DMA Form 1

DEFENSE MINERALS ADMINISTRATION
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DMA Docket No. 3420

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Exploration Assistance

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CONTROLLED DOCUMENT

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

JAN 10 1955

Mr. W. H. King, Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: Date of Examination Report
DMEA-3420 - Uranium
Almar Minerals, Inc.
Surital claims
San Juan County, Utah

Dear Mr. King:

This is in response to your memorandum of December 22, 1954, regarding examination report dates. It is agreeable to Washington to consider the date of the transmittal memorandum as being the date of the examination report. However, because of the filing method, we suggest that the various sections of the report be stamped "transmitted" followed by the date of the transmittal memorandum.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (JHB)

Approved:

J. H. Hedges
Member, Bureau of Mines (JHB)

Thor H. Kiilsgaard
Member, Geological Survey (JHB)

GCSelfridge/esf (1/7/55)
cc to: Docket
Admr. R. File
Oper. Committee
Mr. JECrawford, Rm. 3641
Mr. THKiilsgaard, Rm. 5224
Mr. Ellis
Mr. Selfridge
Mr. Hedges

R.C.H.

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

224 New Customhouse
Denver 2, Colorado

December 22, 1954

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Date of Examination Report - Docket DMEA 3420 (Uranium) Almar Minerals, Inc., Surital Claims, San Juan County, Utah

Reference is made to your letter dated December 16, 1954, regarding the dates on examination reports.

We believe that the date of an examination report should be considered to be the date on the transmittal memorandum from the Field Team to the Secretary of the Operating Committee, in the case of dockets that are not within the delegated authority of Region IV.

In the case of dockets which come within the authority delegated to Region IV and which are approved for contract, the date of the memorandum to the Administrator stating that an application has been approved and a contract is being prepared is considered to be the date of the examination report.

If an application which comes within our delegated authority is denied, the date of the memorandum to the Administrator stating that the application has been denied is considered to be the date of the examination report.

Regarding the engineering report for Almar Minerals, it was transmitted to the Regional Office on October 26, 1954. It is the practice in Region IV for the geologist in charge of the field office to transmit the geologic report to the geological member of the Field Team, who in turn transmits the report to the DMEA Field Team. In the case of Almar Minerals the geologic report is dated November 5. It was transmitted to the geologic member of the Field Team on November 16, who in turn transmitted the geologic report to the Field Team on November 25. The engineering report was transmitted by the Branch Chief to the DMEA Field Team on October 26. Both reports were reviewed in the Regional Office and transmitted to the Secretary to the Operating Committee on November 30.

Please advise us if it is agreeable to your office to consider the date of the transmittal memoranda listed above as being the date of the examination report. In that event we should not date any of the component parts of the report.

W. H. King

W. H. King

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

Ching
Ellis
Kulsgaard
Gehon
Selfridge
Johnson

DEC 20 1954

Mr. M. K. Ruddock, Vice-President
Almar Minerals, Inc.
Moab, Utah

Re: Docket No. DMEA-3420 (Uranium)
Surital Claims
San Juan County, Utah

Dear Mr. Ruddock:

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

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

Careful study of all our information 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. Such denial, however, is made without prejudice. In the event specific geologic data of a favorable nature are disclosed through limited drilling or other work on your part, we shall be pleased to consider a new application.

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

Sincerely yours,

C. O. Mittendorf (for)

Administrator

MChing/gla
12-16-54
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. Ching
DMEA Field Team, Region IV (2)

DOCKET COPY

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

Ching
Ellis

December 16, 1954

Summary of Proposed Project

Object: Denial of application for an exploration project.

Docket No. DMEA-3420

Commodity: Uranium

Applicant: Almar Minerals, Inc.
Moab, Utah

Property: 15 unpatented lode claims, Surital 1 through 15, in sections 33 and 34, T. 30 S., R. 24 E., Big Indian Wash Mining District, San Juan County, Utah. Applicant is the owner.

Date of application: July 1, 1954

Amount of application: $49,890.

Work proposed:

Stage I. Six holes on 2,000 ft. centers totaling 7,200 ft. diamond drilling	$23,600.00
Stage II. Six holes on 1,000 ft. centers totaling 7,200 ft. diamond drilling	23,600.00
Bulldozing, supervision, assaying, etc.	2,690.00
Total	$49,890.00

Field Team Report: Dated October 15, 1954. By Gordon W. Weir, USGS, and Carl Belser, USBM.

The basal Chinle is the main uranium-bearing unit in the Big Indian Wash. Although the basal Chinle in the area of the Surital claims is estimated to be an average of 1,200 feet below surface, it is thought to be uranium bearing. The Little Beaver and Utex mines, 3 to 3½ miles to the northeast, are the nearest productive mines in the Chinle formation. A number of large ore deposits have been found in the area.

Because of deep burial of the ore horizon, there is no specific geologic data by which to evaluate the uranium potential of the Surital claims. The Field Team has considerable doubt as to the appropriateness of this property for a DMEA project and recommends denial of the application without prejudice. Should the Applicant submit supplemental geologic data to substantiate the presence of exploration targets on these claims, a new application should be seriously considered.

Commodity Committee Members' Comments:

Bureau of Mines - John E. Crawford, December 9, 1954:

Application reviewed and discussed with AEC representative. Concurs with Field Team's recommendation that the application be denied.

Geological Survey - E. L. Newcomb, December 10, 1954:

Although the present proposal must be regarded as prospecting and denied essentially on that basis, the Applicant should be told that a new application will be considered if new favorable evidence is disclosed in the future by limited drilling undertaken by the Applicant.

Rare and Miscellaneous Metals Division - Michael Ching, December 15, 1954:

The property is situated in a generally favorable area of large deposits, but the favorable horizon is buried so deeply and known deposits and workings are so far distant that no specifically favorable geologic data is available. An exploration project under such circumstances is admittedly risky, but, if successful, the reward could be large. In view of past policy on applications of this type, a denial of this application is in order.

Conclusions and Recommendations:

The depth of the prospective ore horizon and complete lack of specific exploration targets make the proposed project unacceptable. It is recommended, however, that the denial be made without prejudice.

Ernest Wm. Ellis

Ernest Wm. Ellis

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

Selfridge
Johnson
Mittendorf

DEC 16 1954

Mr. W. H. King, Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: DMEA-3420 - Uranium
Almar Minerals, Inc.
Surital claims
San Juan County, Utah

Dear Mr. King:

Occasionally Washington has had difficulty with its correspondence relating to dates of examination reports because they are submitted in three sections: the summary with a date, the Survey's section usually with an earlier date, and the Bureau's section without a date.

The report on this property includes a summary dated October 15, 1954, the Survey's section dated November 5, 1954, and the Bureau's section without a date.

It would facilitate work here if the Bureau's section carried a date or the report carried only one date.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (2B)

Approved:

C. H. JOHNSON
Member, Bureau of Mines (2B)

Thor H. Kiilsgaard
Member, Geological Survey (2B)

GCSelfridge/esf (12/14/54)
cc to: Docket
Admr. R. File
Oper. Committee
Messrs: J. E. Crawford, Rm.3641
T. H. Kiilsgaard, Rm. 5224
Mr. Ellis
Mr. Selfridge

12/13/54 gla

IN REPLY REFER TO:

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

December 10, 1954

Re: DMEA-3420
(Surital & Nan Claims)
San Juan Co., Utah
$39,890
Uranium

Memorandum

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

From: E. L. Newcomb, U. S. Geological Survey

Subject: Concurrence with Field Team recommendation for denial

The Field Team has recommended the applicant's proposed drilling program be denied. They cite as their reasons for denial (1) the depth of the favorable Chinle formation on the applicant's claims, (2) the lack of geologic data on ore trends in the district, and (3) the impossibility of determining specific exploration targets.

Although the present proposal must be regarded as prospecting and denied essentially on that basis, the applicant should be told that a new application will be considered if new favorable evidence is disclosed in the future by limited drilling undertaken by the applicant.

I concur with the Field Team's conclusions and recommend this application be denied.

E. L. Newcomb

E. L. Newcomb

IN REPLY REFER TO:

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

December 10, 1954

Re: DMEA-3420
(Surital & Man Claims)
San Juan Co., Utah
$39,890
Uranium

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I concur with the Field Team's conclusions and recommend this application be denied.

E. L. Newcomb

ELNewcomb:edf

Copy to: Director;s reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641 Interior

IN REPLY REFER TO:

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

December 10, 1954

Re: DMEA-3420
(Burital & Ken Claims)
San Juan Co., Utah
$39,890
Uranium

Memorandum

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ELNewcomb:edf

Copy to: Director;s reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641 Interior

IN REPLY REFER TO:

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

December 10, 1954

Re: DMEA-3420
(Burital & Ken Claims)
San Juan Co., Utah
$39,890
Uranium

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E. L. Newcomb

ELNewcomb:edf

Copy to: Director;s reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641 Interior

12/10/54

Defense Minerals Administration
RECEIVED
DEC 10 1954

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

December 9, 1954

Memorandum

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

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

Subject: DMEA Docket No. 3420, Almar Minerals, Inc., Surital claims, San Juan County, Utah

I have reviewed the application included in the subject docket and have discussed it with Joseph O. Hosted, representative of the Atomic Energy Commission.

We concur with the recommendation of the Field Team that the application involved under the subject docket be denied.

The report has been forwarded to the Chief, Minerals Division, 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.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
DEC 10 1954

December 9, 1954

Memorandum

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Uranium Commodity Committee, Room 4445

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John E. Crawford

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

Atomic Energy Commission
Science Research Administration
RECEIVED
DEC 10 1954

December 9, 1954

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Uranium Commodity Committee, Room 4445

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Uranium Commodity Committee

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

John E. Crawford

Department of the Interior
Defense Minerals Administration
RECEIVED
DEC 3 1954

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

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[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

W H King
[illegible]

E. M. Hawkman
for [illegible]

[illegible]

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

DEC - 3 1954

W S King

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Region IV

Building 20, Room 137
Denver Federal Center
Denver 2, Colorado
October 26, 1954

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: Chief, Mineral Resources Branch, Mining Division, Region IV

Subject: DMEA 3420 (Uranium) Silver Minerals, Inc., (Murital claims) San Juan County, Utah

Enclosed are the original and ten copies of a summary, conclusions, and recommendations by Gordon A. Swair, Geological Survey and Carl Nelson, Bureau of Mines, and of Nelson's engineering report on the above decent.

Nelson concludes the Murital-Sun claims are in an area favorable for the discovery of ore deposits in the basal Chinle formation estimated to lie at a depth of approximately 1,200 feet below surface. The nearest worthwhile production from the horizon is about 4 miles distant, and in drilling on the applicant's group, considerable benefit would accrue to adjoining owners as well as them, should ore be found. He recommends, if it be determined administratively, that such exploration is a function of Defense Minerals Exploration Administration that a revised project, as outlined in his report, acceptable to the applicant and approved by the U. S. Atomic Energy Commission, be set up in a short-form, unit-cost, three-stage contract at an estimated overall cost of $145,740.00, Government participation, 75 percent or $109,305.00.

I concur with his recommendations, but call your attention to the Region IV Field Team's recommendations in the case of DMEA 3264 covering deep core drilling.

In the event a contract is made, both the Murital and Sun group should be included.

The brochure forwarded with your memorandum of August 19, 1954 instructing that a field examination be made and a report submitted is also included.

Wm. Trever

W. N. Trever

WNT/lel

Enclosures

cc. 2-10 DMEA 3420 DMEA Chron.

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver 2, Colorado

November 23, 1954

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Kaufmann

Subject: DMEA Docket 3420, Ahmar Minerals, Inc., Surital Claims, San Juan County, Utah

Enclosed are 11 copies of a geologic report by G. W. Weir of the U. S. Geological Survey covering the above docket.

The Surital claims lie on the lower part of the southwest flank of the Lisbon Valley anticline about 5 miles southwest of the Lisbon Valley fault. The basal part of the Chinle formation, the ore bearing horizon in the Big Indian wash area, is at a depth estimated to be 1100 to 1200 feet below the ground surface. The nearest outcrops of the basal part of the Chinle formation are about 3 miles distant in the vicinity of the Utex - Mi Vida mine and the Hanaphin - Little Beaver property.

Because of the deep burial of the Chinle formation, the lack of geologic data on ore trends in the district and the impossibility of determining specific exploration targets on the Surital claims, it appears that the proposed "exploration" program must be considered as prospecting, an activity not eligible for DMEA assistance.

Although the ore potential of the Ahmar Minerals property cannot be assessed at this time, limited drilling by the owners could establish geologic criteria indicating the presence of definite exploration targets on the Surital claims. Denial of the application for exploration assistance, without prejudice, is therefore recommended. It is suggested that the applicant company be advised that upon the submission of supplemental geologic data to substantiate the presence of exploration targets on the claims, a new application for exploration assistance will be accepted for processing.

E. N. Hackman
for A. H. Kaufmann
Supervising Geologist
Colorado-Wyoming

Enclosures (11)

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

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

November 16, 1954

Memorandum

To: A. H. Koschmann, Supervising Geologist, DMEA Field Team, Region IV

From: Arnold L. Brokaw, District Supervisor

Subject: DMEA 3420, Almar Minerals, Incorporated, Surital claims, San Juan County, Utah

Transmitted herewith are eleven copies of a geologic report by Gordon W. Weir, covering a field examination of the above-referenced application.

Although the Surital claims are located in a region where large uranium ore bodies exist, the property is some distance from known mines. In addition, the principal ore horizon in the lower Chinle formation lies at an estimated depth of 800 feet, which would make drill hole depths about 1200 feet. Because of the extremely "long shot" nature of the proposed exploration, it is recommended that this application be denied in its present form. It may be appropriate to reconsider a revised application on the subject property in the event more geologic information becomes available at some later date.

This application has been brought to the attention of the Exploration Division, U. S. Atomic Energy Commission Operation Office. The Commission has been asked for its help and advice in evaluating the subject properties.

WPW/mlr
Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

W P Williams
For Arnold L. Brokaw

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
SERIES IV

DMEA 3420. Serial Claims

Alnor Minerals, Inc.

San Juan County, Utah

Uranium

Gordon W. Weir, Geologist
Geological Survey

Carl Baker, Mining Engineer
Bureau of Mines

October 15, 1954

Reviewed by
DMEA OPERATING COMMITTEE
12-9-54
(date)

DMEA M20

SURITAL GLAIRE
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

Summary, Conclusions, and Recommendations

By Gordon Weir
Geologist
Geological Survey

Carl Malsor
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

DMEA 1420

SURITAL CLAIMS
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Gordon W. Weir and Carl Palmer

Almar Minerals, Inc., A. M. Paddock, President, 1000 Quinby Building, Los Angeles, California, and M. L. Paddock, Vice-President, Moab, Utah, have applied for a Defense Minerals Exploration Administration loan of $49,990.00 to explore the Surital claims by 14,400 feet of core drilling.

A field investigation was made on September 20, 1954, by an examining team from the Geological Survey and the Bureau of Mines. Jack I. Malilland, represented Almar Minerals, Inc., and accompanied the examining team. W. F. Williams of the Geological Survey discussed and checked the application with members of the Atomic Energy Commission in Grand Junction before the inspection.

The Surital claims lie near the bottom of the southwest flank of the Lisbon Valley anticline and about 5 miles southwest of the Lisbon Valley fault. The strike of the ore-bearing beds is thought to be about N. 12° W. and the dip 1° SW. The surface is nearly flat and consists of Summerville, Entrada, Carmel, and Navajo formations, which are underlain successively by the Kayenta, Wingate, Chinle, and Cutler formations. The Chinle formation, where exposed near the Star mine, is about 400 feet thick and consists of red and gray sandstone, conglomeratic sandstone, and red and green mudstone. The basal part of the Chinle formation consists of about 75 feet of gray sandstone and conglomeratic

sandstone, with minor red and green mudstone. The basal Chinle is the main uranium-bearing unit in the Big Indian Wash. Although the basal Chinle in the area of the Surital claims is estimated to be an average of 1,200 feet below surface, it is thought to be uranium bearing. The basal Chinle in the Utex-Cal Uranium area, 3 to 4 miles northeast, is reported to contain more than 1,500,000 tons of ore with an average grade of about 0.35 percent U_3O_8. No production or development work has been done on the Surital claims. About one-half mile south, some production has been made from the Salt Wash member of the Morrison formation. The Little Beaver and Utex mines, 3 to 3-1/2 miles northeast are the nearest productive mines in the Chinle formation.

The applicant's proposal called for 12 drill holes averaging 1,200 feet in depth, to be drilled in two phases of six holes each. The first stage holes were to be drilled on an east-west line on approximately 2,000-feet centers. The second stage was to be drilled on approximately 1,000-feet centers.

The examining team recommends a modified and enlarged program, acceptable to the applicant, consisting of 35 holes to be drilled in three stages of 6, 14, and 15 holes, respectively. The drilling cost, including bulldozing, surveying, assaying, etc., is estimated as $3.47 a foot, or

Stage I	7,200 feet at $3.47 =	$ 24,984.00
Stage II	16,800 feet at $3.47 =	58,296.00
Stage III	18,000 feet at $3.47 =	62,460.00
Total	42,000 feet at $3.47 =	$145,740.00

Government participation will be 75 percent, or $109,305.00.

UNITED STATES DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, SECRETARY

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

DMEA 3420, Almar Minerals, Incorporated
Surital claims, San Juan County, Utah

Uranium

Geologic report

by

Gordon W. Weir
U. S. Geological Survey

November 5, 1954

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

INTRODUCTION AND SUMMARY

Almar Minerals, Incorporated, Moab, Utah, applied to the Defense Minerals Exploration Administration for a loan to explore by drilling, the basal part of the Chinle formation on the Surital claims nos. 1 through 16, secs. 33, 34, 35, T. 30 S., R. 24 E., San Juan County, Utah (fig. 1). The property was examined on September 21, 1954, by Messrs. Carl Belser, U. S. Bureau of Mines, and W. P. Williams, C. L. Dodson, and G. W. Weir, U. S. Geological Survey, accompanied by Mr. Jack I. McLelland, acting for the applicants.

The applicants proposed a drilling program of two stages: Stage 1, drilling of 6 holes on about 2,000-foot centers to an average depth of about 1,200 feet to make a reconnaissance of the lower part of the Chinle formation; stage 2, drilling of 6 holes on about 1,000-foot centers to an average depth of about 1,200 feet to delineate ground favorable for ore deposits. The applicants' program would require 12 holes totaling 14,400 feet and would cost $49,890. The geologic report accompanying the application suggests that Almar Minerals contemplated a third stage of drilling to find and partly delineate significant ore bodies, but specific plans for a third stage of drilling were not set forth in the application. If the property is appropriate for a DMEA project, the examining team proposes that the applicants' program be modified to consist of three stages: Stage 1, drilling 6 holes on about 1,300-foot centers requiring about 7,500 feet of drilling to make a preliminary appraisal of the ore-bearing part of the Chinle formation; stage 2, drilling 16 holes on about 800-foot centers from stage 1 drill holes requiring about 20,000 feet to determine the distribution of favorable ground; stage 3, drilling a maximum of 15 holes on 150- to 400-foot centers requiring as much as 18,500 feet of drilling to determine the distribution of ore.

Cost of the project for the maximum required footage of about 46,000 feet is tentatively estimated to be about $160,000, of which the Government's share will be about $120,000. Mr. Carl Belser, Bureau of Mines, will submit a separate report on the engineering and cost aspects of the proposed program.

GEOLOGY

The general geologic setting of the Surital claims is shown in figure 2.

Table 1 summarizes the stratigraphy of the formations exposed and underlying the Surital claims. Only the non-ore-bearing Navajo sandstone, Carmel formation, Entrada sandstone and Summerville formation are exposed on the property.

The Chinle formation of Triassic age is the most important host rock for uranium deposits in the district and underlies the Surital claims at a depth of about 800 feet. The Chinle unconformably overlies the Cutler formation of Permian age and is estimated to be about 400-feet thick. It consists of red and green mudstone and red and gray arkosic sandstone and arkosic and lime-pebble conglomeratic sandstone. The basal part of the Chinle is ore-bearing near the rim along Big Indian Wash a few miles to the north and consists mainly of gray sandstone and conglomeratic sandstone with red and green mudstone. The basal part of the Chinle is commonly about 50 to 75 feet thick in the Big Indian Wash-Lisbon Valley mining district.

The Cutler formation of Permian age, which underlies the Chinle, consists mainly of red, purple, and brown mudstone and red, purple and white sandstone and conglomerate. The Chinle-Cutler contact can generally be recognized in core by the first appearance of these lithologic characteristics below the contrasting green mudstone and gray sandstone of the lower Chinle. The top of the Cutler is estimated to be about 1,200 feet below the surface at the Surital claims.

The property lies on the lower part of the southwest flank of the Lisbon Valley anticline about 5 miles southwest of the Lisbon Valley fault. The beds dip about 3° southwesterly.

Table 1.--Generalized stratigraphic section in Big Indian Wash-Lisbon Valley district, San Juan County, Utah

System	Group	Formation	Estimated thickness (ft.)	Lithology
Jurassic	San Rafael	Summerville	60-90	Red and gray shale, thin sandstone; forms slopes.
		Entrada sandstone	250	Light-colored, massive, cliff-forming sandstone.
		Carmel	50	Red, earthy sandstone; thickens westward.
	Glen Canyon	Navajo sandstone	200-300	Light-colored, massive sandstone; cliff-forming; thins eastward.
Jurassic (?)		Kayenta	250	Red sandstone, irregularly bedded; bench-forming.
Upper Triassic		Wingate sandstone	300	Red, massive sandstone, cliff-forming.
		Chinle	400	Red and gray mudstone and sandstone; bench- and slope-forming; ore-bearing in basal part.
Permian		Cutler	1,000-1,500	Red, brown, and purple mudstone, sandstone, and conglomerate; slope- and cliff-forming.
Permian (?) and Pennsylvanian.		Rico and Hermosa	5,000 +	Brown arkosic sandstone, gray marine limestone, gypsum, and salt; base not exposed.

Ore Deposits

The ore-bearing beds of the Chinle formation are not exposed on the Surital claims. North and east of the property along Big Indian Wash and Lisbon Valley the lower part of the Chinle formation contains possibly the greatest number of large uranium deposits known in the United States. Three of these large deposits are being actively mined: The Utex Company's Mi Vida mine discovered by Charles Steen in 1952, the Cal Uranium Company's San Juan shaft discovered by Atomic Energy Commission geologists in 1953, and the Continental Uranium Company's school section 36 mine discovered by company drilling under the direction of Jack O. Jones in 1953. Two other large deposits are being actively developed: The Homestake Mining Company's Richardson claim and Little Beaver property. These deposits have known reserves of from several tens of thousands of tons to over one million tons with an estimated average grade of above 0.3 percent U_3O_8. Future exploration and development of these deposits is expected to increase these reserves. Exploration now in progress shows promise of finding new large deposits in the district. Although large parts of the district are yet untested and the distribution of deposits and favorable ground and the geologic controls of the ore are yet to be determined, it is certain that the Big Indian Wash-Lisbon Valley district has developed into major importance as a uranium mining area.

The Surital claims lie several miles south of the nearest known deposits, the Mi Vida mine and the Little Beaver property. Trends of the deposits or of favorable ground have not been determined and, even if determined, perhaps could not be projected for such a distance. What is known of the habits of uranium deposits in general suggests that they are commonly clustered in irregular elongate areas containing a high percentage of favorable ground. Many geologists on the Colorado Plateau believe that such areas are at least in part controlled by changes of lithology of the ore-bearing beds such as pinchouts, channel scours, or rapid change of facies. Some geologists believe that such areas are at least in part structurally controlled though the details of this type of control must yet be demonstrated. The examining geologist suspects that Big Indian Wash-Lisbon Valley deposits are restricted to an arkosic sandstone and conglomerate facies of the lower Chinle that trends southeasterly perhaps as far as the Dolores River canyon south of Slick Rock, Colorado. The writer further suspects that this facies of the Chinle may have been controlled by the Lisbon Valley-Dolores salt anticlines which trend northwest and which were positive elements during at least part of the Triassic. The width of the facies or hypothetical belt of favorable ground is highly speculative. The writer believes, however, that the Surital claims may be underlain by this facies of lower Chinle favorable for large ore deposits and that it is reasonable to explore the property for large deposits measurable in tens of thousands of tons and with an expectable average grade of about 0.3 percent U_3O_8.

Proposed Exploration

The applicants' proposal is described briefly on page 1. The examining team believes the program should be partly revised so that the area may be more completely tested, if results of the initial drilling are favorable. Mr. Jack S. McLelland, acting for applicants, concurs in this opinion and agrees to the program as described below.

The proposed exploration program consists of drilling in three stages. At the completion of each stage of drilling, logs of all holes drilled and a map showing location and collar elevations of holes drilled are to be provided by the applicant for Government use. At the completion of each stage of drilling, results are to be evaluated, and, if judged unfavorable, succeeding work is not to be done.

All drill holes are estimated to average about 1,200 feet deep. All holes are to be bottomed at the first appearance of the Cutler formation. Initially, holes are to be cored not less than the basal 150 feet of the Chinle; subsequently, the coring interval may be reduced to about the thickness of the ore-bearing beds. Drill-hole diameters should be equivalent to NX core or larger. All core should be boxed, stored, and marked as to hole number, footages, and collar elevation and made accessible to Government examination at any time.

In stage 1, six holes requiring about 7,500 feet are to be drilled on about 1,300 foot centers in the middle of the property. The purpose of this stage of drilling is to make a preliminary appraisal of the ore-bearing part of the Chinle formation. Recommended locations of stage 1 holes are shown on figure 3. Because no topographic maps exist of the area, recommended locations may be less feasible for drill-hole sites than nearby locations.

Thus, holes of stage 1 may be moved as much as 300 feet from designated locations shown on figure 3, exdept that no hole is to be placed closer than 1,000 feet to any other stage 1 hole and no hole is to be closer than 200 feet to the property line. Results of stage 1 will be judged favorable if the drilling shows that a relatively thick lower Chinle containing a high proportion of arkosic sandstone underlies the property.

In stage 2, sixteen holes requiring about 20,000 feet are to be drilled in a grid pattern on about 800-foot centers. Recommended locations of stage 2 holes are shown on figure 3. Because no topographic maps exist of the area, recommended locations may be less feasible than nearby locations. Thus, holes of stage 2 may be moved as much as 200 feet, except that no hole is to be placed closer than 600 feet to any other hole and no hole is to be closer than 200 feet to the property line. The purpose of this stage of drilling is to determine, if possible, the distribution of mineralized and favorable ground. Mineralized holes are defined as holes showing uranium minerals in the core or radioactivity anomalies determined by logging equipment. Favorable holes are holes showing several geologic features in the core commonly associated with ore, such as a) relatively thick basal Chinle (50 feet), b) arkosic sandstone and conglomerate (as opposed to limy siltstone pebble conglomerate), c) gray and green colors (as opposed to red colors), d) sulphides (commonly pyrite), e) vanadium minerals, and f) carbonaceous material. Study of the drill core may augment or otherwise modify this list of suggested criteria of favorable holes.

Results of stage 2 will be judged favorable if a sufficient number of holes are mineralized or favorable so as to suggest the probability of finding a large uranium deposit. In stage 3 a maximum of 15 holes spaced about 150-400 feet from previous mineralized and favorable holes and requiring a maximum of about 18,500 feet are to be drilled. The number and location of holes of stage 3 depend on the results of stages 1 and 2 and on the initial results of stage 3 drilling.

A separate report on the engineering and cost aspects of the program will be submitted by Mr. Carl Belser, U. S. Bureau of Mines.

Conclusions and Recommendations

The Surital claims is a property judged to be possibly favorable for large uranium deposits in the lower part of the Chinle formation. Large deposits, ranging from several tens of thousands to more than one million tons with an average grade of above 0.3 percent U_3O_8, occur in the same district with an uncommonly high frequency.

On the other hand, because of deep burial of the ore horizon there is no specific geologic data by which to evaluate the uranium potential of the Surital claims. The nearest known uranium deposits and outcrop of the ore-bearing beds are more than 3 miles away. The nearest drill hole is about 2 miles away. Exploration drilling on the Surital claims would definitely be of the 'long shot', wildcat type.

An exploration program on the property, as outlined above, if successful, would open up a broad new area for uranium production; and in any event allow the Government to assess more accurately the uranium-producing potential of the district.

Because of the unfavorable characteristics of the property, as outlined above, it is recommended that the application be denied in its present form. It may be appropriate to place the application in abeyance until the applicant furnishes more detailed information about the property to substantiate a revised DMEA application. Additional information could consist of geologic logs and assays of preliminary drill holes drilled by the applicant.

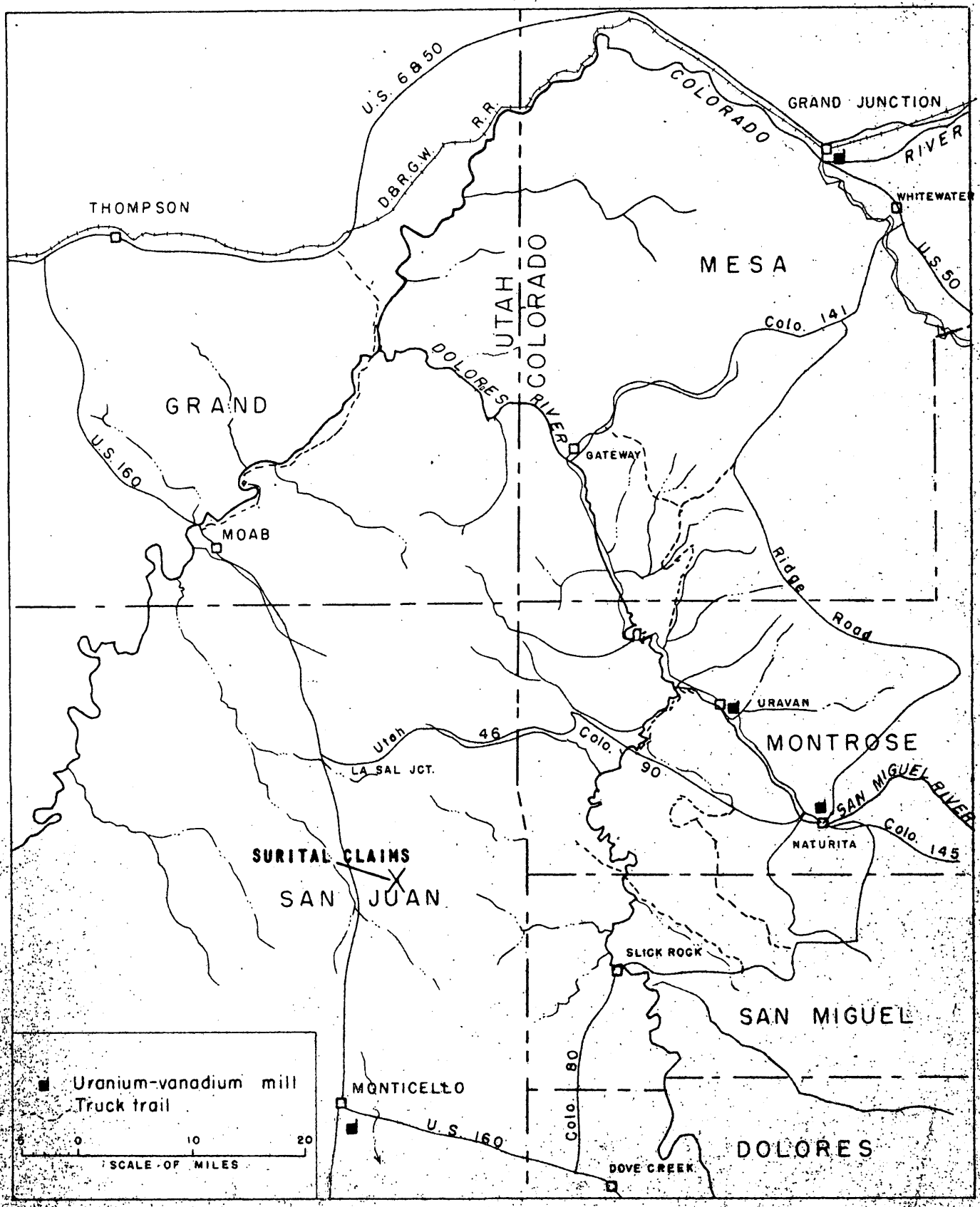

Figure 1. INDEX MAP OF PART OF COLORADO PLATEAU SHOWING LOCATION OF SURITAL CLAIMS ALMAR MINERALS, INC., SAN JUAN COUNTY, UTAH.

DMEA 3430

SURITAL CLAIMS
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

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ILLUSTRATIONS

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2 Claim map, showing proposed exploration, Surital and Nom claims, Almar Minerals, Inc., San Juan County, Utah..... 2

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

DMEA 3420

SERITAL CLAIMS
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

ENGINEERING REPORT

By Carl Balser

INTRODUCTION

Almar Minerals, Inc., Moab, Utah, on July 19, 1954, submitted an application to the Defense Minerals Exploration Administration for aid in an exploration project on the Serital claims in the Big Indian mining district, San Juan County, Utah. The application, DMEA 3420, requested aid in completing 14,400 feet of core drilling at a total estimated cost of $49,890.00--Government participation 75 percent, or $37,417.50. This proposed exploration was to test the lower Chinle formation for uranium mineralization near the Chinle-Cutler contact.

A joint field examination was made by a Geological Survey and Bureau of Mines examining team on September 21, 1954. The examining team, as a result of the investigation, recommended Government assistance in an enlargement of the applicant's proposal of exploratory drilling, provided that the Defense Minerals Exploration Administration considers the deep hole drilling required to be a function of Defense Minerals Exploration Administration.

ACKNOWLEDGMENTS

Jack I. McLelland represented the applicant at the examination and agreed to the amended proposals made by the examining team.

Arnold L. Brokaw, District Supervisor, Geological Survey, Grand Junction, Colo., assigned Gordon W. Weir, geologist, to make the examination as the Geological Survey member of the team. Weir was accompanied by W. F. Williams, geologist, of the Geological Survey, who also discussed phases of the application with members of the Atomic Energy Commission.

LOCATION, TOPOGRAPHY, AND CLIMATE

The Burital claims are adjacent, side to side in an east-west line in secs. 33, 34, and 35, T. 30 S., R. 24 E., Salt Lake meridian, Big Indian mining district, San Juan County, Utah, (figs. 1 and 2). The 15 Man claims, later included in the application, adjoin the Burital claims on the south.

The claims lie in a gently sloping valley through which a fair County road leads from U. S. Highway 160 to Big Indian Wash. From the claims, it is 4 miles to U. S. Highway 160, from whence Monticello is 21 miles south, Moab 37 miles north, and Thompson, on the Denver and Rio Grande Western Railroad is 73 miles north. Ore buying depots are located at Monticello and Thompson, and miners and supplies can be obtained from Moab and Monticello. Altitudes range from about 5,900 to 6,100 feet. Annual rainfall is light and the country is classed as semi-arid. Winter snowfalls seldom exceed 6 inches and mining operations can be maintained the year around. Water suitable for drilling can be obtained from Big Indian Wash. Water for domestic purposes is generally hauled from Moab or Monticello to the mine camps. Native timber and dimension lumber can be purchased at Moab and Monticello.

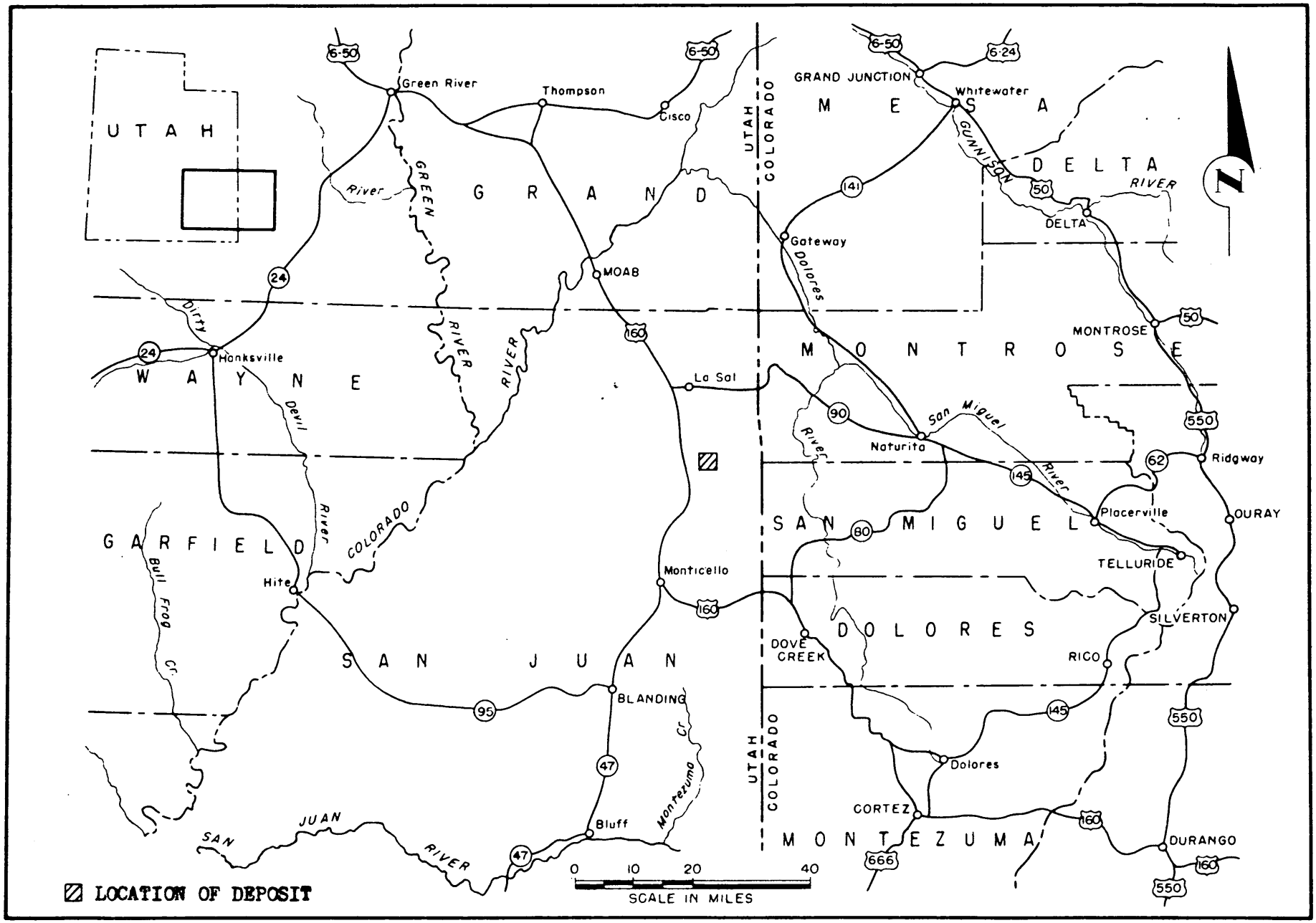

FIGURE 1 - LOCATION MAP, SURITAL CLAIMS, ALMAR MINERALS, INC., SAN JUAN COUNTY, UTAH. (DMEA 3420)

HISTORY AND PRODUCTION

The Marital claims were recorded on March 2, 1954, by George O. Doherty and were transferred to Almar Minerals, Inc. by George and Amalia Doherty on May 24, 1954. No production has been made from the property as no development work has, as yet, been done.

OWNERSHIP AND EXTENT

The property consists of 30 unpatented claims, 15 of which are recorded in the records of the County Recorder of San Juan County as follows:

Name	Book	Page
Marital No. 1	73	410
Marital No. 2	73	411
Marital No. 3	73	412
Marital No. 4	73	413
Marital No. 5	73	414
Marital No. 6	73	415
Marital No. 7	73	416
Marital No. 8	73	417
Marital No. 9	73	418
Marital No.10	73	419
Marital No.11	73	420
Marital No.12	73	421
Marital No.13	73	422
Marital No.14	73	423
Marital No.15	73	424

A quit claim deed for the 15 claims was given to Almar Minerals, Inc. by the locator on May 24, 1954. The other 15 claims, known as the Ken group (Ken No. 1 to Ken No. 15, inclusive), are adjacent to the Marital group and have been located recently. The claims are shown on figure 2.

DESCRIPTION OF THE DEPOSITS

Surface exposures in the Entrada formation indicate flat-dipping, fairly regular Chinle formation at about 1,200 feet below surface. The character of the deposits, if any, is not known.

MINEABLE ORE RESERVES

There are no mineable ore reserves.

PRESENT STATUS

Exploration and Development

There has been no exploration or development done on the property.

Mining and Milling Equipment and Other Facilities

There are no mining or milling equipment presently on the property. The only facility is a County road paralleling the claims from east to west.

PROPOSED EXPLORATION

The applicant proposed to explore the Marital claims with 12 core-drill holes, to be drilled in two phases. Phase I consisted of 6 holes (7,200 feet of drilling), spaced on 2,000-foot centers. Phase II consisted of 6 additional holes spaced between the Phase I holes.

The consulting team suggested that if the property is drilled, it should be done on a more extensive scale as a three-phase project. Phase I to be 6 core-drill holes spaced approximately on

2,000-foot centers, Phase II to be 14 core-drill holes spaced between the Phase I holes on approximately 1,000-foot centers, and Phase III to consist of a maximum of 15 core-drill holes spaced on 250 to 500-foot centers to delineate any ore that may have been discovered by Phase I and Phase II drilling. The location of Phase I and Phase II drill holes is shown on figure 2.

ESTIMATED COST OF PROJECT

The application, as submitted, included all costs except core boxes, bookkeeping, and supervision. It is expected that the Atomic Energy Commission will probe the holes. Drilling costs are based on the G. W. Swank Drilling Company's low bid of $3.25 a foot for drilling, and $10.00 an hour standby time.

Estimated Cost of Core Drilling

Phase I
(Estimated time for completion--1 month)
(7,200 feet of drilling in 8 holes)
Subcontractor's estimate

Independent Contracts		
Core drilling		
7,200 feet at $3.25 a foot	$23,400.00	
Standby		
20 hours at $10.00 per hour	200.00	
Building roads, etc.		
10 hours at $12.00 per hour	120.00	
Total independent contracts		$23,720.00
Labor, supervision, geologist, and surveying		
Labor		
Furnished by independent contractors		
Supervision		
Furnished by applicant at no charge		
Geologist and surveyor		
(Estimated)	375.00	
Total labor, supervision, geologist, and surveying		375.00

Operating materials and supplies		
Furnished by independent contractors		
Operating equipment		
Furnished by independent contractors		
Initial rehabilitation and repairs		
None		
New buildings, improvements, etc.		
None		
Miscellaneous		
Sampling and analysis		
20 samples at $5.00 each	$ 100.00	
Core boxes		
50 core boxes at $1.00 each	50.00	
Total miscellaneous		$ 150.00
Contingencies		750.00
Total estimated cost		$24,995.00
Cost per foot	$3.4715	

Drilling conditions for all three phases are identical.

SUMMARY COST OF PROJECT

Phase I (6 holes--Time 1 month)	
7,200 feet of core-hole drilling at $3.47 a foot	$24,984.00
Phase II (14 holes--Time 2-1/2 months-Subcontractor's estimate)	
16,800 feet of core-hole drilling at $3.47 a foot	58,296.00
Phase III (15 holes--Time 2-1/2 months)	
18,000 feet of core-hole drilling at $3.47 a foot	62,460.00
Total cost of project	$145,740.00

Government participation is 75 percent, or $109,305.00

Total time--6 months

CONCLUSIONS

The Sartral claims are in an area where more core drilling is advisable because of the fine ore deposits that have been opened in the Ptax, Cal Uranium, and other mines. Drilling on the Sartral claims would also be of benefit to owners of nearby claims.

The examining team believes that the Burital claims should be drilled and that the project should be more thorough than the program set forth by the applicant. However, the examining team is uncertain as to whether this application should be classed as a DMEA project.

RECOMMENDATION:

If this application comes under the jurisdiction of the DMEA, it is recommended that a short-form contract, covering both the Burital and Ken claims, be prepared for a three-phase program consisting of:

Phase I

Core drilling a maximum of 7,200 feet (6 holes BX or larger, each cored for 150 feet and located as shown on figure 2).

The recommended cost for 7,200 feet of core drilling is $3.47 a foot, or $24,984.00.

Phase II

Core drilling an additional maximum of 16,800 feet (14 holes BX or larger, each cored for 75 feet and located as shown on figure 2). Prior approval of Phase II drilling by Defense Minerals Exploration Administration, Region IV Field Team is recommended. The recommended cost for 16,800 feet of drilling is $3.47 a foot or $58,296.00.

Phase III

Core drilling an additional maximum of 18,000 feet (15 holes BX or larger, each cored for 75 feet, to delineate possible ore found in Phase I and Phase II drilling. Prior approval of holes by Defense Minerals Exploration Administration, Region IV Field Team is recommended. The recommended cost for 18,000 feet of core drilling is $3.47 a foot, or $62,460.00.

Total cost of project	$145,740.00
Government participation-75 percent	$109,305.00

The applicant's estimate of costs per hole drilled is almost identical to the above, with the exception that core boxes have been added to this estimate, which includes all incidental expenses.

/lei

12/6/54 gla

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
DEC 3 1954

224 New Customhouse
Denver 2, Colorado

November 30, 1954

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Report of Examination, DMEA Docket 3420 (Uranium), Almar Minerals, Inc., Surital and Nan claims, San Juan County, Utah

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

Because of the deep burial of the possible ore horizon there is no specific geologic data by which to evaluate the uranium potential of these claims at this time.

Denial of the application for exploration assistance, without prejudice, is therefore recommended. Should the applicant Company, at some later date, submit supplemental geologic data to substantiate the presence of exploration targets on these claims it is recommended that a new application be accepted.

W H King
W. H. King

for E M Haschmann
A. H. Koschmann

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
DEC - 3 1954

Mining Division
Region IV

224 New Customhouse
Denver 2, Colorado

November 30, 1954

Memorandum

To: DMEA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Report of Examination, DMEA Docket 3420 (Uranium), Almar Minerals, Inc., Surital and Nan claims, San Juan County, Utah.

Enclosed are 11 copies of the engineering report of examination on the subject docket.

The applicant requested $49,890.00 to drill 12 holes averaging 1200 feet in depth through the Chinle formation.

The engineer examiner points out that the nearest productive mines in the Chinle formation are more than 3 miles distant. There is no geologic data to substantiate the presence of exploration targets in these claims.

Denial of the application, without prejudice, is therefore recommended.

W H King
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Region IV

Building 20, Room 137
Denver Federal Center
Denver 2, Colorado
October 26, 1954

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: Chief, Mineral Resources Branch, Mining Division, Region IV

Subject: DMEA 3420 (Uranium) Almar Minerals, Inc., (Surital claims) San Juan County, Utah

Enclosed are the original and ten copies of a Summary, Conclusions, and Recommendations by Gordon W. Weir, Geological Survey and Carl Belser, Bureau of Mines, and of Belser's engineering report on the above docket.

Belser concludes the Surital-Nan claims are in an area favorable for the discovery of ore deposits in the basal Chinle formation estimated to lie at a depth of approximately 1,200 feet below surface. The nearest worthwhile production from the horizon is about 4 miles distant, and in drilling on the applicant's group, considerable benefit would accrue to adjoining owners as well as them, should ore be found. He recommends, if it be determined administratively, that such exploration is a function of Defense Minerals Exploration Administration that a revised project, as outlined in his report, acceptable to the applicant and approved by the U. S. Atomic Energy Commission, be set up in a short-form, unit-cost, three-stage contract at an estimated overall cost of $145,740.00, Government participation, 75 percent or $109,305.00.

I concur with his recommendations, but call your attention to the Region IV Field Team's recommendations in the case of DMEA 3266 covering deep core drilling.

In the event a contract is made, both the Surital and Nan group should be included.

The brochure forwarded with your memorandum of August 19, 1954 instructing that a field examination be made and a report submitted is also included.

W. M. Traver

W. M. Traver

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

WMT/ici

Enclosures

cc: 10 DMEA 3420 DMEA Chron.

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver 2, Colorado

November 26, 1954

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 3420, Almar Minerals, Inc., Surital Claims, San Juan County, Utah

Enclosed are 11 copies of a geologic report by G. W. Weir of the U. S. Geological Survey covering the above docket.

The Surital claims lie on the lower part of the southwest flank of the Lisbon Valley anticline about 5 miles southwest of the Lisbon Valley fault. The basal part of the Chinle formation, the ore bearing horizon in the Big Indian wash area, is at a depth estimated to be 1100 to 1200 feet below the ground surface. The nearest outcrops of the basal part of the Chinle formation are about 3 miles distant in the vicinity of the Utex - Mi Vida mine and the Homestake - Little Beaver property.

Because of the deep burial of the Chinle formation, the lack of geologic data on ore trends in the district and the impossibility of determining specific exploration targets on the Surital claims, it appears that the proposed "exploration" program must be considered as prospecting, an activity not eligible for DMEA assistance.

Although the ore potential of the Almar Minerals property cannot be assessed at this time, limited drilling by the owners could establish geologic criteria indicating the presence of definite exploration targets on the Surital claims. Denial of the application for exploration assistance, without prejudice, is therefore recommended. It is suggested that the applicant company be advised that upon the submission of supplemental geologic data to substantiate the presence of exploration targets on the claims, a new application for exploration assistance will be accepted for processing.

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

E. N. Hawkins
for A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (11)

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

November 16, 1954

Memorandum

To: A. H. Koschmann, Supervising Geologist, DMEA Field Team, Region IV

From: Arnold L. Brokaw, District Supervisor

Subject: DMEA 3420, Almar Minerals, Incorporated, Surital claims, San Juan County, Utah

Transmitted herewith are eleven copies of a geologic report by Gordon W. Weir, covering a field examination of the above-referenced application.

Although the Surital claims are located in a region where large uranium ore bodies exist, the property is some distance from known mines. In addition, the principal ore horizon in the lower Chinle formation lies at an estimated depth of 800 feet, which would make drill hole depths about 1200 feet. Because of the extremely "long shot" nature of the proposed exploration, it is recommended that this application be denied in its present form. It may be appropriate to reconsider a revised application on the subject property in the event more geologic information becomes available at some later date.

This application has been brought to the attention of the Exploration Division, U. S. Atomic Energy Commission Operation Office. The Commission has been asked for its help and advice in evaluating the subject properties.

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

WPW/mlr
Enclosures

W Williams
For Arnold L. Brokaw

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 3420, Surital Claims

Almar Minerals, Inc.

San Juan County, Utah

Uranium

Gordon W. Weir, Geologist
Geological Survey

Carl Belser, Mining Engineer
Bureau of Mines

October 15, 1954

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

DMEA 3420

SURITAL CLAIMS
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

Summary, Conclusions, and Recommendations

By Gordon Weir
Geologist
Geological Survey

Carl Belser
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

DMEA 3420

SURITAL CLAIMS
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Gordon W. Weir and Carl Belser

Almar Minerals, Inc., A. B. Ruddock, President, 1000 Quimby Building, Los Angeles, California, and M. K. Ruddock, Vice-President, Moab, Utah, have applied for a Defense Minerals Exploration Administration loan of $49,890.00 to explore the Surital claims by 14,400 feet of core drilling.

A field investigation was made on September 20, 1954, by an examining team from the Geological Survey and the Bureau of Mines. Jack I. McLelland, represented Almar Minerals, Inc., and accompanied the examining team. W. P. Williams of the Geological Survey discussed and checked the application with members of the Atomic Energy Commission in Grand Junction before the inspection.

The Surital claims lie near the bottom of the southwest flank of the Lisbon Valley anticline and about 5 miles southwest of the Lisbon Valley fault. The strike of the ore-bearing beds is thought to be about N. 12° W. and the dip 1° SW. The surface is nearly flat and consists of Summerville, Entrada, Carmel, and Navajo formations, which are underlain successively by the Kayenta, Wingate, Chinle, and Cutler formations. The Chinle formation, where exposed near the Utex mine, is about 400 feet thick and consists of red and grey sandstone, conglomeratic sandstone, and red and green mudstone. The basal part of the Chinle formation consists of about 75 feet of grey sandstone and conglomeratic

sandstone, with minor red and green mudstone. The basal Chinle is the main uranium-bearing unit in the Big Indian Wash. Although the basal Chinle in the area of the Surital claims is estimated to be an average of 1,200 feet below surface, it is thought to be uranium bearing. The basal Chinle in the Utex-Cal Uranium area, 3 to 4 miles northeast, is reported to contain more than 1,500,000 tons of ore with an average grade of about 0.35 percent U_3O_8. No production or development work has been done on the Surital claims. About one-half mile south, some production has been made from the Salt Wash member of the Morrison formation. The Little Beaver and Utex mines, 3 to 3-1/2 miles northeast are the nearest productive mines in the Chinle formation.

The applicant's proposal called for 12 drill holes averaging 1,200 feet in depth, to be drilled in two phases of six holes each. The first stage holes were to be drilled on an east-west line on approximately 2,000-foot centers. The second stage was to be drilled on approximately 1,000-foot centers.

The examining team recommends a modified and enlarged program, acceptable to the applicant, consisting of 35 holes to be drilled in three stages of 6, 14, and 15 holes, respectively. The drilling cost, including bulldozing, surveying, assaying, etc., is estimated as $3.47 a foot, or

Stage I	7,200 feet	at $3.47 =	$ 24,984.00
Stage II	16,800 feet	at $3.47 =	58,296.00
Stage III	18,000 feet	at $3.47 =	62,460.00
Total	42,000 feet	at $3.47 =	$145,740.00

Government participation will be 75 percent, or $109,305.00.

UNITED STATES DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, SECRETARY

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

DMEA 3420, Almar Minerals, Incorporated
Surital claims, San Juan County, Utah

Uranium

Geologic report

by

Gordon W. Weir
U. S. Geological Survey

November 5, 1954

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

INTRODUCTION AND SUMMARY

Almar Minerals, Incorporated, Moab, Utah, applied to the Defense Minerals Exploration Administration for a loan to explore by drilling, the basal part of the Chinle formation on the Surital claims nos. 1 through 16, secs. 33, 34, 35, T. 30 S., R. 24 E., San Juan County, Utah (fig. 1). The property was examined on September 21, 1954, by Messrs. Carl Belser, U. S. Bureau of Mines, and W. P. Williams, C. L. Dodson, and G. W. Weir, U. S. Geological Survey, accompanied by Mr. Jack I. McLelland, acting for the applicants.

The applicants proposed a drilling program of two stages: Stage 1, drilling of 6 holes on about 2,000-foot centers to an average depth of about 1,200 feet to make a reconnaissance of the lower part of the Chinle formation; stage 2, drilling of 6 holes on about 1,000-foot centers to an average depth of about 1,200 feet to delineate ground favorable for ore deposits. The applicants' program would require 12 holes totaling 14,400 feet and would cost $49,890. The geologic report accompanying the application suggests that Almar Minerals contemplated a third stage of drilling to find and partly delineate significant ore bodies, but specific plans for a third stage of drilling were not set forth in the application. If the property is appropriate for a DMEA project, the examining team proposes that the applicants' program be modified to consist of three stages: Stage 1, drilling 6 holes on about 1,300-foot centers requiring about 7,500 feet of drilling to make a preliminary appraisal of the ore-bearing part of the Chinle formation; stage 2, drilling 16 holes on about 800-foot centers from stage 1 drill holes requiring about 20,000 feet to determine the distribution of favorable ground; stage 3, drilling a maximum of 15 holes on 150- to 400-foot centers requiring as much as 18,500 feet of drilling to determine the distribution of ore.

Cost of the project for the maximum required footage of about 46,000 feet is tentatively estimated to be about $160,000, of which the Government's share will be about $120,000. Mr. Carl Belser, Bureau of Mines, will submit a separate report on the engineering and cost aspects of the proposed program.

GEOLOGY

The general geologic setting of the Surital claims is shown in figure 2.

Table 1 summarizes the stratigraphy of the formations exposed and underlying the Surital claims. Only the non-ore-bearing Navajo sandstone, Carmel formation, Entrada sandstone and Summerville formation are exposed on the property.

The Chinle formation of Triassic age is the most important host rock for uranium deposits in the district and underlies the Surital claims at a depth of about 800 feet. The Chinle unconformably overlies the Cutler formation of Permian age and is estimated to be about 400-feet thick. It consists of red and green mudstone and red and gray arkosic sandstone and arkosic and lime-pebble conglomeratic sandstone. The basal part of the Chinle is ore-bearing near the rim along Big Indian Wash a few miles to the north and consists mainly of gray sandstone and conglomeratic sandstone with red and green mudstone. The basal part of the Chinle is commonly about 50 to 75 feet thick in the Big Indian Wash-Lisbon Valley mining district.

The Cutler formation of Permian age, which underlies the Chinle, consists mainly of red, purple, and brown mudstone and red, purple and white sandstone and conglomerate. The Chinle-Cutler contact can generally be recognized in core by the first appearance of these lithologic characteristics below the contrasting green mudstone and gray sandstone of the lower Chinle. The top of the Cutler is estimated to be about 1,200 feet below the surface at the Surital claims.

The property lies on the lower part of the southwest flank of the Lisbon Valley anticline about 5 miles southwest of the Lisbon Valley fault. The beds dip about 3° southwesterly.

Table 1.--Generalized stratigraphic section in Big Indian Wash-Lisbon Valley district, San Juan County, Utah

System	Group	Formation	Estimated thickness (ft.)	Lithology
Jurassic	San Rafael	Summerville	60-90	Red and gray shale, thin sandstone; forms slopes.
		Entrada sandstone	250	Light-colored, massive, cliff-forming sandstone.
		Carmel	50	Red, earthy sandstone; thickens westward.
	Glen Canyon	Navajo sandstone	200-300	Light-colored, massive sandstone; cliff-forming; thins eastward.
Jurassic (?)		Kayenta	250	Red sandstone, irregularly bedded; bench-forming.
Upper Triassic		Wingate sandstone	300	Red, massive sandstone, cliff-forming.
		Chinle	400	Red and gray mudstone and sandstone; bench- and slope-forming; ore-bearing in basal part.
Permian		Cutler	1,000-1,500	Red, brown, and purple mudstone, sandstone, and conglomerate; slope- and cliff-forming.
Permian (?) and Pennsylvanian.		Rico and Hermosa	5,000 +	Brown arkosic sandstone, gray marine limestone, gypsum, and salt; base not exposed.

Ore Deposits

The ore-bearing beds of the Chinle formation are not exposed on the Surital claims. North and east of the property along Big Indian Wash and Lisbon Valley the lower part of the Chinle formation contains possibly the greatest number of large uranium deposits known in the United States. Three of these large deposits are being actively mined: The Utex Company's Mi Vida mine discovered by Charles Steen in 1952, the Cal Uranium Company's San Juan shaft discovered by Atomic Energy Commission geologists in 1953, and the Continental Uranium Company's school section 36 mine discovered by company drilling under the direction of Jack O. Jones in 1953. Two other large deposits are being actively developed: The Homestake Mining Company's Richardson claim and Little Beaver property. These deposits have known reserves of from several tens of thousands of tons to over one million tons with an estimated average grade of above 0.3 percent U_3O_8. Future exploration and development of these deposits is expected to increase these reserves. Exploration now in progress shows promise of finding new large deposits in the district. Although large parts of the district are yet untested and the distribution of deposits and favorable ground and the geologic controls of the ore are yet to be determined, it is certain that the Big Indian Wash-Lisbon Valley district has developed into major importance as a uranium mining area.

The Surital claims lie several miles south of the nearest known deposits, the Mi Vida mine and the Little Beaver property. Trends of the deposits or of favorable ground have not been determined and, even if determined, perhaps could not be projected for such a distance. What is known of the habits of uranium deposits in general suggests that they are commonly clustered in irregular elongate areas containing a high percentage of favorable ground. Many geologists on the Colorado Plateau believe that such areas are at least in part controlled by changes of lithology of the ore-bearing beds such as pinchouts, channel scours, or rapid change of facies. Some geologists believe that such areas are at least in part structurally controlled though the details of this type of control must yet be demonstrated. The examining geologist suspects that Big Indian Wash-Lisbon Valley deposits are restricted to an arkosic sandstone and conglomerate facies of the lower Chinle that trends southeasterly perhaps as far as the Dolores River canyon south of Slick Rock, Colorado. The writer further suspects that this facies of the Chinle may have been controlled by the Lisbon Valley-Dolores salt anticlines which trend northwest and which were positive elements during at least part of the Triassic. The width of the facies or hypothetical belt of favorable ground is highly speculative. The writer believes, however, that the Surital claims may be underlain by this facies of lower Chinle favorable for large ore deposits and that it is reasonable to explore the property for large deposits measurable in tens of thousands of tons and with an expectable average grade of about 0.3 percent U_3O_8.

Proposed Exploration

The applicants' proposal is described briefly on page 1. The examining team believes the program should be partly revised so that the area may be more completely tested, if results of the initial drilling are favorable. Mr. Jack S. McLelland, acting for applicants, concurs in this opinion and agrees to the program as described below.

The proposed exploration program consists of drilling in three stages. At the completion of each stage of drilling, logs of all holes drilled and a map showing location and collar elevations of holes drilled are to be provided by the applicant for Government use. At the completion of each stage of drilling, results are to be evaluated, and, if judged unfavorable, succeeding work is not to be done.

All drill holes are estimated to average about 1,200 feet deep. All holes are to be bottomed at the first appearance of the Cutler formation. Initially, holes are to be cored not less than the basal 150 feet of the Chinle; subsequently, the coring interval may be reduced to about the thickness of the ore-bearing beds. Drill-hole diameters should be equivalent to NX core or larger. All core should be boxed, stored, and marked as to hole number, footages, and collar elevation and made accessible to Government examination at any time.

In stage 1, six holes requiring about 7,500 feet are to be drilled on about 1,300 foot centers in the middle of the property. The purpose of this stage of drilling is to make a preliminary appraisal of the ore-bearing part of the Chinle formation. Recommended locations of stage 1 holes are shown on figure 3. Because no topographic maps exist of the area, recommended locations may be less feasible for drill-hole sites than nearby locations.

Thus, holes of stage 1 may be moved as much as 300 feet from designated locations shown on figure 3, exdept that no hole is to be placed closer than 1,000 feet to any other stage 1 hole and no hole is to be closer than 200 feet to the property line. Results of stage 1 will be judged favorable if the drilling shows that a relatively thick lower Chinle containing a high proportion of arkosic sandstone underlies the property.

In stage 2, sixteen holes requiring about 20,000 feet are to be drilled in a grid pattern on about 800-foot centers. Recommended locations of stage 2 holes are shown on figure 3. Because no topographic maps exist of the area, recommended locations may be less feasible than nearby locations. Thus, holes of stage 2 may be moved as much as 200 feet, except that no hole is to be placed closer than 600 feet to any other hole and no hole is to be closer than 200 feet to the property line. The purpose of this stage of drilling is to determine, if possible, the distribution of mineralized and favorable ground. Mineralized holes are defined as holes showing uranium minerals in the core or radioactivity anomalies determined by logging equipment. Favorable holes are holes showing several geologic features in the core commonly associated with ore, such as a) relatively thick basal Chinle (50 feet), b) arkosic sandstone and conglomerate (as opposed to limy siltstone pebble conglomerate), c) gray and green colors (as opposed to red colors), d) sulphides (commonly pyrite), e) vanadium minerals, and f) carbonaceous material. Study of the drill core may augment or otherwise modify this list of suggested criteria of favorable holes.

Results of stage 2 will be judged favorable if a sufficient number of holes are mineralized or favorable so as to suggest the probability of finding a large uranium deposit. In stage 3 a maximum of 15 holes spaced about 150-400 feet from previous mineralized and favorable holes and requiring a maximum of about 18,500 feet are to be drilled. The number and location of holes of stage 3 depend on the results of stages 1 and 2 and on the initial results of stage 3 drilling.

A separate report on the engineering and cost aspects of the program will be submitted by Mr. Carl Belser, U. S. Bureau of Mines.

Conclusions and Recommendations

The Surital claims is a property judged to be possibly favorable for large uranium deposits in the lower part of the Chinle formation. Large deposits, ranging from several tens of thousands to more than one million tons with an average grade of above 0.3 percent U_3O_8, occur in the same district with an uncommonly high frequency.

On the other hand, because of deep burial of the ore horizon there is no specific geologic data by which to evaluate the uranium potential of the Surital claims. The nearest known uranium deposits and outcrop of the ore-bearing beds are more than 3 miles away. The nearest drill hole is about 2 miles away. Exploration drilling on the Surital claims would definitely be of the 'long shot', wildcat type.

An exploration program on the property, as outlined above, if successful, would open up a broad new area for uranium production; and in any event allow the Government to assess more accurately the uranium-producing potential of the district.

Because of the unfavorable characteristics of the property, as outlined above, it is recommended that the application be denied in its present form. It may be appropriate to place the application in abeyance until the applicant furnishes more detailed information about the property to substantiate a revised DMEA application. Additional information could consist of geologic logs and assays of preliminary drill holes drilled by the applicant.

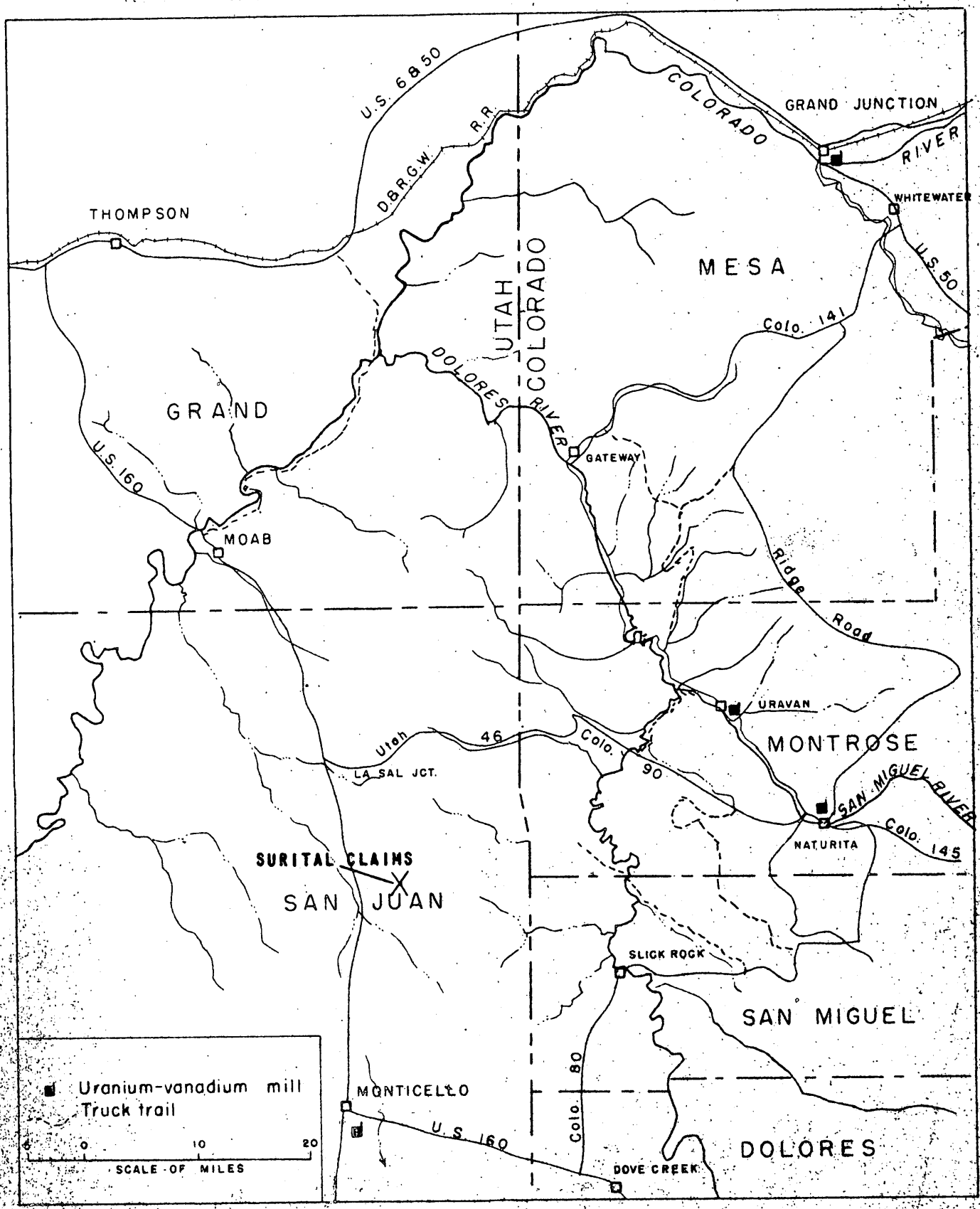

Figure 1. INDEX MAP OF PART OF COLORADO PLATEAU SHOWING LOCATION OF SURITAL CLAIMS ALMAR MINERALS, INC., SAN JUAN COUNTY, UTAH.

DMEA 3420

SURITAL CLAIMS
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

Engineering Report

By Carl Belser
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
12-8-54
(date)

DMEA 3420

SURITAL CLAIMS
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

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ILLUSTRATIONS

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1 Location map, Surital Claims, Almar Minerals, Inc. San Juan County, Utah..... 2
2 Claim map, showing proposed exploration, Surital and Nan claims, Almar Minerals, Inc., San Juan County, Utah..... 2

DMEA 3420

SURITAL CLAIMS
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

ENGINEERING REPORT

By Carl Belser

INTRODUCTION

Almar Minerals, Inc., Moab, Utah, on July 19, 1954, submitted an application to the Defense Minerals Exploration Administration for aid in an exploration project on the Surital claims in the Big Indian mining district, San Juan County, Utah. The application, DMEA 3420, requested aid in completing 14,400 feet of core drilling at a total estimated cost of $49,890.00--Government participation 75 percent, or $37,417.50. This proposed exploration was to test the lower Chinle formation for uranium mineralization near the Chinle-Cutler contact.

A joint field examination was made by a Geological Survey and Bureau of Mines examining team on September 21, 1954. The examining team, as a result of the investigation, recommended Government assistance in an enlargement of the applicant's proposal of exploratory drilling, provided that the Defense Minerals Exploration Administration considers the deep hole drilling required to be a function of Defense Minerals Exploration Administration.

ACKNOWLEDGMENTS

Jack I. McLelland represented the applicant at the examination and agreed to the amended proposals made by the examining team.

Arnold L. Brokaw, District Supervisor, Geological Survey, Grand Junction, Colo., assigned Gordon W. Weir, geologist, to make the examination as the Geological Survey member of the team. Weir was accompanied by W. P. Williams, geologist, of the Geological Survey, who also discussed phases of the application with members of the Atomic Energy Commission.

LOCATION, TOPOGRAPHY, AND CLIMATE

The Surital claims are adjacent, side to side in an east-west line in secs. 33, 34, and 35, T. 30 S., R. 24 E., Salt Lake meridian, Big Indian mining district, San Juan County, Utah, (figs. 1 and 2). The 15 Nan claims, later included in the application, adjoin the Surital claims on the south.

The claims lie in a gently sloping valley through which a fair County road leads from U. S. Highway 160 to Big Indian Wash. From the claims, it is 4 miles to U. S. Highway 160, from whence Monticello is 21 miles south, Moab 37 miles north, and Thompsons, on the Denver and Rio Grande Western Railroad is 73 miles north. Ore buying depots are located at Monticello and Thompsons, and miners and supplies can be obtained from Moab and Monticello. Altitudes range from about 5,900 to 6,100 feet. Annual rainfall is light and the country is classed as semi-arid. Winter snowfalls seldom exceed 6 inches and mining operations can be maintained the year around. Water suitable for drilling can be obtained from Big Indian Wash. Water for domestic purposes is generally hauled from Moab or Monticello to the mine camps. Native timber and dimension lumber can be purchased at Moab and Monticello.

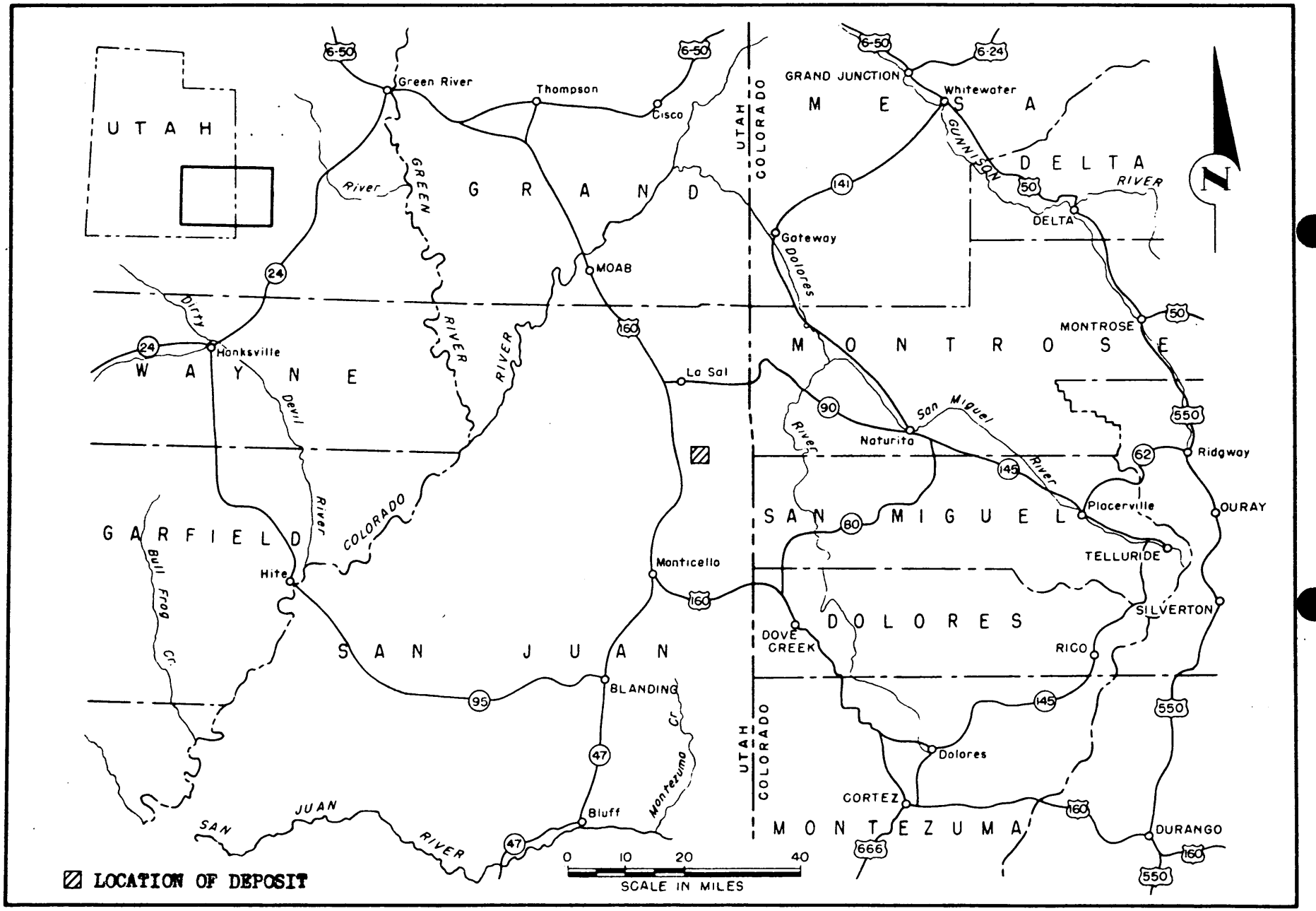

FIGURE 1 - LOCATION MAP, SURITAL CLAIMS, ALMAR MINERALS, INC., SAN JUAN COUNTY, UTAH. (DMEA 3420)

HISTORY AND PRODUCTION

The Surital claims were recorded on March 2, 1954, by George O. Doherty and were transferred to Almar Minerals, Inc. by George and Amelia Doherty on May 24, 1954. No production has been made from the property as no development work has, as yet, been done.

OWNERSHIP AND EXTENT

The property consists of 30 unpatented claims, 15 of which are recorded in the records of the County Recorder of San Juan County as follows:

Name	Book	Page
Surital No. 1	73	410
Surital No. 2	73	411
Surital No. 3	73	412
Surital No. 4	73	413
Surital No. 5	73	414
Surital No. 6	73	415
Surital No. 7	73	416
Surital No. 8	73	417
Surital No. 9	73	418
Surital No.10	73	419
Surital No.11	73	420
Surital No.12	73	421
Surital No.13	73	422
Surital No.14	73	423
Surital No.15	73	424

A quit claim deed for the 15 claims was given to Almar Minerals, Inc. by the locator on May 24, 1954. The other 15 claims, known as the Nan group (Nan No. 1 to Nan No. 15, inclusive), are adjacent to the Surital group and have been located recently. The claims are shown on figure 2.

DESCRIPTION OF THE DEPOSITS

Surface exposures in the Entrada formation indicate flat-dipping, fairly regular Chinle formation at about 1,200 feet below surface. The character of the deposits, if any, is not known.

MINEABLE ORE RESERVES

There are no mineable ore reserves.

PRESENT STATUS

Exploration and Development

There has been no exploration or development done on the property.

Mining and Milling Equipment and Other Facilities

There are no mining or milling equipment presently on the property. The only facility is a County road paralleling the claims from east to west.

PROPOSED EXPLORATION

The applicant proposed to explore the Surital claims with 12 core-drill holes, to be drilled in two phases. Phase I consisted of 6 holes (7,200 feet of drilling), spaced on 2,000-foot centers. Phase II consisted of 6 additional holes spaced between the Phase I holes.

The examining team suggested that if the property is drilled, it should be done on a more extensive scale as a three-phase project. Phase I to be 6 core-drill holes spaced approximately on

2,000-foot centers, Phase II to be 14 core-drill holes spaced between the Phase I holes on approximately 1,000-foot centers, and Phase III to consist of a maximum of 15 core-drill holes spaced on 200 to 500-foot centers to delineate any ore that may have been discovered by Phase I and Phase II drilling. The location of Phase I and Phase II drill holes is shown on figure 2.

ESTIMATED COST OF PROJECT

The application, as submitted, included all costs except core boxes, bookkeeping, and supervision. It is expected that the Atomic Energy Commission will probe the holes. Drilling costs are based on the G. W. Swank Drilling Company's low bid of $3.25 a foot for drilling, and $10.00 an hour standby time.

Estimated Cost of Core Drilling

Phase I
(Estimated time for completion—1 month)
(7,200 feet of drilling in 8 holes)
Subcontractor's estimate

Independent Contracts		
Core drilling		
7,200 feet at $3.25 a foot	$23,400.00	
Standby		
20 hours at $10.00 per hour	200.00	
Bulldozing roads, etc.		
10 hours at $12.00 per hour	120.00	
Total independent contracts		$23,720.00
Labor, supervision, geologist, and surveying		
Labor		
Furnished by independent contractors		
Supervision		
Furnished by applicant at no charge		
Geologist and surveyor		
(Estimated)	375.00	
Total labor, supervision, geologist, and surveying		375.00

Operating materials and supplies			
Furnished by independent contractors			
Operating equipment			
Furnished by independent contractors			
Initial rehabilitation and repairs			
None			
New buildings, improvements, etc.			
None			
Miscellaneous			
Sampling and analysis			
20 samples at $5.00 each		$ 100.00	
Core boxes			
50 core boxes at $1.00 each		50.00	
Total miscellaneous			$ 150.00
Contingencies			750.00
Total estimated cost			$24,995.00
Cost per foot	$3.4715		

Drilling conditions for all three phases are identical.

SUMMARY COST OF PROJECT

Phase I (6 holes--Time 1 month)	
7,200 feet of core-hole drilling at $3.47 a foot	$24,984.00
Phase II (14 holes--Time 2-1/2 months-Subcontractor's estimate)	
16,800 feet of core-hole drilling at $3.47 a foot	58,296.00
Phase III (15 holes--Time 2-1/2 months)	
18,000 feet of core-hole drilling at $3.47 a foot	62,460.00
Total cost of project	$145,740.00

Government participation is 75 percent, or $109,305.00

Total time--6 months

CONCLUSIONS

The Surital claims are in an area where some core drilling is advisable because of the fine ore deposits that have been opened in the Utex, Cal Uranium, and other mines. Drilling on the Surital claims would also be of benefit to owners of nearby claims.

The examining team believes that the Surital claims should be drilled and that the project should be more thorough than the program set forth by the applicant. However, the examining team is uncertain as to whether this application should be classed as a DMEA project.

RECOMMENDATIONS

If this application comes under the jurisdiction of the DMEA, it is recommended that a short-form contract, covering both the Surital and Nan claims, be prepared for a three-phase program consisting of:

Phase I

Core drilling a maximum of 7,200 feet (6 holes BX or larger, each cored for 150 feet and located as shown on figure 2).

The recommended cost for 7,200 feet of core drilling is $3.47 a foot, or $24,984.00.

Phase II

Core drilling an additional maximum of 16,800 feet (14 holes BX or larger, each cored for 75 feet and located as shown on figure 2). Prior approval of Phase II drilling by Defense Minerals Exploration Administration, Region IV Field Team is recommended. The recommended cost for 16,800 feet of drilling is $3.47 a foot or $58,296.00.

Phase III

Core drilling an additional maximum of 18,000 feet (15 holes BX or larger, each cored for 75 feet, to delineate possible ore found in Phase I and Phase II drilling. Prior approval of holes by Defense Minerals Exploration Administration, Region IV Field Team is recommended. The recommended cost for 18,000 feet of core drilling is $3.47 a foot, or $62,450.00.

Total cost of project	$145,740.00
Government participation-75 percent	$109,305.00

The applicant's estimate of costs per hole drilled is almost identical to the above, with the exception that core boxes have been added to this estimate, which includes all incidental expenses.

/ici

10/14/54 gla

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

Defense Minerals Adm
RECEIVED
OCT 14 1954

224 New Customhouse
Denver 2, Colorado

October 11, 1954

Memorandum

To: Secretary to the Operating Committee, DMEA
A. P. Butler
A. Brokaw
W. M. Traver

From: Executive Officer, DMEA Field Team, Region lV

Subject: DMEA Docket 3420 (Uranium), Almar Minerals, Inc.
Surital claims, San Juan County, Utah

Enclosed is a copy of letter from Richard A. Teichman, Geologist for Almar Minerals, Incorporated, in which he transmits a claim map showing location of the Nan group and requests that these claims be included in the subject application.

We have requested the recording data on the Nan group when it is available.

W. H. King

W. H. King

Enclosure

Defense Minerals Administration
RECEIVED
OCT 14 1954

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

224 New Customhouse
Denver 2, Colorado

October 11, 1954

Mr. Richard A. Teichman
Cal Uranium Company
152 East Center Street
Moab, Utah

Re: DMEA Docket 3420 (Uranium)
Almar Minerals, Inc.
Surital claims
San Juan County, Utah

Dear Mr. Teichman:

Receipt is acknowledged of four copies of a map showing the location of the Nan group of claims in relation to the Surital claims.

When recording data on the Nan group is available, please furnish four copies of this information to this office.

Yours very truly,

W. H. King

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

RDB:mn

cc: DMEA Docket 3420
W.M.Traver
A.Brokaw
A.P.Butler
A.H.Koschmann
Sec. to the Oper. Comm.
Chron.

CAL URANIUM COMPANY

[illegible] VALLEY CENTER STREET
MOAB, UTAH

[illegible]

[illegible]
Denver, Colorado

[illegible], 1954

Mr. W.H. King
Executive Officer, DMEA
Field Team IV,
Denver, Colorado.

Dear Mr. King:

In regards to our application for a DMEA loan on the Surita claims, located in the Big Indian Mining District, San Juan County, Utah. We wish to inform you that we have been able to locate fifteen additional claims named Nan [illegible] to 15, inclusive.

We do not intend to apply for DMEA assistance on the Nan group of claims, but we are forwarding four copies of the claim map designed to show the relationship between the Surita claims and the Nan group.

[illegible] the addition of the fifteen Nan [illegible] [illegible] for DMEA loan somewhat [illegible].

[illegible] the Nan claims [illegible] we will forward [illegible] [illegible].

Sincerely,

[illegible]

Richard A. Terzman
Geologist

RT:ep
Encl.

Surname
Docket copy

700

Ching
Ellis
Selfridge
Johnson

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

JUL 27 1954

Mr. W. H. King
Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-3420 (Uranium)
Almar Minerals, Inc.
Surital Claims
San Juan County, Utah

Dear Mr. King:

The subject application is being referred to you for investigation and recommendation. A copy of the application is already in your files.

Enclosed are two copies each of comments and recommendations relative to the application by G. W. Walker, Acting Member, and H. D. Keiser, Member, Uranium Commodity Committee, dated July 20, and July 22, 1954, respectively.

In the event an exploration contract is recommended by the Field Team a Subordination Agreement (Form MF-201, Revised February 1953) should be secured from George C. Doherty and his wife, Emilia A. Doherty.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (JB)

Enclosures 4

APPROVED:

J. H. Hedges
Member, Bureau of Mines (JB)

D. M. Larrabee
Member, Geological Survey (JB)

MChing/gla
7-26-54
cc to: Admr. Reading File
Operating Committee
Docket
Messrs. G. W. Walker, Rm. 3212, GSA
J. O. Hosted, Rm. 3210, GSA
H. D. Keiser, Rm. 3641
Code 700
M.Ching

R.C.

Surname
Docket file

700

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

Ching
Ellis
Lowder
Hedges
Selfridge
H. Johnson

JUL 27 1954

Mr. M. K. Ruddock, Vice-President
Almar Minerals, Inc.
Moab, Utah

Re: Docket No. DMEA-3420 (Uranium)
Surital Claims
San Juan County, Utah

Dear Mr. Ruddock:

The application for assistance in exploring your property, under the above captioned docket number, has been reviewed by the Rare and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. It has been referred for a field examination to the Executive Officer of Region IV at the following address:

Mr. W. H. King
Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

The Regional Office will contact you at the earliest opportunity in regard to your project.

Sincerely yours,

C. O. Mittendorf (Lw)

Administrator

MChing/gla
7-26-54
cc to: Admr. Reading File
Docket
Code 700
Mr. Ching
DMEA Field Team, Region IV (2)

R.C.J.

7/23/54 gla

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

July 22, 1954

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4640

From: H. D. Keiser, Bureau of Mines Member
Uranium Commodity Committee

Subject: DMEA Docket 3420, Almar Minerals, Inc., Moab, Utah.

I have reviewed the application included in the subject docket and have discussed it with Joseph O. Hosted, representative of the Atomic Energy Commission.

It is recommended that the application be referred to the Field Team for investigation and report, and that the Field Team be requested to discuss the application with Ernest R. Gordon, Atomic Energy Commission, Grand Junction, Colorado.

H. D. Keiser

Attachment

STANDARD FORM NO. 64

7/23/54 gla

Office Memorandum • UNITED STATES GOVERNMENT

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

DATE: July 20, 1954

FROM : W. S. Twenhofel, USGS Acting Member, Uranium Commodity Committee

J. W. Walker for

SUBJECT: Application of Almar Minerals Inc., Moab, Utah (Uranium), Surital claims, Big Indian Wash District, San Juan County, Utah

Comment

The applicant proposes to explore by diamond drilling several of the Surital group of claims as more fully identified in the application referred to in the subject above. The proposed exploration is set up in a two stage program consisting of 1) 7,200 feet of diamond drilling in 6 holes spaced on 2,000 foot centers and 2) 7,200 feet of diamond drilling in 6 holes spaced on 1,000 foot centers. The estimated total cost of the proposed exploration is $49,890.

Apparently the applicant proposes to test the lower part of the Chinle formation (Mossback member) and the upper part of the Cutler formation which represent ore horizons in other parts of the Big Indian Wash district and which apparently are overlain by 1,000 feet or more of sedimentary rock on the Surital claims. No specific targets for the proposed exploration, other than the Chinle and Cutler formations, are described in the application.

Geologic information furnished by the applicant, pertaining largely to the Big Indian Wash district rather than to the Surital group of claims, is inadequate to evaluate the merits of the proposed exploration.

Recommendations

1. I recommend that the application be forwarded to the Field Team for review and evaluation especially with respect to 1) whether the Chinle and Cutler formations are apt to be ore-bearing on the Surital claims and 2) whether ore bodies of exploitable size and grade might be expected considering the cost of extracting such ore bodies from depths of 1,000 feet or more.

2. I suggest that the examining members of the Field Team consult with Geologic staffs of the Grand Junction, Colorado offices of the Atomic Energy Commission and Geological Survey to obtain the benefit of any information that they might have.

Copy to: E. Wm. Ellis (2)

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

July 20, 1954

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

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

DMEA - 3420 Almar Minerals Inc.

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

July 20, 1954

Almar Minerals Inc.
Moab
Utah

Subject: DMEA-3420
Re: Exploration Assistance

Gentlemen:

The receipt of your application dated July 1, 1954 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-3420 and referred to the Rare and Miscellaneous Metals Division.

Kindly refer to in any future correspondence relating to your application.

Sincerely yours,

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

224 New Customhouse
Denver 2, Colorado

July 16, 1954.

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Application of Almar Minerals Inc., Moab, Utah (Uranium).

Enclosed are two copies of an application for exploration assistance in the amount of $49,890.00 submitted by the Almar Minerals Inc.

A copy of this application has been sent to Mr. A. P. Butler, Building 21, TEPCO, at the Denver Federal Center.

W. H. King

Enclosures

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

224 New Customhouse
Denver 2, Colorado

July 16, 1954.

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Application of Almar Minerals Inc., Moab, Utah (Uranium).

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A copy of this application has been sent to Mr. A. P. Butler, Building 21, TEPCO, at the Denver Federal Center.

W. H. King

W. H. King

Enclosures

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

OCT 19 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. 3420
Metal or Mineral Uranium
Date Received
Estimated Cost $49,890
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:

ALMAR MINERALS INC.,
Moab, Utah.

(*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.

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

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

See attached sheet

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

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

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

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

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

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

See Attached Sheet

(*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 wish to explore Uranium

(*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 60 days and be completed within 4 months from the date of an exploration project contract.

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

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?

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated July 1, 1954, 195

ALMAR MINERALS INC.
(Applicant)

By Merritt R. Cuddeck

Vice - President

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

Almar Minerals Inc.
Moab, Utah

Form MF-103

DMEA Loan

UNITED STATES DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

1. NAME OF APPLICANT

(a) Almar Minerals, Inc.

Moab, Utah

(b) A Corporation, incorporated in the State of Utah.

(c) Mr. A.B. Ruddock, President

1000 Quimby Bldg.

Los Angeles, California

Mr. M.K. Ruddock, Vice-President

Moab, Utah

Mr. Billings K. Ruddock, Vice-President

1000 Quimby Bldg.

Los Angeles, California

Mr. Edward Neuhoff, Sec'ty - Treasurer

1000 Quimby Bldg.

Los Angeles, California

(d) Not applicable

Almar Minerals Inc,
Moab, Utah.

Form
MF-103

3. APPLICANTS PROPERTY RIGHTS

(a.) 15 unpatented lode claims,i.e. Surital 1 through 15 inclusive. These claims are located in sections 33 and 34, T. 30 S., R. 24 E., in the Big Indian Wash (unorg.) Mining District, San Juan County, Utah.

(b.) None

(c.) The claims for which DMEA assistance is being applied were purchased from Dr. George O. Doherty of Grand Junction, Colorado. Photostatic copies of the deeds, and contracts are attached.

(d.) See above

(e.) Under the contract executed with Doherty, 5% royalty is to be paid out of all ores shipped, but any payment to the government under the provisions of DMEA Order 1, dated March 7, 1952., is to be given precedence over any payment to Doherty. (See attached Exhibit).

ALMAR MINERALS INC.
Moab, Utah.

Form
MF - 103

3. APPLICANTS PROPERTY RIGHTS (CONT.)

(f.)

CLAIM NAME	BOOK NO.	PAGE NO.	COUNTY
Surital #1	73	410	San Juan
Surital #2	73	411	San Juan
Surital #3	73	412	San Juan
Surital #4	73	414	San Juan
Surital #5	73	415	San Juan
Surital #6	73	416	San Juan
Surital #7	73	416	San Juan
Surital #8	73	417	San Juan
Surital #9	73	418	San Juan
Surital #10	73	419	San Juan
Surital #11	73	420	San Juan
Surital #12	73	421	San Juan
Surital #13	73	422	San Juan
Surital #14	73	423	San Juan
Surital #15	73	424	San Juan

4. PHYSICAL DESCRIPTION

(a.) Geological study and surveying

(b.) None

(c.) Please see attached geological report

(d.) Approach roads to the area have been constructed. The town of Moab, Utah, 40 miles to the north over good paved roads is the principal shipping and supply point. Milling facilities are available at the Town of Monticello, Utah, 30 miles to the south over good paved roads, and buying stations and sampling plants are located at Moab and Thompson, Utah.

4. PHYSICAL DESCRIPTION (CONT.)

(e.) Manpower, materials and supplies are readily available from the Town of Moab, Utah.

Water for drilling purposes is available from reservoirs constructed by the AEC and from streams about 8 miles north of the claims. Water for domestic use can be obtained from the Town of La Sal, Utah.

Power must be supplied by a diesel generator.

5. THE EXPLORATION PROJECT

(a.) Uranium ores

(b.) The projected program will consist of reconnaissance and exploration drilling which will be executed in stages.

Stage 1 - Reconnaissance drilling on 2,000 foot centers to an average depth of 1,200 feet. Six holes will be drilled in this stage and will require approximately 7,200 feet of core and non-core type diamond drilling

5. THE EXPLORATION PROJECT (CONT.)

(b.) Continued

Stage 2 - Exploration drilling on approximately 1,000 foot centers to close the grid completed under Stage 1, outlined above. A total of 6 holes will be drilled, temporarily assuming uniform favorability, for an expended drilled footage under this Stage of 7,200 feet. All holes in this stage will avergge 1,200'in depth.
(See attached map)

The minimum total footage to be expended under this contract will be 7,200 feet and the maximum footage will be 14,400 feet, assuming favorable results under first stage drilling.

(c.) Work will commence immediately upon approval of the DMEA Loan by Government officials, or within 60 days of approval, and the program will be completed within 4 months from the date drilling commences.

(d.) Almar Minerals Inc. is currently operating the San Juan Shaft in the Big Indian Wash area. Almar Minerals Inc. is presently conducting other drilling operations on the Plateau.

ALMAR MINERALS INC.,
Moab, Utah.

Form
MF-103

5. THE EXPLORATION PROJECT

(d.) Continued - Mr. Jack I.McLelland, formerly assigned as assistant supervising geologist in the Big Indian Wash area by the USAEC, is Chief Geologist of Almar Minerals Inc. and will conduct the drilling program.

6. ESTIMATE OF COSTS

(a.) Several bids were solicited for the proposed drilling program. The companies submitting bids were the Swank Drilling Company of Moab, Utah, the Brown Drilling Company of Moab and the Moab Drilling Company.

The low bid was submitted by the Swank Drilling Company of Moab, Utah. The average price per foot is # 3.25 for both core and non-core type drilling to depths of 1200 - 1500 feet. Standby time will be charged for at the rate of $10.00 per hour. (See attached bid).

1st Drilling Stage Cost

7200' @ 3.25	$ 23,400.00
Standby, 20 hrs @$10.00	$ 200.00
TOTAL DRILLING COST, STAGE 1	$ 23,600.00

ALMAR MINERALS INC.
Moab, Utah

Form
MF - 103

6. ESTIMATE OF COSTS (CONTINUED)

(a.) cont.

2nd Drilling Stage Cost

7200' @ $3.25	$23,400.00
Standby, 20 hrs @ $10.00	$ 200.00
TOTAL DRILLING COST, STAGE 2	$23,600.00
TOTAL DRILLING COSTS, Stage 1 and 2	$47,200.00
Bulldozer operation, 20 hrs, @ $12.00/hr	$ 240.00
(b) Geologist and Surveyor fees	$ 750.00

(c.) None

(d.) None

(e.) None

(f.) None

(g.) Analytical work

40 samples @ $5.00	$ 200.00
(h.) Contingencies	$ 1,500.00
Total contract cost, assuming drilling of both stages.....	$49,890.00
ALMAR PARTICIPATION @ 25 %	$12,472.22

ALMAR MINERALS INC.,
Maob, Utah.

Form
MF-103

7.

(a.) Almar Minerals Ic. is prepared to furnish its share of the costs of the project.

(b.) Almars share of the costs will be furnished in cash payable upon demand.

CERTIFICATION

Dated July 54

APPLICANT

By Merritt K Kuddock

G.W. Swank Drilling Co.
G.W. Swank, Owner

The following is estimated costs of drilling your property in Big Indian Wash.

1. Collar in Wingate & Kayenta

   Minimum footage of 10,000', core 300'

   Maximum footage of 25,000', core 800'

Will drill and core the above at $2.75 per foot. In the event it is necessary to hold rig on standby time waiting for probe unit, there will be a rate of $10.00 per hour standing. In the event it is necessary to wash out holes there will be a charge of $15.00 per hour for time rig and drill pipe is in use.

2. Big Indian Wash, collar in Navajo.

   Max. footage 40,000' core 1,500'

   Max. depth of 1,500'

   Min. depth of 1,000'

Will drill and core the above at $3.25 per foot. In the event of standby time for probing, or other waiting time. While rig is standing, $ 10.00 per hour. In the event of going in to wash out hole, and rig and drill pipe is used a charge of $15.00 per hour will be made.

G.W. Swank Drilling Co.

Drilling Bid

GEOLOGIC REPORT ON THE SURITAL

CLAIMS 1 - 15

T. 30 S., R. 24 E.

Big Indian Wash Area ,

San Juan County, Utah.

By

Richard A. Teichman Jr.,

and

Jack I. McLelland

June, 1954.

Geologic Report

INTRODUCTION:

During the months of May and June 1954, a reconnaissance of the Surital claims in the south Big Indian wash district was undertaken at the request of ~~the Cal Uranium Company~~ ALMAR MINERALS Co. of Moab, Utah, to determine whether or not sufficient justification existed to recommended the above named properties for a DMEA loan under the provisions of DMEA Order 1, dated March 7, 1952. (Subsequently ammended to provide assistance for uranium exploration in the amount of 75% of the total.)

Specifically the objectives of the reconnaissance were:

1. to assess the potential of the Surital claims, compared to that of surrounding favorable ground.
2. to determine whether or not ore trends could be projected from known productive areas within the district into the area in question
3. to evaluate the information available from surrounding properties to determine the probability of discovering an ore body of commercial size within the confines of the Surital claims.

Approximately three square miles of property were examined during the course of the reconnaissance. Both reporting geologists are thoroughly familiar with the geologic setting of the entire district having been employed in the Big Indian wash area by the United States Atomic Energy Commission until May 1, 1954, as supervising

geologists. One of the reporting geologists has been active in the area since May 1954 as Mine Superintendent at the Cal Uranium Company San Juan Shaft which is operative about 6 miles north and east of the Surital claims.

The Surital claims are located in sections 33 and 34, T. 30 S., R. 24 E., Big Indian Mining District (unorg.), San Juan County, Utah.

LOCATION AND ACCESSIBILITY

Big Indian Wash begins 9 miles south of the town of La Sal, Utah. and extends south from that point for 5 miles. An escarpment parallels the wash for approximately 4 1/2 miles to the point where the wash turns west to drain into the Colorado River. This escarpment contains several mineralized outcrops in the Permian Cutler and Triassic Chinle formations.

The Big Indian Wash area is located within Townships 29, 29 1/2, 30 S., and Ranges 24 and 25 East., Salt Lke. Principal Meridian. From Moab, Utah the Surital claims can be reached by travelling 36 miles south on U.S. Highway 160, a good paved road, thence east for approximately 6 miles to the claims, over a good county maintained graveled road.

Ore from the area is being shipped either 38 miles to the mill at Monticello, Utah, or 60 miles to the buying station at Thompson, Utah. A sampling plant is being constructed at Moab and will be completed shortly.

PAST AND PRESENT MINING ACTIVITY

Three large mines are active in the Big Indian Wash area at the present time. These are:

1. The Cal Uranium Company San Juan Shaft
   (6 miles NNE of the Surital claims)
2. The Utex (Steen) mine
   (4 miles NNE of the Surital claims)
3. The Continental Uranium Co. Mine
   (7 miles SE of the Surital Claims)

In addition to the above listed properties two other large properties are being actively developed in the area. These are :

1. The Little Beaver Property (driving adit)
   (5 1/2 miles NNE of the Surital claims)
2. The Homestake property (sinking a shaft)
   (6 miles NNE of the Surital Claims)

The United States Atomic Energy Commission has a large reconnaissance camp located in the central part of Big Indian wash. The Commission is not now actively engaged in drilling, but the assigned personnel are gathering data and assisting private individuals and companies in their exploration programs. Gamma ray drill hole logging service is also being supplied.

Production of uranium and vanadium ores from the district has been confined to the Permian Cutler formation and the Triassic Chinle formation. The lower portion of the Chinle formation (Mossback) is by far the largest producer. The permian Cutler formation has produced sporadically since 1948, but the ore grade is low and the mines have been inoperative for many months.

During the first World War, the Ohio Copper Company mined a large amount of copper carbonate ore of unknown grade from a deposit located on a fracture zone in the northern part of the wash.

The Utex Exploration Company began producing from the Utex mine in November of 1952 and is using a modified room and pillar method of mining. Very little timber is used in the workings, but a large number of roof bolts have been used to advantage. Production in the Utex mine is from the Mossback member of the Priassic Chinle formation.

The Cal Uranium Company of Moab, Utah, has sunk a two-compartment 'cribbed' shaft into an ore body 6 miles north-northeast of the Surital Claims. Development work has been completed and ore is being shipped on a regular schedule.

The La Sal Mining and Development Co. recently sold its holdings to the Homestake Mining Co. and operation preceding the sinking of a large shaft are underway. The property is located immediately west of the San Juan Shaft. It is anticipated that the Homestake shaft will be sunk to the 600 foot level.

The Continental Uranium Company of Grand Junction, Colo. has located a large ore body in the southern part of Big Indian Wash. Development work has been completed and ore is being

shipped.

GEOMORPHOLOGY AND CLIMATE

The Big Indian Wash district has an elevation ranging from 6,400 feet to 7,100 feet. Two prominent east-facing cuestas (fig. 3) are the major land forms. The western-most cuesta is capped by the Jurassic Wingate sandstone which has been eroded parallel to the stratification of the dipping beds, and is the most important land form. One mile to the northeast, across an alluvium filled valley, is the second prominent cuesta formed by the Hermosa Limestone of the Pennsylvanian. Facing the Hermosa cuesta across the Lisbon Valley is the Burro Canyon memberof the Cretaceous Dakota formation. The Lisbon Valley is formed by the Lisbon Valley fault and shows the amount of displacement along the fault by having Dakota and Hermosa facing each other.

In the Lisbon Valley - Big Indian Wash area, streams are subsequent, intermittent and in a stage of early maturity. Severl obsequent canyons have developed in areas where cross-jointing is prominently developed.

After leaving the valleys the streams are consequent and of late maturity. A trellis pattern is formed by the cuestas. Drainage for the area as a whole displays a dendritic pattern. The northern third of Lisbon Valley drains westward through Big Indian Wash to Hatch Wash, thence to the Colorado River, whereas the southern part of Lisbon Valley drains westward to the Dolores River. The streams in the area are at present in a stage of downcutting due to rejuvenation.

The climate is semi-arid with sparse amounts of rain and snow. Precipitation amounts to less then 20 inches a year.

Vegetation consists of sage and cactus and small pinon and juniper trees.

Working conditions are good throughout the year, although seasonal rains and snows make some roads temporarily impassable.

GEOLOGY

Previous reports on the Big Indian Wash district are:

1. Interim Report on the Examination of Big Indian Wash Uranium Properties, San Juan County, Utah, April 1949, by Charles H. Rasor.

This report recommended that the Pre-Salt Wash formations in the Big Indian Wash district be studied in detail.

2. The Uranium Deposits of Big Indian Wash, January 1953, by George P. Dix, Jr.

This report recommended ~~in~~ investigative drilling program in the Big Indian Wash district.

3. Bureau of Mines Information Circular 7669: Uranium Mining Operations of the Utex Exploration Company in the Big Indian Wash District, San Juan County, Utah, October 19, 1953; By Steen, Dix, Hazen and McLellan.

This report briefly described mining operations, geology and the mineralogy of the Utex mine.

4. Geology and Ore Deposits of the Big Indian Wash District, by Teichman, R., McLelland, J., and Fisk, II, 1954, USAEC. (unpub.)

This report covers the geology and structure of the Big Indian Wash district, and the paragenesis of the areas.

The rocks exposed in the Big Indian Wash district range in age from the Pennsylvanian Hermosa Limestone to

the Jurassic Navajo formation. The principal uranium bearing horizon is a sandstone member in the lower part of the Triassic Chinle formation which has been tentatively identified as the Mossback member of the Chinle formation.

TECTONIC STRUCTURE

Big Indian Wash is located midway between two major laccolithic intrusives; the La Sal Mountains and the Abajo Mountains, and approximately one mile east of the Lisbon Valley-Dolores anticline. The Lisbon Valley-Dolores anticline trends northwest from a point 20 miles east of Upheaval Dome in the Inter River area northwest of Moab, Utah.

Determination of the attitude of and displacement along the Lisbon Valley fault is difficult due to the presence of alluvium in the fault zone. However, present field evidence from crossections and drill hole data show the fault to be hinged at the north and reaching a maximum displacement of approximately 5,000 feet east of the Big Indian Rock, and 'horse tailing' out in the south.

A pronounced joint system is present in the Big Indian Wash district and aerial photographs indicate that in the northern part of the district, where private development is currently centered, the joints strike northwest. In two places, as seen from aerial photographs, closely spaced conjugate joint sets exist. These two areas are in the vicinity of Steen's canyon and the Canyon immediately north of Steen Canyon. This well-developed conjugate joint set doubtless influenced the canyon development.

ECONOMIC GEOLOGY

In the Big Indian Wash area, uranium mineralization is found in the lower part of the Chinle formation (Mossback) and in the upper part of the Permian Cutler formation. The mineralized zone within the Chinle formation is exposed immediately east of the Utex mine. Mineralization within the Cutler formation is confined to 5 arkosic lenses. Four of these lenses are within a hundred feet of the Cutler-Chinle contact and one is within 150 feet of the contact.

CHINLE DEPOSITS

A continuous outcrop of the Chinle ore horizon composed of sandstone, siltstone, and conglomerate extends for eight miles across the Big Indian Wash area, and south into Lisbon Valley. Mineralization has been noted on the rim in the northern, central and southern parts of the area. Five large ore deposits have been discovered during the course of development drilling. (Mentioned previously)

Study of the cores in the northern part of the area indicated that the ore is principally disseminated uraninite, and is confined to closely spaced horizons within the lower Chinle formation (Mossback).

The host rock consists of a gray, medium-grained, poorly cemented, micaceous sandstone, to a gray-green siltstone. The ore horizons are seperated by one to two feet of barren sandstone and siltstone. These barren mudstones are composed of the illite and montmorillonite-type clays. The sandstone contains pyrite and marcasite. Muscovite is found along the bedding planes. Calcite is the most common cementing material, and is accompanied by iron oxides and vanadium minerals.

Thin sections have been cut and autoradiographs made by the United States Atomic Energy Commission of selected ore-bearing samples from the lower part of the Chinle (Mossback) formation. Autoradiographs of the thin sections show a few alpha tracks and clusters originated from black, opaque specks in sltered feldspar grains or on their borders. The following ore and gangue minerals have been identified from the lower Chinle deposits in Big Indian Wash:

carnotite	pyrite	rutile
tyuyamunite	muscovite	zircon
montroseite	othoclase	epidate
doloroseite	chert	garnet
corvusite	quartz	magnetite
uraninite	calcite	pyrolusite
		greenockite
		sphalerite
		galena

Paragenesis shows this depositional order; detritals, authigenic quartz, cement and lastly ore minerals. The cement is made up of several materials: calcite, clay, barite and chlorite. Their times of depositation are possibly simultaneous. One thin section from the Continental Uranium Company deposit is of interest. It shows a pyrite band deposited before the ore minerals on the contact of the fine and coarse textured material, and it has incompletely replaced all detritals and matrix except zircon. Detrital quartz is a abundant in all thin sections except those of the limestone conglomerates. These conglomerates are granule to pebble in size and the presence of quartz-feldspar lenses show the interbraiding of different source material within the lower Chinle (Mossback). The quartz grains show corrosion by earlier solutions than the cement. Calcite is the most abundant cementing material and it replaces feldspars; it in

turn is replaced by later ore minerals. On the basis of paragenesis and ore minerals it can be said that the Mossbake deposits in this area are similar. There are some small differences, however. These are more silica cement, lack of barite and the lack of tyuyamunite in the Continental Uranium Company deposit in the southern part of the wash. These differneces may be small on the basis of further core study.

ORE DEPOSITS

In the discussion of the deposits in the Big Indian Wash area only those deposits in the northern part of the wash will be considered. At present 5 large deposits have been located by drilling and are being actively exploited. They are: (see map)

1. A Steen discovery in the central part of the wash. Approximately 3,500 feet long and 1,500 feet wide. (As of May 1, 1954.)

2. The Cal Uranium - Maimie deposit in the northern part of the wash. Approximately 2,500 feet long and 1,500 feet wide.

3. The Hudson discovery in the northern part of the wash. Approximately 300 feet long and 600 feet wide and as yet undeveloped.

4. The Homestake (Little Beaver) property immediately southwest of the Steen deposit and probably contiguous. Dimensions unknown, but tonnage about 40,000.

5. The Continental Uranium Co. deposit in the extreme southern part of the wash. Extent of the deposit known not, but about 60,000 tons.

The Steen deposit is elongated in a northwesterly direction, and it is the only deposit that shows any degree of

linearity.

It is to be noted that the strike of the other deposits varies radically from one to the other. It appears at this time that a combination of structure and favorable lithology were the basic controls of deposition on the Hudson property.

In using the apparent size of ore bodies to determine drill hole spacings the following criteria have been used:

$$\text{Probability} \approx \frac{\text{target size (size of ore bodies)}}{\text{area of elementary figure (spacing)}}$$

In computing the spacings necessary to find ore on strongly mineralized ground it has been found that initial drill hole spacings of 1,000 feet are more than adequate to explore ground within the Big Indian Wash area. This, of c course, is based on the assumption that the basic central, lithology, is a factor to which no value can be given in outlining a drilling program. Further refinement of a drilling grid based on statistical probability can be had by using to advantage increasing gamma ray values taken from subsurface gamma ray logs through the ore-bearing horizon. The appearance of a favorable lithology, in this case an arkosic sandstone is another factor to be considered in projecting drilling patterns or trends, but this factor has not yet been fully evaluated.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions have been reached during the course of the reconnaissance investigation of the Surital claims:

1. The Surital claims appear to be favorably located with respect to known ore deposits in the Big Indian Wash area. No mines are operative near the property, but mineralization has been observed on outcrops east of the claims. (See attached map).
2. No criteria have yet been developed for the Big Indian wash area which would allow of prediction of ore trends into the area covered by the Surital claims. However, considering the possibility of extension of the mineralization noted on the outcrop to the east of the property, the following is recommended:

    1. It is recommended that a limited exploratory drilling property be conducted upon the property. (Limited considering the depth of hole required to penetrate the ore horizon).
        a. The drilling program should be accomplished in stages; the first stage to consist of 6 holes spaced on 2,000 foot centers to an average depth of 1200 feet.
        b. Should favorable results be encountered during the first drilling stage it is recommended

that stage 2 be drilled. Stage 2 will consist of 6 holes spaced on 1,000 foot centers to an average depth of 1,200 feet, to delineate the favorable ground located under stage 1. (The drilling stage map is idealized)

No drilling has been done in the area immediately surrounding the Surital claims, but both the National Lead Company and the Roberts Construction Company of California plan extensive drilling projects shortly. (See map)

Initial drilling will be designed to locate favorable ground and subsequent drilling to delineate the favorable ground. Due to the depth of hole, no provision has been made at this time for continued drilling in the area beyond stage 2. Evaluation of the results of the two drilling stages will provided the information necessary for further planning

CONTRACT OF SALE

This contract of sale made and entered into on the 27th day of May, 1954, by and between GEORGE O. DOHERTY and [illegible] A. Doherty, his wife, of [illegible] Junction, Utah, hereinafter referred to as SELLERS and ALLOR MINERALS COMPANY, a Utah corporation, hereinafter referred to as BUYER,

WITNESSETH:

WHEREAS, the SELLERS are the owners of certain unpatented mining properties located in San Juan County, State of Utah, and whereas the notices of location are recorded in the County Recorder's of said county and whereas the name, book and page where each of the aforesaid notices is recorded are as follows:

NAME	BOOK	PAGE
Surtal #1	73	410
Surtal #2	73	411
Surtal #3	73	412
Surtal #4	73	413
Surtal #5	73	414
Surtal #6	73	415
Surtal #7	73	416
Surtal #8	73	417
Surtal #9	73	418
Surtal #10	73	419
Surtal #11	73	420
Surtal #12	73	421
Surtal #13	73	422
Surtal #14	73	423
Surtal #15	73	424

WHEREAS, the SELLERS desire to sell the aforesaid mining properties and the BUYER wishes to purchase the same upon the terms and conditions hereinafter provided.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereinafter contained it is agreed as follows:

1. The SELLERS hereby agree to sell to the buyer the above described mining properties and the BUYER agrees to pay therefor

LAW OFFICES
REYNOLDS AND DIXON
21 MAIN STREET
MOAB, UTAH
MOAB 2001

the sum of One thousand one hundred dollars ($1,100.00) as advanced minimum royalty and thereafter the BUYER AGrees to cause to be paid to the SELLERS a five per cent (5%) gross royalty on all ore mined, shipped or sold from the above described mining properties which shall include five per cent (5%) royalty on all bonus or premium payments made by any governmental agency of the United States; provided, however, in calculating the five per cent (5%) gross royalty haulage and development allowances shall be deducted from gross receipts. It is specifically agreed and understood that the five per cent (5%) gross royalty hereinabove provided shall be paid to the SELLERS only from mining operations conducted by the BUYER, ALMAR MINERALS COMPANY or its agents during any period of time when the buyer shall hold title to the properties sold hereunder. In the event that ALMAR MINERALS COMPANY, the BUYER, shall sell the aforesaid mining properties the five per cent (5%) gross royalty hereinabove provided shall terminate, expire and be of no further force or effect upon such a sale; provided, however, in the event of such a sale by the BUYER, the SELLERS shall receive five per cent (5%) of such sale price.

2. It is mutually agreed and understood that the One thousand one hundred dollars ($1,100.00) to be paid to the SELLERS shall be paid upon completion of all necessary staking and filing of notices of lease application ~~[illegible]~~ as her inafter provided.

3. The SELLERS covenant and agree to do all things, to take all steps necessary ~~[illegible]~~ to take advantage of legislation validating the aforesaid mining properties as mining claims.

4. Contemporaneously with the execution of this contract

the SELLERS shall execute a good and sufficient Quit Claim Deed conveying to the BUYER the above described mining properties.

5. This contract is binding upon the heirs, administrators, executors and lawful assigns of the SELLERS and the lawful assigns of the BUYER.

IN WITNESS WHEREOF, the parties hereto have set their hands the day and year first above written.

George O. Doherty
GEORGE O. DOHERTY

Emelia A. Doherty
EMELIA A. DOHERTY
SELLERS

ALMAR MINERALS COMPANY

By _____

BUYER

STATE OF ~~UTAH~~ Colorado
COUNTY OF ~~Grand~~ Pueblo } ss

On the 27 day of May, 1954, personally appeared before me O. DOHERTY and Emelia A. Doherty, the signers of the foregoing instrument, who being first duly sworn, acknowledged to me that they executed the same.

Notary Public, Residing in
~~Grand~~ County
Moab

My Commission Expires:
May 18 1955

STATE OF UTAH)
) ss
COUNTY OF GRAND)

On the _____ day of _____, 1936, personally appeared before me MERRITT K. RUDDOCK, who being by me duly sworn, did say that he is the vice president of ALMAR MINERALS COMPANY, and that said instrument was signed in behalf of said corporation by authority of its by-laws and said MERRITT K. RUDDOCK acknowledged to me that said corporation executed the same.

Notary Public, Residing
in Grand County

My Commission Expires:

QUIT CLAIM DEED

GEORGE O. DOHERTY and [illegible], GRANTORS, hereby forever quit claim to ALMAR MINERALS COMPANY, a Utah Corporation, GRANTEE, for and in consideration of the sum of Ten and no/100 Dollars ($10.00) and other good and valuable consideration all of GRANTORS' right, title and interest in and to the following described unpatented mining properties located in San Juan County, and being as follows, to wit:

NAME	BOOK	PAGE
Surfical #1	73	410
Surfical #2	73	411
Surfical #3	73	412
Surfical #4	73	413
Surfical #5	73	414
Surfical #6	73	415
Surfical #7	73	416
Surfical #8	73	417
Surfical #9	73	418
Surfical #10	73	419
Surfical #11	73	420
Surfical #12	73	421
Surfical #13	73	422
Surfical #14	73	423
Surfical #15	73	424

Together with all metals, ores, gold and silver-bearing quartz, rock and earth, together with all carnotite, uranium, vanadium and fissionable bearing ores located thereon, and all dips and spurs, rights, privileges and franchises, tenements, hereditaments and appurtenances thereto incident or belonging, or therewith used and enjoyed, and all the estate, right, title, interest, property claim and demand whatsoever, legal and equitable, as well in possession as in expectancy, of the GRANTORS, of, in or to said premises, and every part thereof.

WITNESS THE HANDS of the GRANTORS this 27th day of [illegible], 1956.

LAW OFFICES
REYNOLDS AND DIXON
21 MAIN STREET
MOAB, UTAH
MOAB 2001

George O. Doherty
GEORGE O. DOHERTY

Emelia T. Doherty
EMELIA T. DOHERTY

STATE OF ~~UTAH~~ Florida)
) ss
COUNTY OF ~~GRAND~~ Mar)

On the 24th day of May, 1954, personally appeared before me GEORGE O. DOHERTY and EMELIA T. DOHERTY, the signers of the foregoing instrument, who being first duly sworn, acknowledged to me that they executed the same.

Notary Public, Residing in
~~Grand County~~
Fla.

My Commission Expires:
March 18, 1955

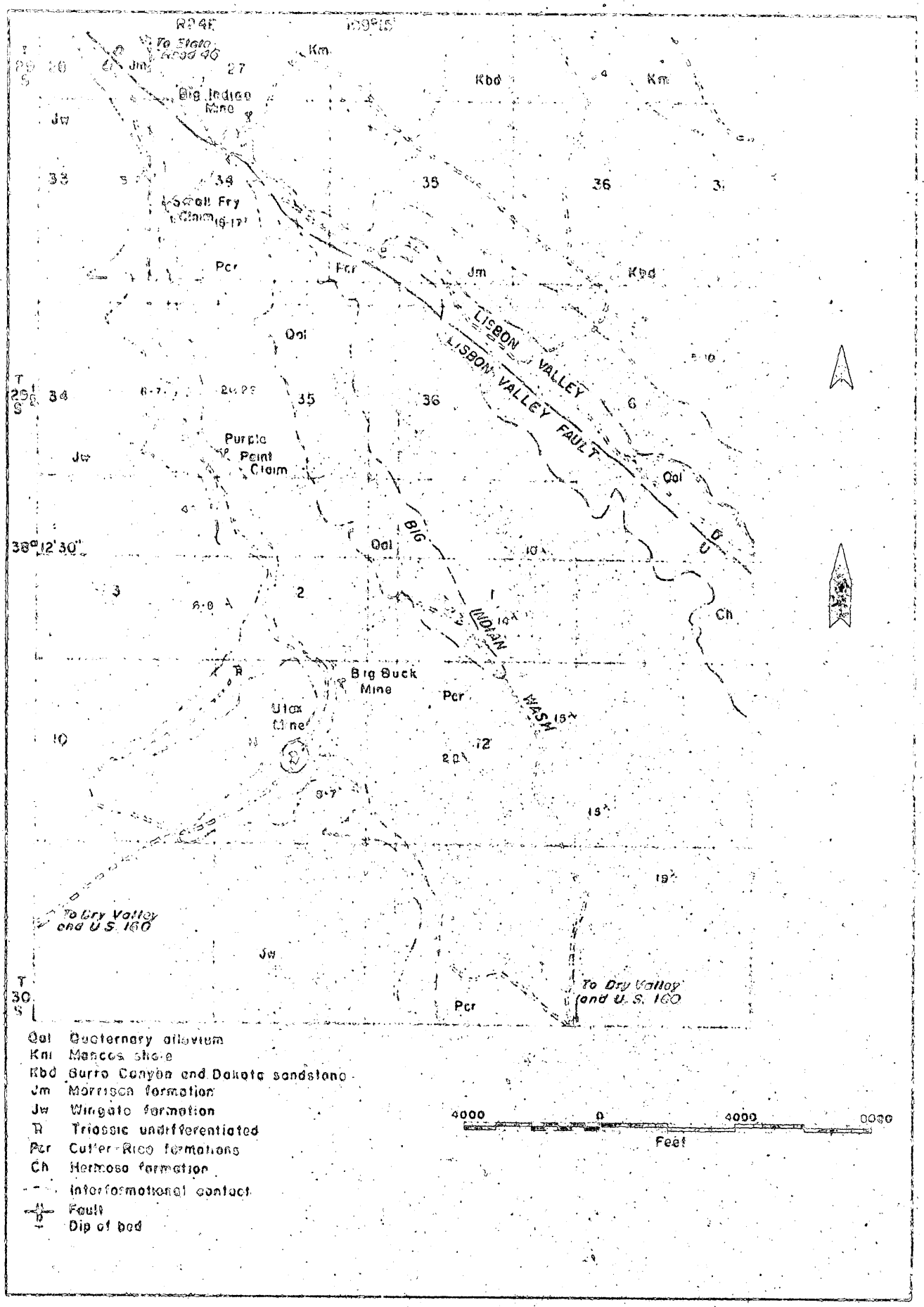


Figure 2 Geologic map of Big Indian Wash, San Juan County, Utah

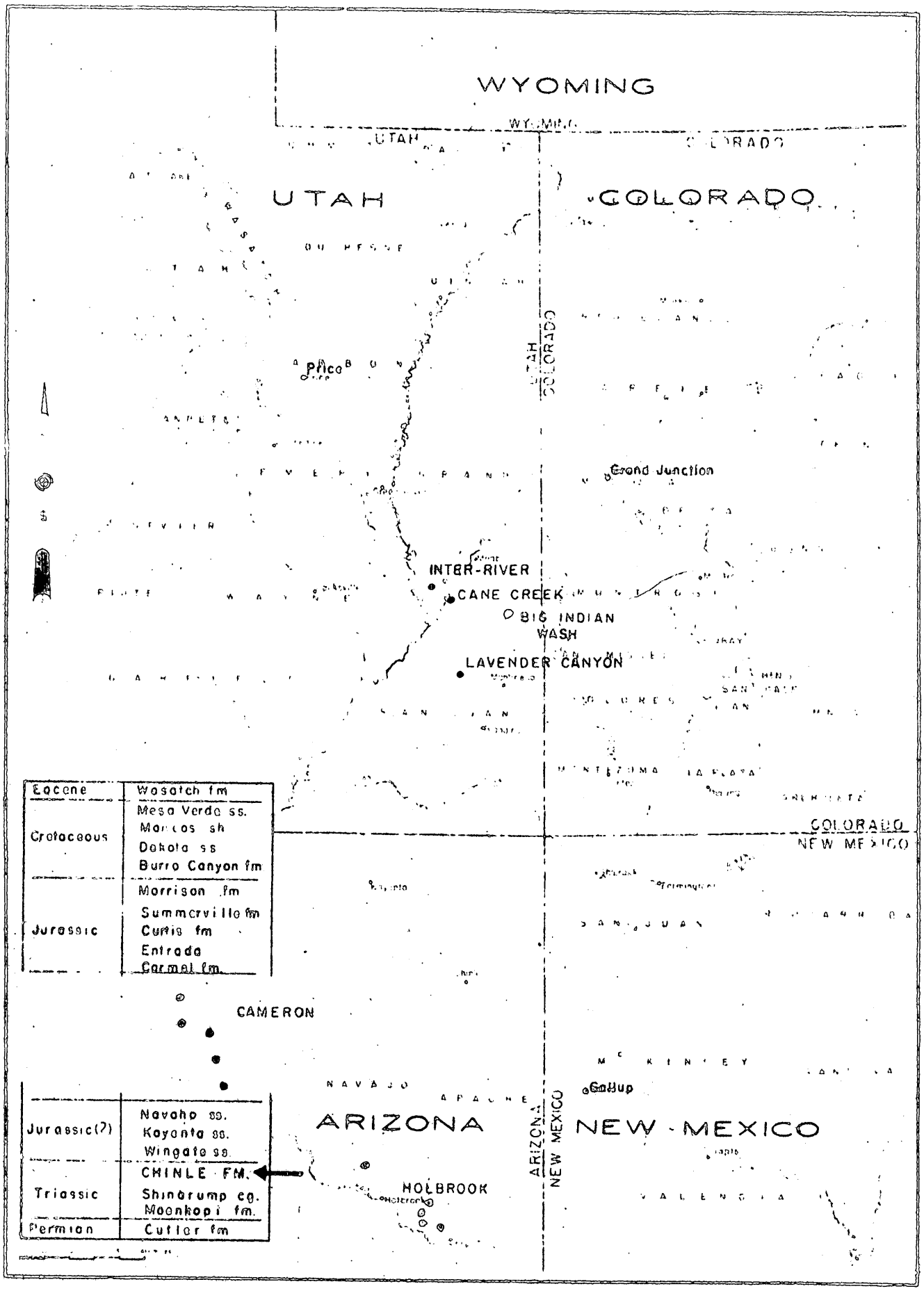


FIGURE - 1 Location Map, Lower Chinle Formation (Mossback) Deposits.

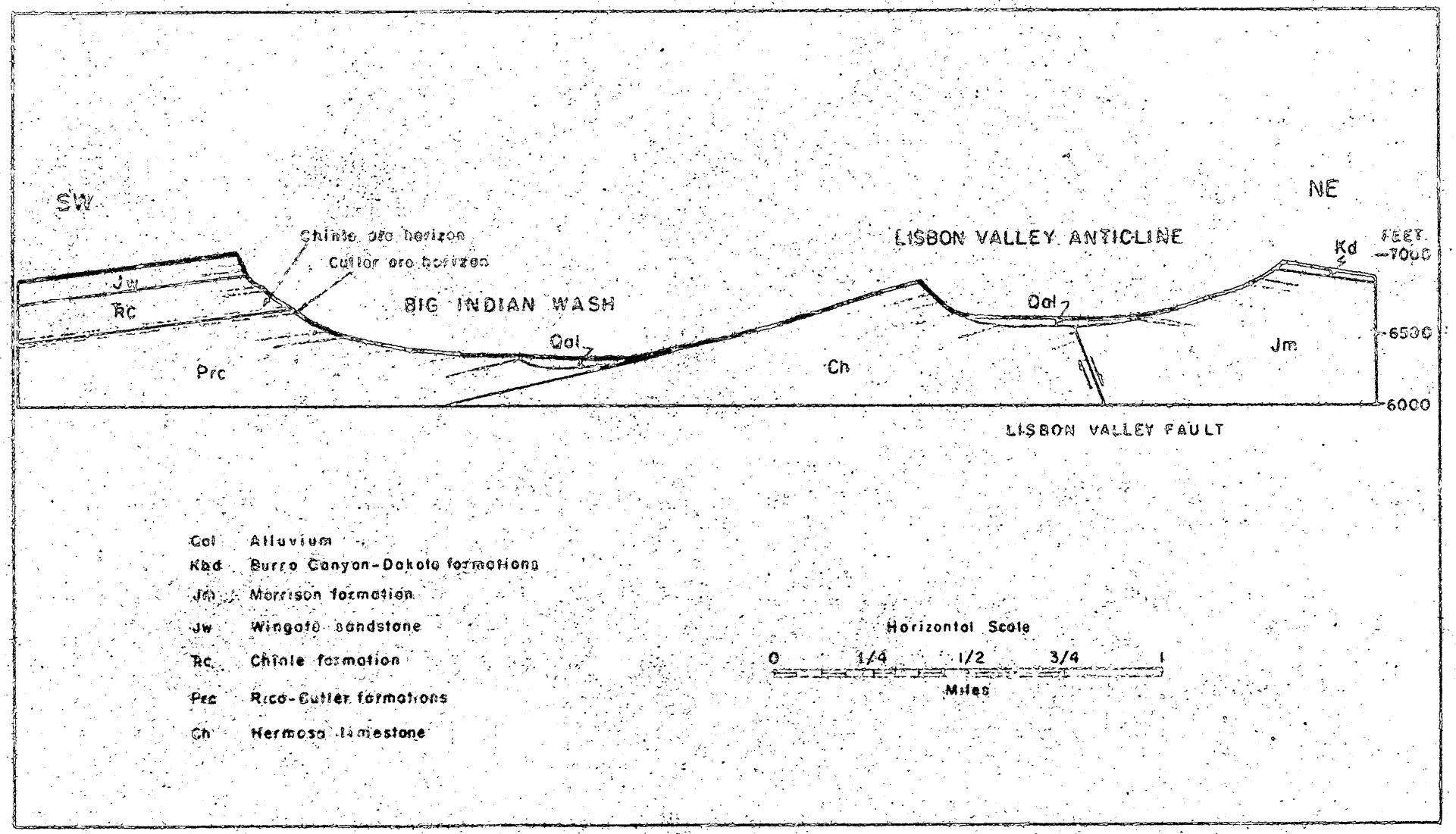


Figure 3 Geologic Section across Lisbon Valley Anticline in the vicinity of Utex and Big Buck Mines, San Juan County, Utah

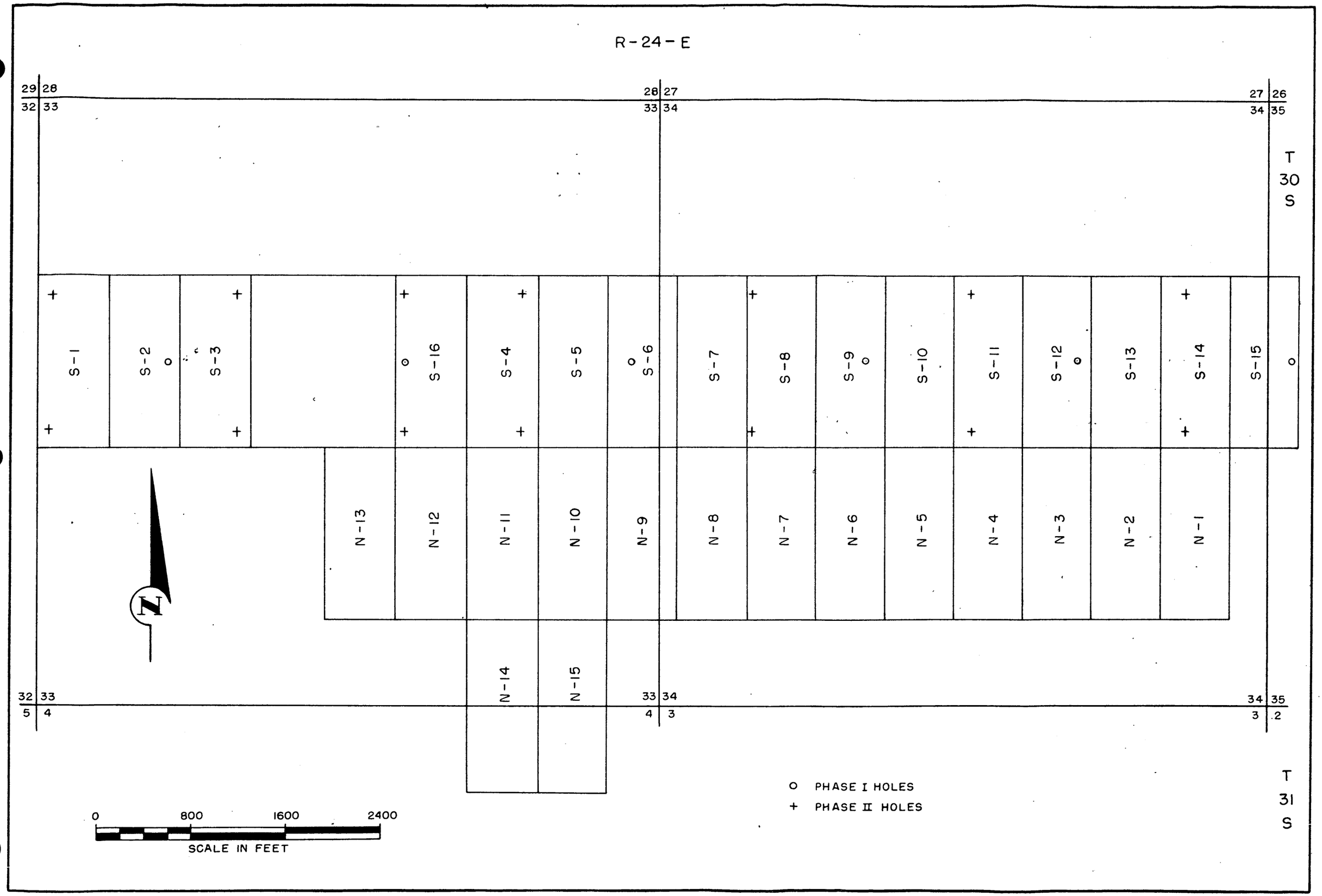


FIGURE 2 - CLAIM MAP, SHOWING PROPOSED EXPLORATION, SURITAL AND NAN CLAIMS, ALMAR MINERALS INC., SAN JUAN COUNTY, UTAH (DMEA 3420)

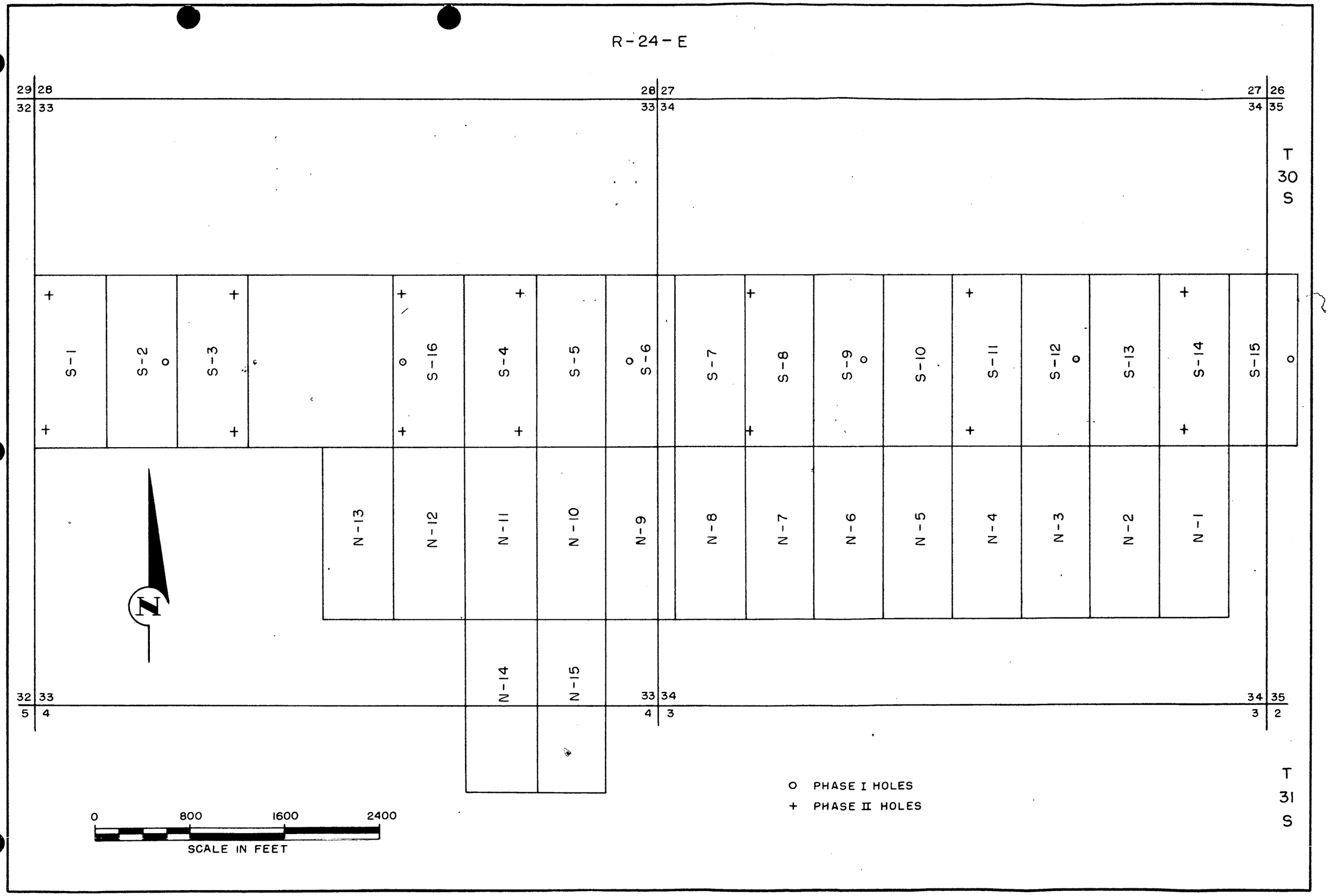


FIGURE 2 - CLAIM MAP, SHOWING PROPOSED EXPLORATION, SURITAL AND NAN CLAIMS, ALMAR MINERALS INC., SAN JUAN COUNTY, UTAH (DMEA 3420)

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3420

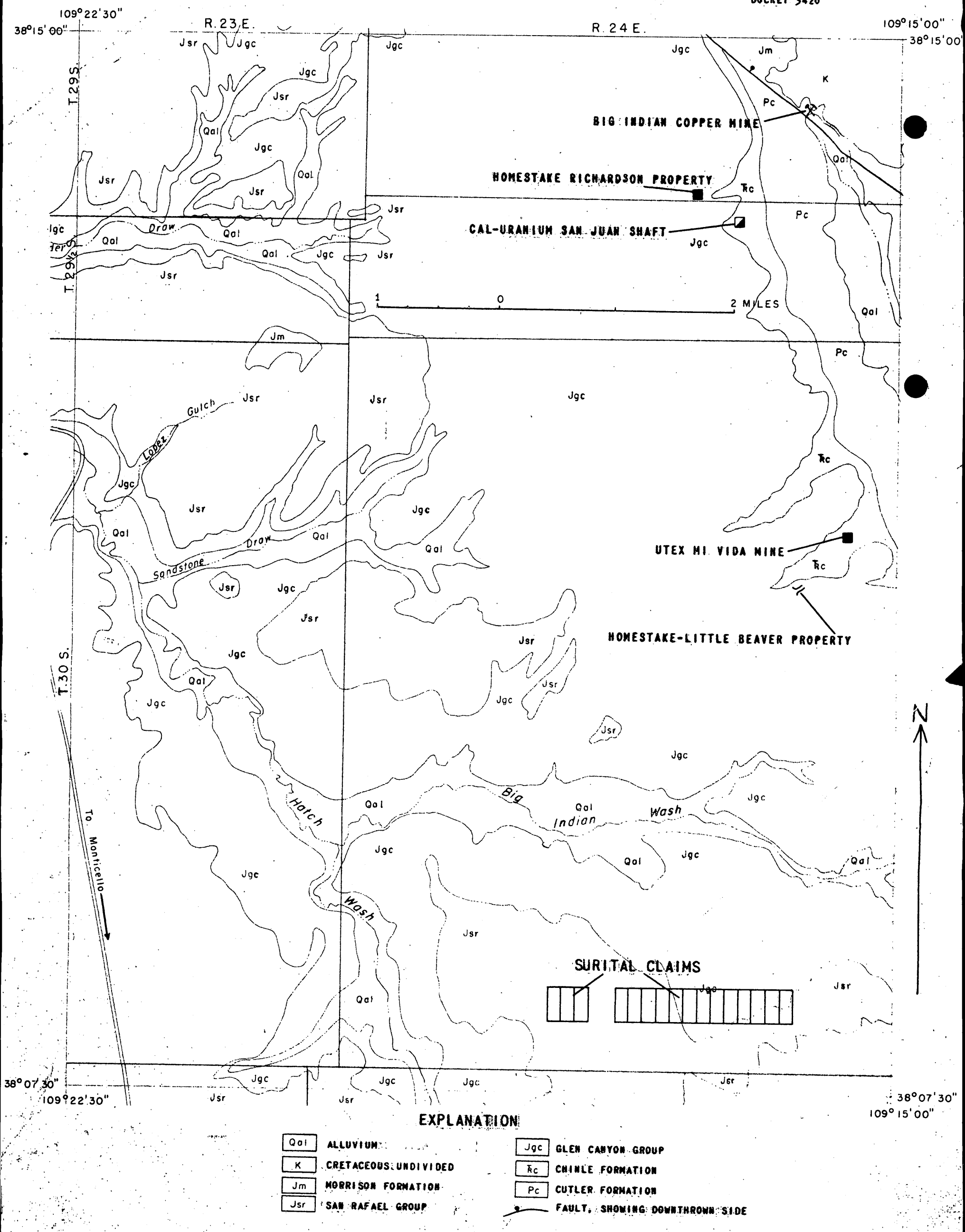


Figure 2. GEOLOGIC MAP OF PART OF BIG INDIAN WASH-LISBON VALLEY MINING DISTRICT SHOWING GEOLOGIC SETTING OF THE SURITAL CLAIMS, ALMAR MINERALS INC., SAN JUAN COUNTY UTAH

DMEA 3420

SURITAL CLAIMS
ALMAR MINERALS, INC.
SAN JUAN COUNTY, UTAH

Engineering Report

By Carl Palmer
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE

12-8-54
(date)

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3420

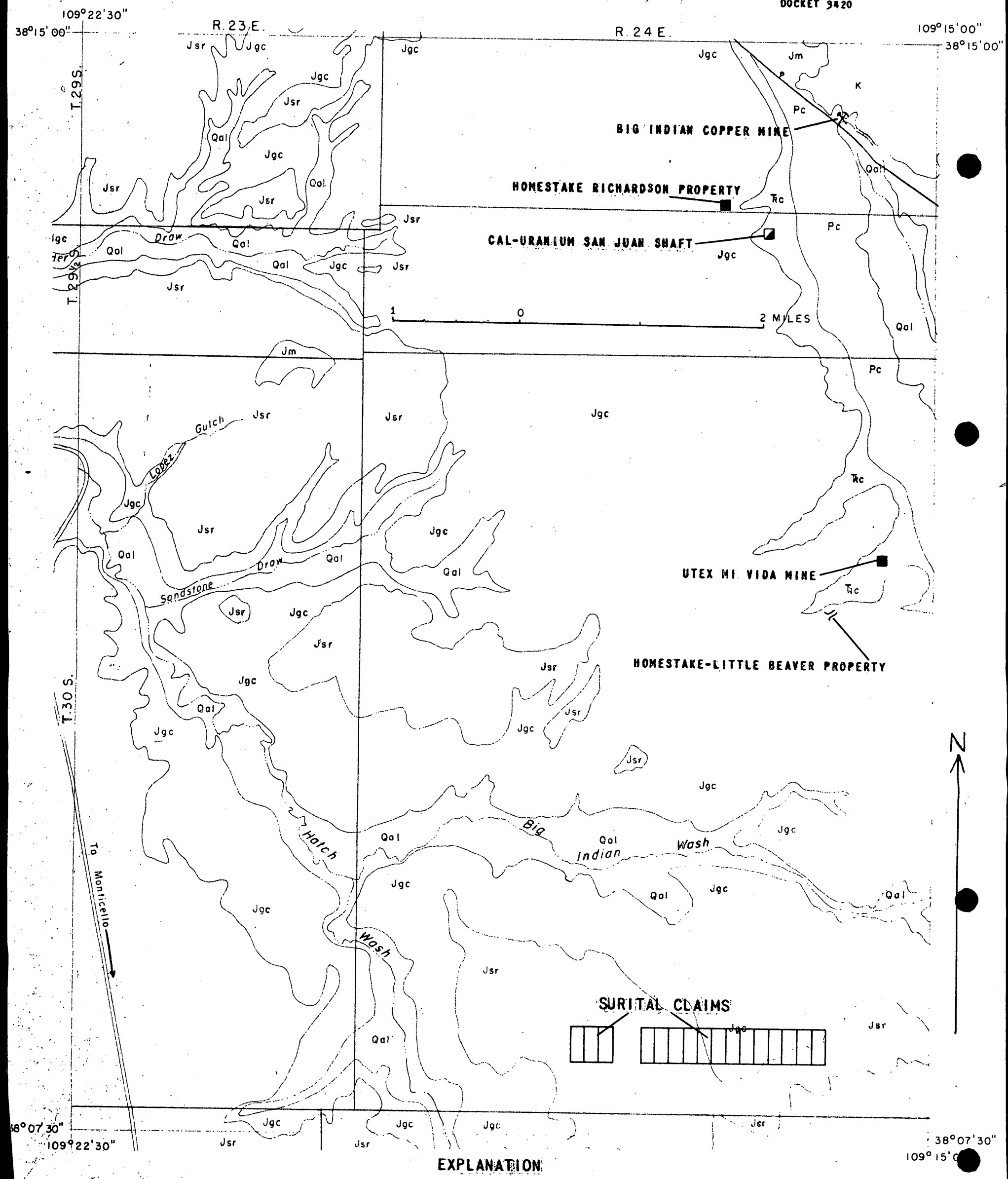


Figure 2. GEOLOGIC MAP OF PART OF BIG INDIAN WASH-LISBON VALLEY MINING DISTRICT SHOWING GEOLOGIC SETTING OF THE SURITAL CLAIMS, ALMAR MINERALS INC., SAN JUAN COUNTY UTAH

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
ATOMIC ENERGY COMMISSION

COMPILATION OF PHOTOGEOLOGY AND SURFACE GEOLOGY
COLORADO PLATEAU AREA, UNITED STATES

TRACE ELEMENTS MEMORANDUM REPORT 380 - A

EXPLANATION

QUATERNARY

Qal — Alluvium (Valley fill and terrace gravel)

CRETACEOUS

Km — Mancos shale

Kbd — Burro Canyon formation and Dakota sandstone, undifferentiated

JURASSIC

Upper and Lower: Jm, Jmb, Jms — Morrison formation. Brushy Basin shale member, Jmbb; Salt Wash sandstone member, Jms

Upper: Js — Summerville formation

Upper and Middle: Jem, Jel — Entrada sandstone. Moab tongue, Jem; lower unit, Jel

Jc — Carmel formation

Jn — Navajo sandstone

Jk — Kayenta formation

Jw — Wingate sandstone

TRIASSIC

Upper (?): R — Triassic rocks, undifferentiated

PERMIAN

Prc — Rico ? Cutler formations, undifferentiated

Contact (Can be accurately located within 30 feet horizontally)

Contact (Can be approximately located within 30 to 200 feet horizontally)

Contact (Cannot be located accurately; probable error greater than 200 feet)

Probable or doubtful contact

Fault (Dashed where approximately located. U, upthrown side; D, downthrown side)

Strike and dip of beds (Based on photo-interpretation)

Horizontal beds

Mine or quarry

Prospect or open cut

Primary road

Secondary road

Trail

Fence

BASE MAP COMPILED BY SOIL CONSERVATION SERVICE
U. S. DEPT. OF AGRICULTURE

MT. PEALE QUADRANGLE

TRUE NORTH

PHOTOGEOLOGIC MAP
MT. PEALE - 11
SAN JUAN COUNTY, UTAH

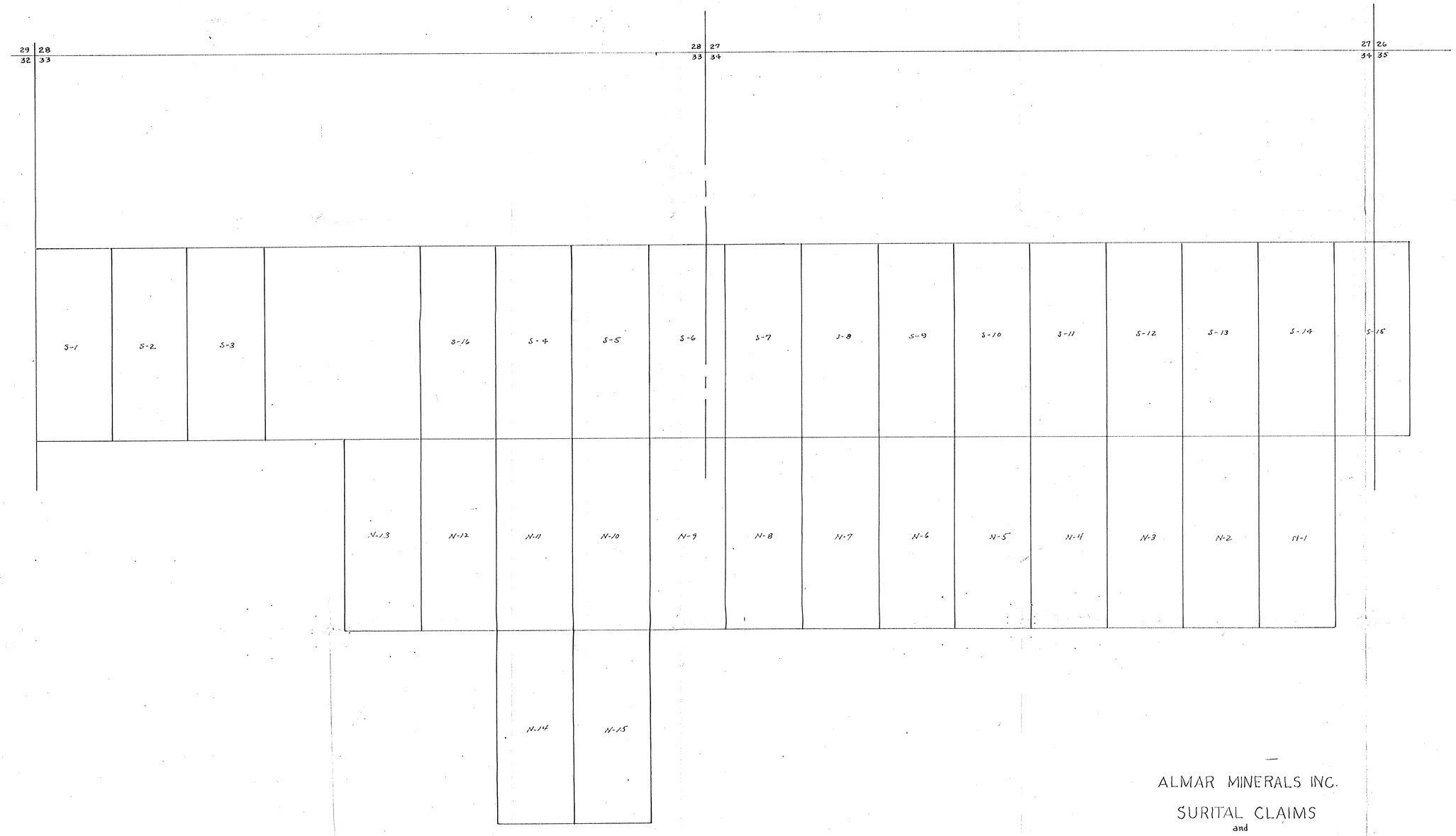
PHOTOGEOLOGY BY R. J. HACKMAN AND G. E. TOLBERT
SCALE 1:24,000
1 MILE

REVISED OCTOBER 1952

Stratigraphic column modified from U. S. Geol. Survey Bull. 841 and U. S. Geol. Survey Strategic Minerals Inv., Geologic map of vanadium region of southwestern Colorado and southeastern Utah, by R. P. Fischer, 1944.

11

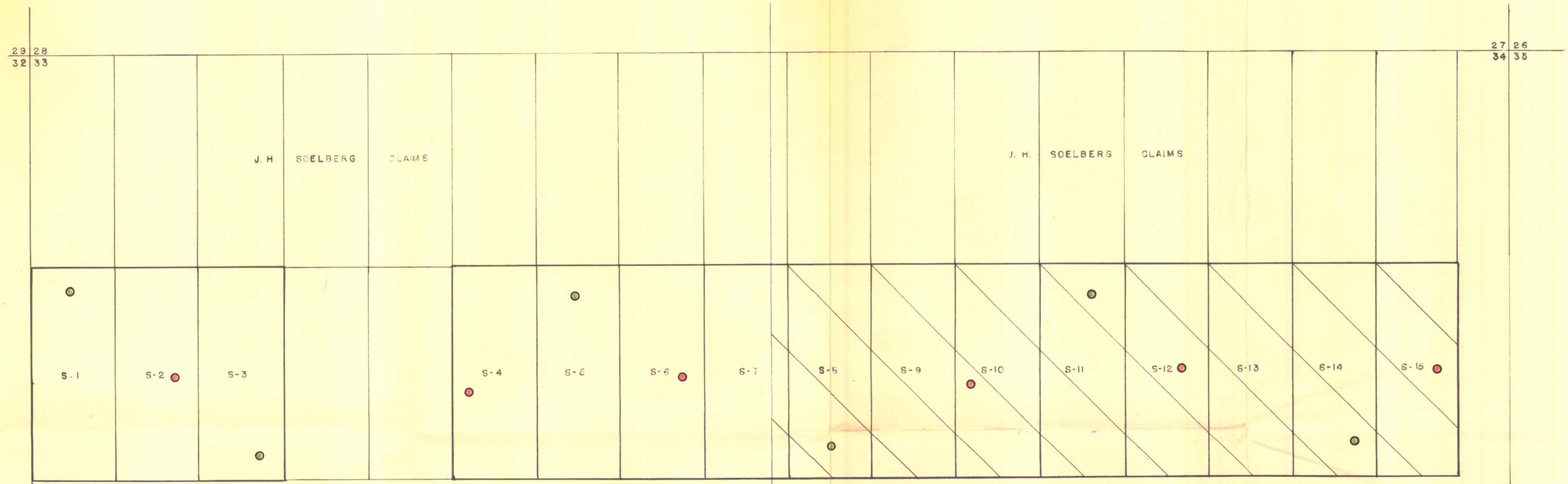
U 287 NE



ALMAR MINERALS INC.

SURITAL CLAIMS
and
NAN CLAIMS

BIG INDIAN WASH DISTRICT
SAN JUAN COUNTY,
UTAH
T. 30S., R. 24 E.
SCALE: 1" = 400'



ALMAR MINERALS INC.

SURITAL CLAIMS

NO.S 1-15

BIG INDIAN WASH DIST.

SAN JUAN COUNTY, UTAH

T 30 S, R 24 E

OIL & GAS LAND

SCALE 1"-500'

5 4 3 2 1 0 500

DRILLING STAGES

STAGE #1

STAGE #2