

It is also recommended that separate samples of drill cuttings be kept for each foot in depth after each hole is within 20 ft. of the Moenkopi bed. If any doubt arises concerning these samples, the hole should be probed radiometrically.

Wagon Drill Costs

For a 5000 ft. minimum footage guarantee the costs per foot are as follows:

Depth	Price Per Foot
0 - 75'	$ 0.75
75 - 125'	1.00
125 - 225'	1.50
225 - plus	2.25

Standby time is $12.00 per hour. The move-in and move-out charge is $100.00 per day.

It is estimated that the total footage necessary to fully explore this area is 10,000 ft. and that the average cost per foot of drilling will be $1.00.

It is also estimated that $5,000.00 worth of road work is necessary for drill sites.

The estimate of total costs is as follows:

10,000 ft. of drilling at $1.00 per foot.....	$10,000.00
Road work for drill sites.....	5,000.00
Move-in and move-out charge.....	500.00
Total	$15,500.00

Summary

A study of the geologic conditions pertaining to the Lone B claim group was made and the conclusions set forth. The geologic conditions indicate the possibility of finding greater concentrations of commercial grade Uranium ore.

A drilling program has been recommended and the areas indicated for concentrated drilling. A wagon drill is suitable for this area. The hole spacing is to be governed by the amount of Uranium found and by the general topography.

Drill cutting samples are to be taken at a one foot interval through the last 20 ft. of each hole. Radiometric hole probing is to be used when needed.

Respectfully submitted,

Jasper C. Hicks
Minerals Engineering Company

JCH:rw

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

DEPARTMENT OF THE INTERIOR
Defense Minerals
RECEIVED
DEC 6 1954

224 New Customhouse
Denver 2, Colorado

December 3, 1954

Memorandum

To: Administrator

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket No. DMEA 3588 (Uranium), North West Development Company, Lone B Mine, Garfield County, Utah

Attached is a claim map showing the location of the proposed exploration drilling on the subject docket.

The claim maps were submitted at a later date than the application, and the attached copy of the map should be included with the copy of the application which is in your file.

W. H. King

W. H. King

Enclosure

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

224 New Customhouse
Denver 2, Colorado

December 3, 1954

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W. H. King

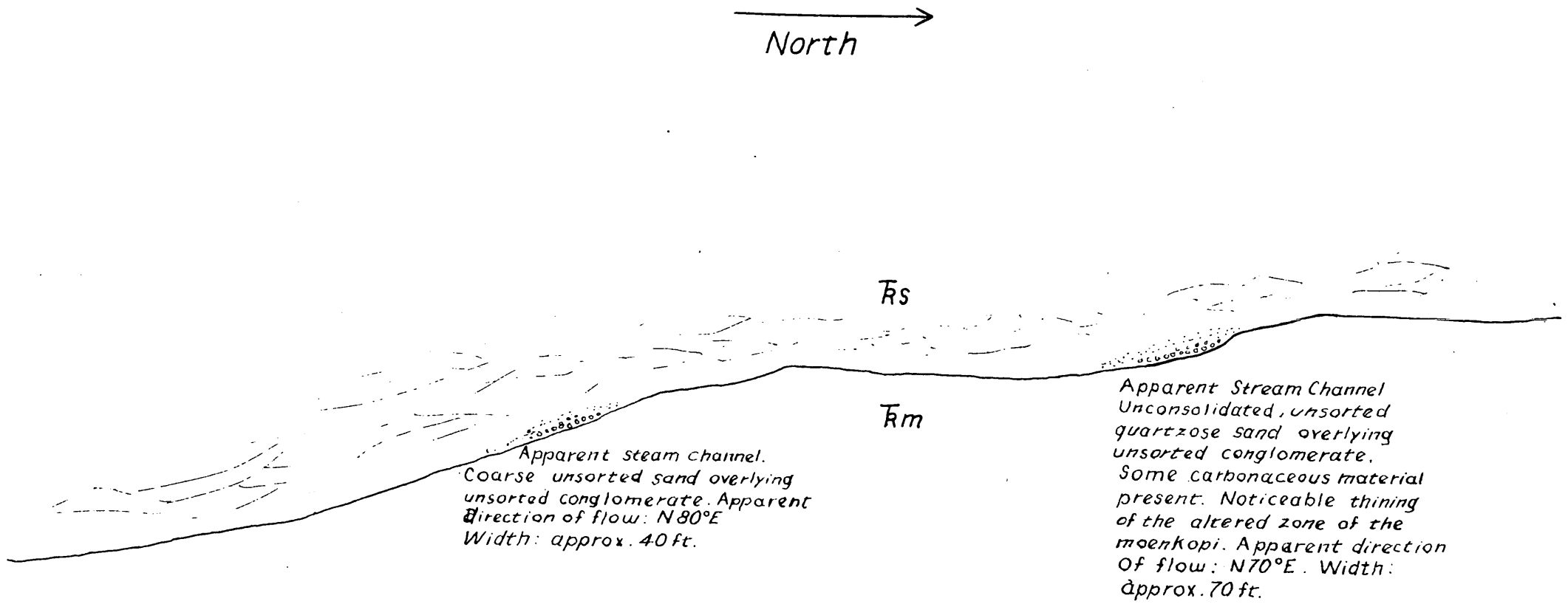
Enclosure

OFFICIAL BUSINESS

U. S. Bureau of Mines
420 Custom House
555 Battery Street
San Francisco 11, California

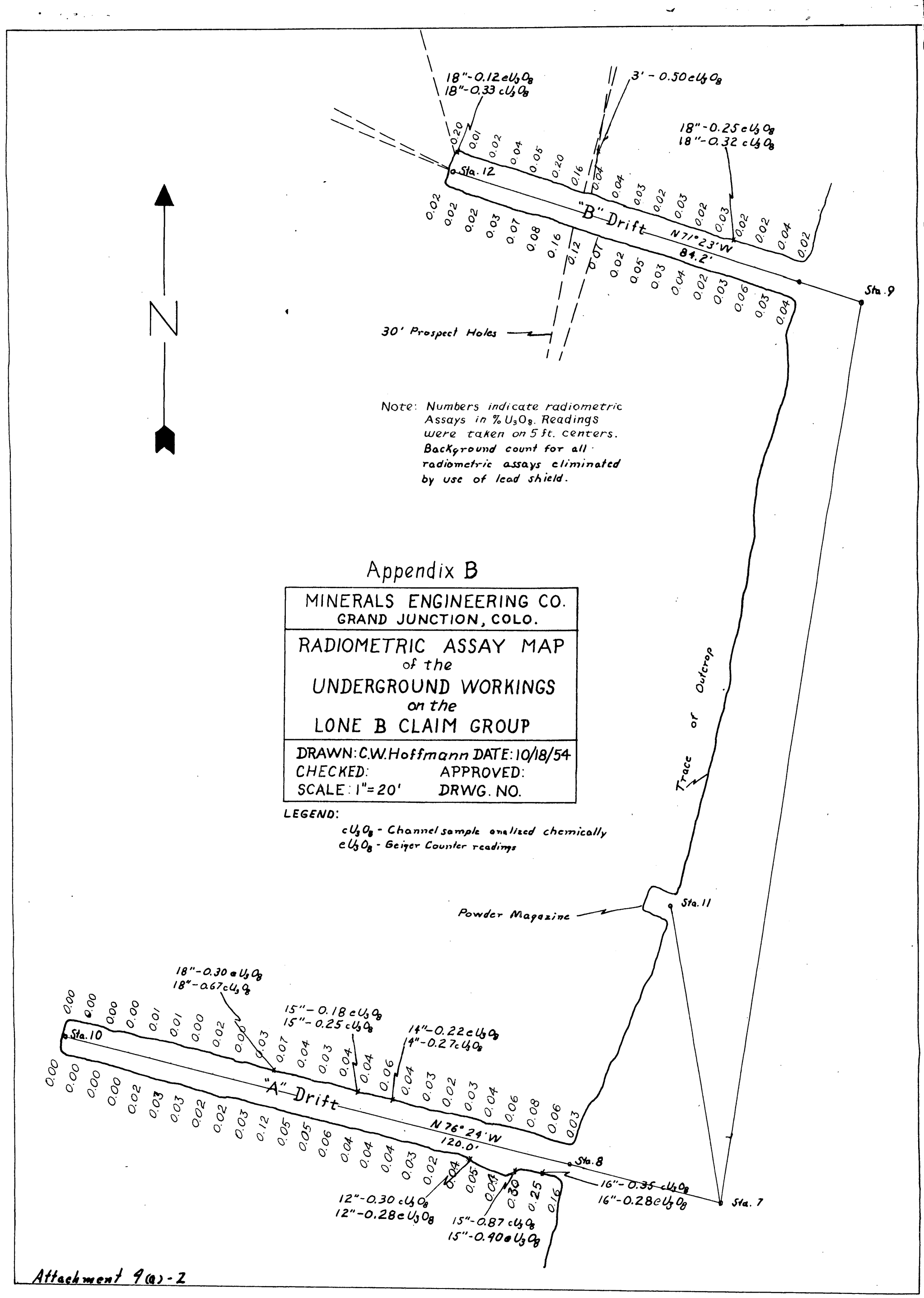
Defense Minerals Exploration Administration

Attachment 4(a)-3



Appendix D
Projection of Contact
Between the Shiarump and Moenkopi
Formations

Projected on Line A-A' (See Appendix A)
Scale: Horizontal: 1"=100'
Vertical: 1"=50'



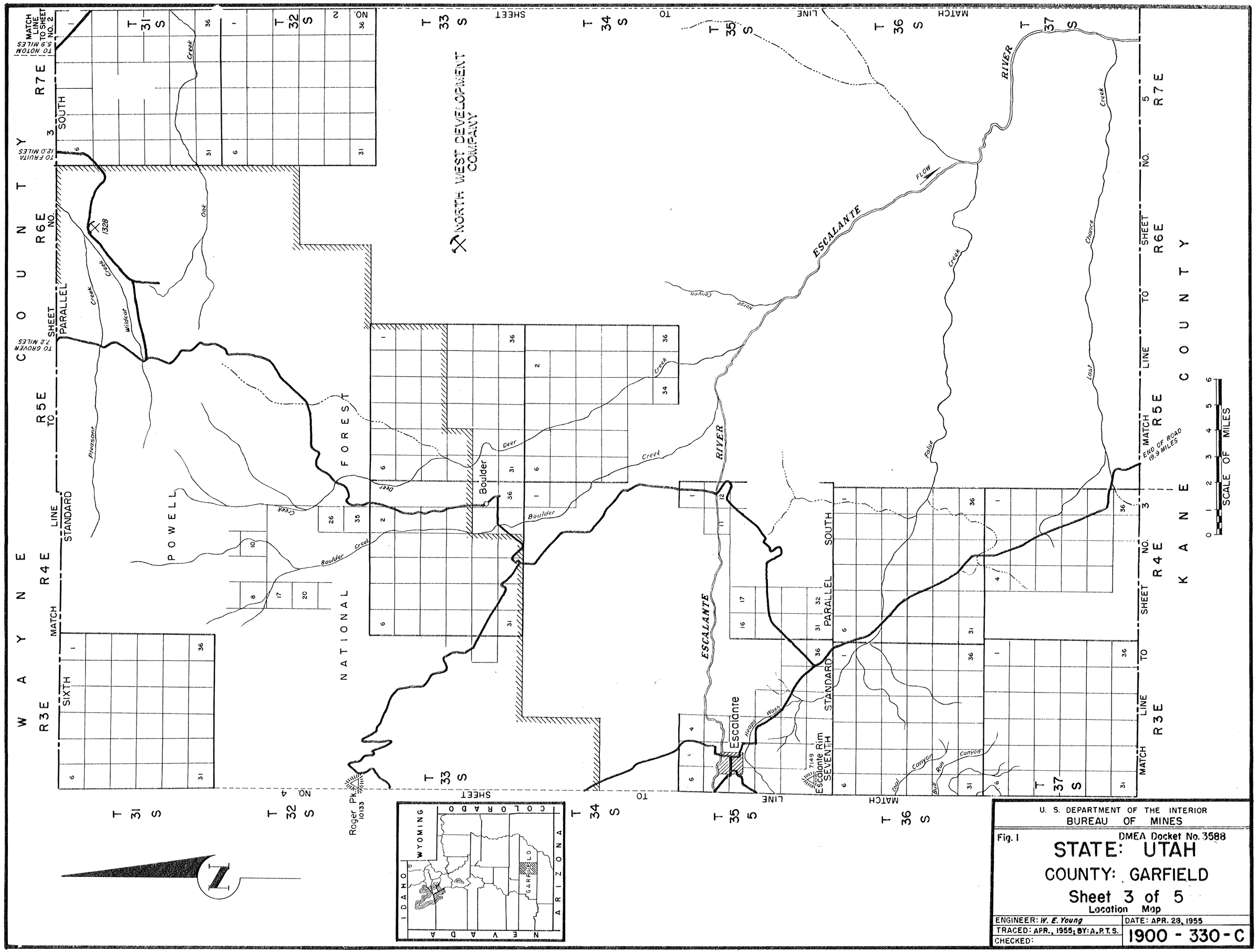
Appendix B

MINERALS ENGINEERING CO. GRAND JUNCTION, COLO.	
RADIOMETRIC ASSAY MAP of the UNDERGROUND WORKINGS on the LONE B CLAIM GROUP	
DRAWN: C.W. Hoffmann	DATE: 10/18/54
CHECKED:	APPROVED:
SCALE: 1" = 20'	DRWG. NO.

LEGEND:

cU3O8 - Channel sample analized chemically
eU3O8 - Geiger Counter readings

Attachment 9(a)-2



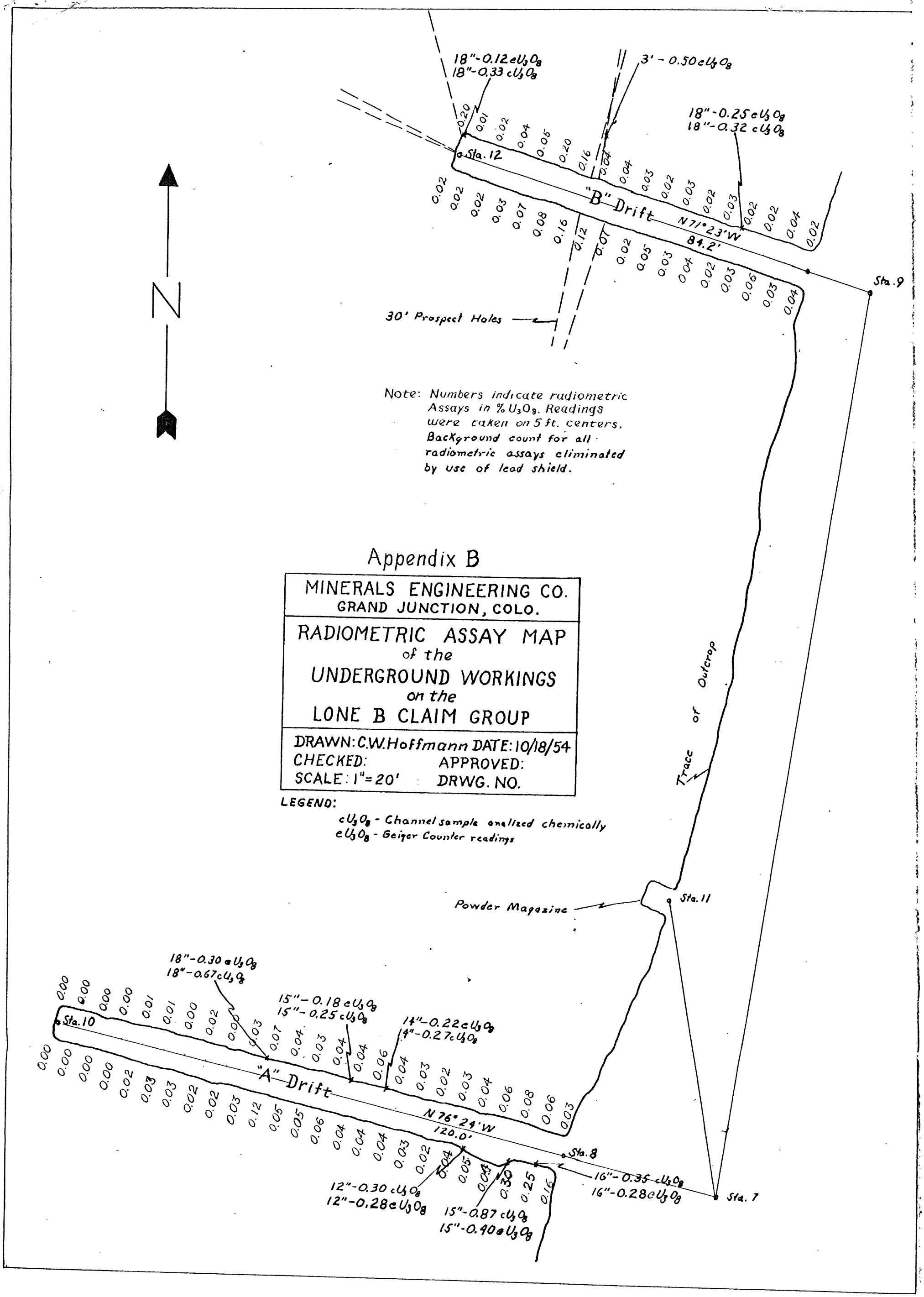
U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Fig. 1

DMEA Docket No. 3588

STATE: UTAH
COUNTY: GARFIELD
Sheet 3 of 5
Location Map

ENGINEER: *W. E. Young*	DATE: APR. 28, 1955
TRACED: APR., 1955; BY: A.P.T.S.	1900 - 330 - C
CHECKED:	



Appendix B

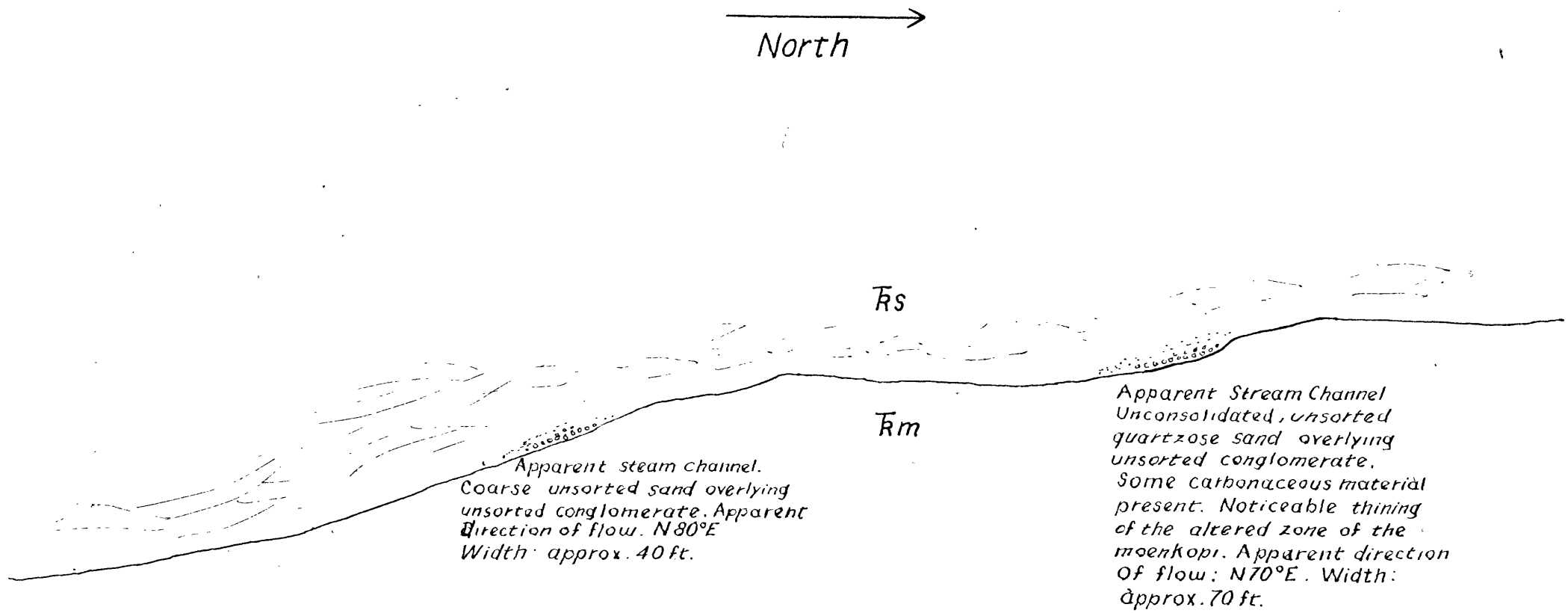
MINERALS ENGINEERING CO.
GRAND JUNCTION, COLO.

RADIOMETRIC ASSAY MAP
of the
UNDERGROUND WORKINGS
on the
LONE B CLAIM GROUP

DRAWN: C.W. Hoffmann DATE: 10/18/54
CHECKED: APPROVED:
SCALE: 1" = 20' DRWG. NO.

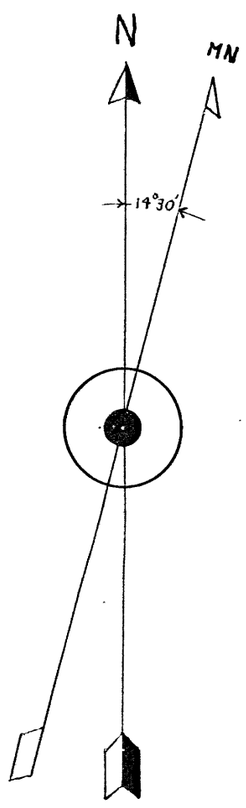
LEGEND:

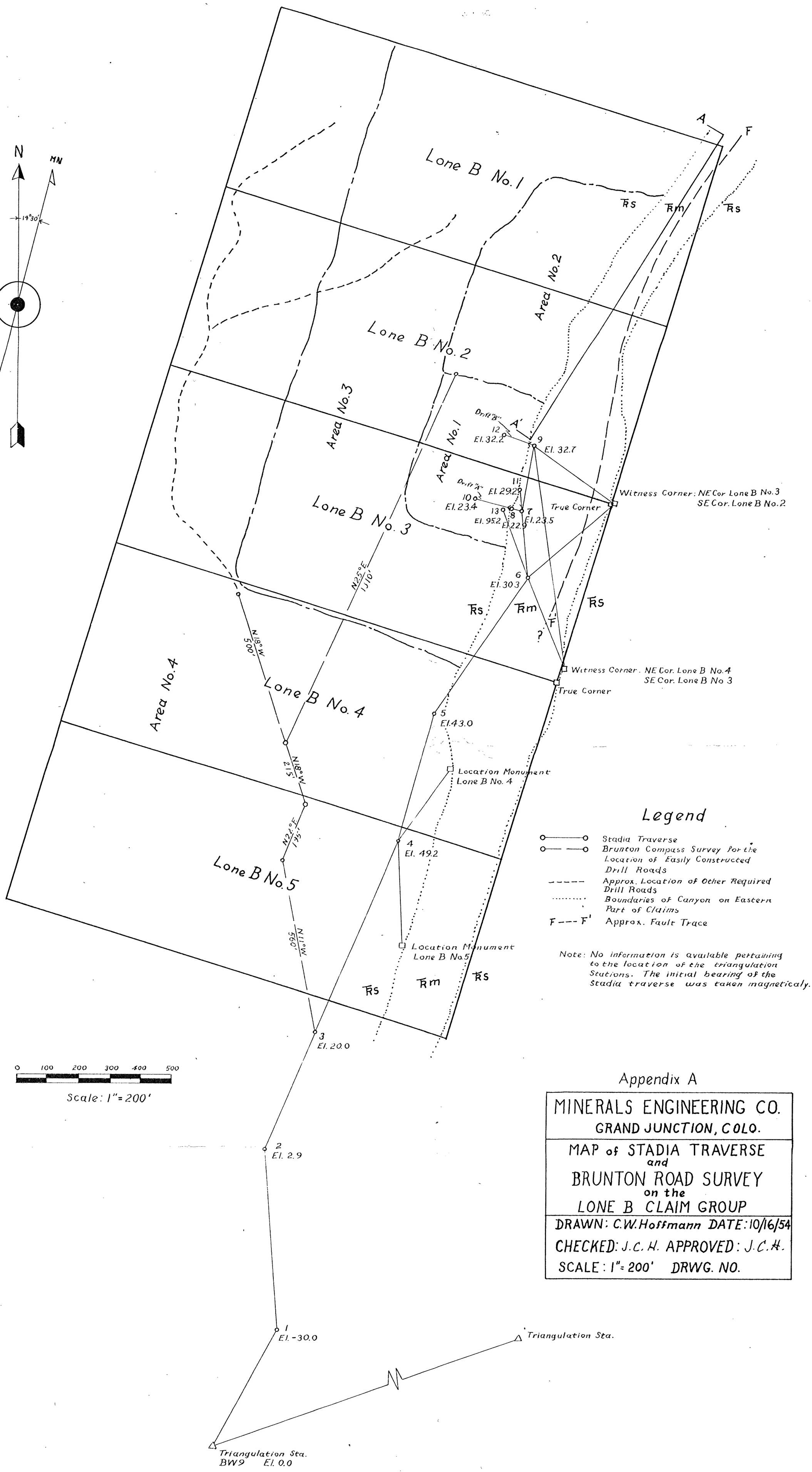
cU_3O_8 - Channel sample analized chemically
eU_3O_8 - Geiger Counter readings



Appendix D
Projection of Contact
Between the Shiarump and Moenkopi
Formations

Projected on Line A-A' (See Appendix A)
Scale: Horizontal: 1" = 100'
Vertical: 1" = 50'





Legend

- Stadia Traverse
- Brunton Compass Survey for the Location of Easily Constructed Drill Roads
- Approx. Location of Other Required Drill Roads
- Boundaries of Canyon on Eastern Part of Claims
- F --- F' Approx. Fault Trace

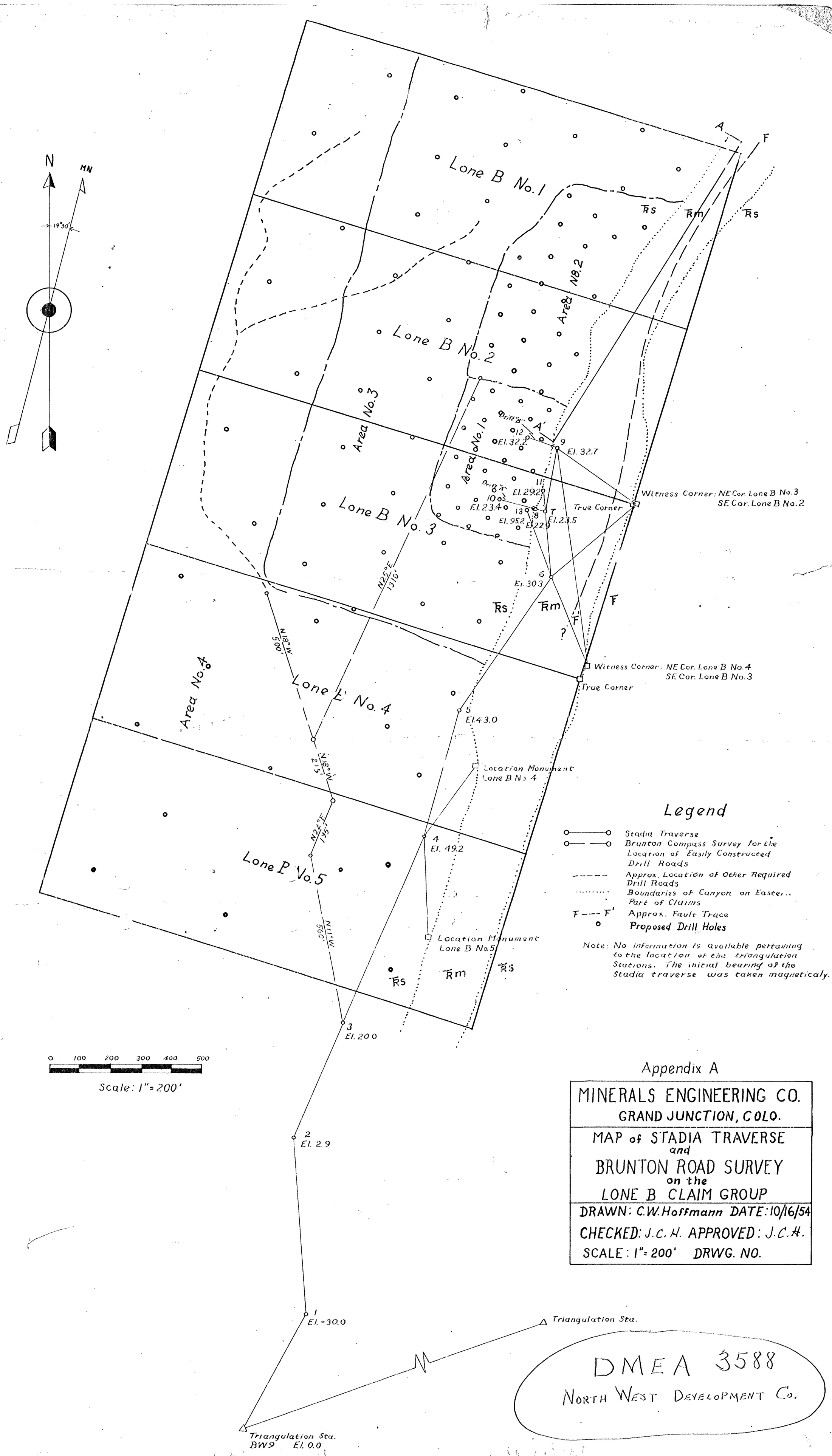
Note: No information is available pertaining to the location of the triangulation Stations. The initial bearing of the Stadia traverse was taken magnetically.

Appendix A

MINERALS ENGINEERING CO.
GRAND JUNCTION, COLO.

MAP of STADIA TRAVERSE
and
BRUNTON ROAD SURVEY
on the
LONE B CLAIM GROUP

DRAWN: C.W. Hoffmann DATE: 10/16/54
CHECKED: J.C.H. APPROVED: J.C.H.
SCALE: 1"=200' DRWG. NO.



Attachment 4(a)-1