FILE COPY
SURNAME:

Selfridge
H. J. Johnson

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

SEP 2 9 1953

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

Re: Docket No. DMEA-2897 (Uranium)
Flat Top-Vilatie Hyde Claims
McKinley County, New Mexico

Dear Mr. King:

Please refer to your memorandum of September 21, 1953. The error you mentioned in the Minutes of the Operating Committee, No. 264, dated September 4, 1953, was corrected in Minutes No. 268, dated September 16th.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GHB)

Approved:

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

A. R. Kinkel, Jr.
Member, Geological Survey (GHB)

GCSelfridge/esf (9/28/53)
cc to: Docket
Admr. Reading File
Operating Committee
Rare & Misc. Metals Div.
Chron.

R.C.G. 9-29-53

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

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SEP 23 1953

224 New Customhouse
Denver 2, Colorado

September 21, 1953.

Memorandum

To: Chairman of the Operating Committee

From: Executive Officer, DMEA Field Team, Region IV

Subject: Field Report of Examination - DMEA Docket No. 2897 (Uranium), Flat Top-Vilatie Hyde Claims, McKinley County, New Mexico.

Reference is made to the Minutes of the Operating Committee No. 264 dated September 4, 1953, in which it is stated: "Field Report recommending approval. The contract was executed in Region IV and is in effect. The report was referred to the Commodity Group."

Our letter of August 27, 1953 stated: "The applicant has failed to furnish information necessary for the preparation of the contract and the application has been placed in the inactive file."

We have received no additional information from the applicant and the docket is still inactive.

W. H. King

W. H. King

FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

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

DATE: September 25, 1953

SEP 17 1953

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

SUBJECT: Field Team Report of Examination, DMEA Docket 2897 (uranium), Richard Vopat partnership, applicant, Flat Top-Vilatie Hyde claims, Nos. 1-3, S½ SE¼ Sec. 30, T. 13 N., R. 9 W., McKinley Co., N. Mex.

It is noted that the application discussed in the Field Team report concerning exploration at the property identified in the subject above has been placed in the inactive file of Region IV, because of the failure of the applicant to furnish information necessary for preparation of a contract. Should the application be restored to an active status I believe that the following comments should be brought to the attention of the Field Team. The report has been discussed with H. D. Keiser, Bureau of Mines member, Uranium Commodity Committee.

The examining members of the Field Team recommended rotary air drilling of 197 primary holes spaced 100 feet apart and 132 closer spaced offset holes to define ore discovered by the primary holes. The Field Team suggested that the number of primary holes be reduced to 47 by spacing holes 200 feet apart in a staggered pattern so that holes in alternate rows would be offset 100 feet with respect to holes in the adjoining rows. The report and the Field Team's suggestion were sent to the Geological Survey's Acting District Supervisor, Colorado Plateau district and referred by him to J. D. Strobell, Geologist, Geological Survey, for comment.

Strobell, as set forth in a memorandum accompanying the report, concurred in the smaller revised number of holes for the primary pattern and comments that the number of additional offset holes that might be required is difficult to estimate, but that judging from neighboring properties from 10 to 20 percent of the property might be expected to be sufficiently mineralized to warrant offset drilling.

In addition, Strobell presents an analysis of probable spacing and size of ore bodies that should be considered in arriving at the size of target to be sought. He also points out, as noted by R. P. Fischer in his covering memorandum of August 18 returning the report and Strobell's comments to the Field Team, certain mining problems that make it questionable whether or not the expected amount of ore could be mined and permit repayment of a DMEA loan.

The documents accompanying the report do not indicate what consideration was given to the points raised by Strobell. Although the property appears to be favorable for the discovery of ore bodies of average size for the district, I believe that if the docket is restored to an active status, consideration should be given by the Field Team as to whether or not average sized ore bodies could

be mined profitably under the conditions likely to prevail in mining. If they cannot, then I believe that an estimate should be made of the minimum sized ore body that could be mined successfully, and the plan of exploration modified to find ore bodies of that size and no smaller.

Arthur P. Butler, Jr

Copies to: E.W. Ellis (2)

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
SEP 4 - 1953

September 4, 1953

Memorandum

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

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

Subject: Final Report, DMEA Docket 2897, Flat Top - Vilatie Hyde claims, McKinley County, New Mexico.

I have reviewed the subject report by the Field Team, Region IV, and note that the application has been placed in the Region's inactive file owing to the applicant having failed to furnish necessary information for the preparation of a contract.

If and when the application is restored to the Region's active file, it is suggested that the Field Team be requested, in submitting its supplementary final report, to include in the report (a) copies of the application, (b) copies of the Field Team report recommending drilling in the amount of $4,531.80, which report is lacking in the subject report, and (c) an appraisal of the comments of R. P. Fischer, as presented in his memorandum of August 18, and of J. D. Strobell, Jr., as presented in his memorandum of the same date.

In connection with an appraisal of the comments of Fischer and Strobell, it is suggested that the Field Team be requested to express its opinion on Fischer's statement "Strobell points out, however, certain mining problems in the areas of these claims, and questions whether the expected amount of ore that might be found will be enough to repay the DMEA loan," and on Strobell's statement on the same subject which appears in the first two paragraphs on page 2 of his memorandum of August 18.

H D Keiser

H. D. Keiser

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

224 New Customhouse
Denver 2, Colorado

August 27, 1953.

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 200

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2897 (Uranium), Flat Top-Vilatie Hyde Claims, McKinley County, New Mexico.

Enclosed are four copies of the final report on the subject docket. The Field Team recommended drilling in the amount of $4,531.80 but the applicant failed to furnish necessary information for the preparation of a contract. The application has been placed in our inactive file.

Two copies of Form 3b are attached.

W. H. King
W. H. King

A. H. Koschmann
A. H. Koschmann

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
9-4-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

August 27, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2897 (Uranium), Flat Top-Vilatie Ryde Uranium Claims, McKinley County, New Mexico.

Enclosed are eleven copies of the final engineering report on the subject docket.

The applicant requested $19,000.00 to wagon drill 189 holes on a 100 foot grid pattern. The engineer examiner recommended the same amount of drilling.

The Field Team considered this amount of drilling to be excessive and asked R. P. Fischer for his comments and he concurred with the Field Team in recommending the drilling of forty-six primary holes.

The applicant has failed to furnish information necessary for the preparation of the contract and the application has been placed in the inactive file.

W. H. King
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
9-4-53
(date)

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P. O. Box 360
Grand Junction, Colorado

August 18, 1953

Memorandum

To: W. H. King
A. H. Koschmann R.N.K.

From: R. P. Fischer

Subject: Comments regarding DMEA 2897

The report on the field examination, DMEA 2897, Flat Top-Vilatie Hyde claims, McKinley County, New Mexico, and a modified recommendation by the field team was sent to this office for review. I referred the problem to J. D. Strobell, USGS geologist, who is familiar with the area. His comments are incorporated in a memorandum to me, four copies of which are attached.

Strobell believes the area of the applicant's claims to be favorable for finding uranium ore, and that the modified plan of exploration suggested by the field team is sound, provided arrangements are made to obtain radiometric logs of the wide-spaced drill holes. Strobell points out, however, certain mining problems in the area of these claims, and questions whether the expected amount of ore that might be found will be enough to repay the DMEA loan.

I believe Strobell's statement presents the problem clearly and gives enough information to permit the preparation of an exploration contract if the application is approved.

Returned herewith are the original copies of the Geological Survey and the Bureau of Mines final reports on the subject docket, together with a copy of the brochure. Also returned herewith are two copies of figure 2--one showing the drill holes recommended by the field examiners, and the other showing the modified pattern recommended by the field team.

RPF

R. P. Fischer
Acting District Supervisor
Colorado Plateau District

Enclosures

cc: King and Koschmann (3)

Reviewed by
DMEA OPERATING COMMITTEE
9-4-53
(date)

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

August 18, 1953

Memorandum

To: R. P. Fischer, Acting District Supervisor

From: J. D. Strobell, Jr., Geologist

Subject: Flat Top-Vilatie Hyde claims, McKinley County, New Mexico, DMEA 2897 (Uranium)

Application was made by Richard Vopat for federal assistance in exploring the three Flat Top-Vilatie Hyde claims in sec. 30, T. 13 N., R. 9 W., McKinley County, New Mexico. The applicant proposed to spend $19,000. The property has been examined by the Bureau of Mines and Geological Survey. Their reports and a suggestion by the Field Team have been referred to the Colorado Plateau District office for comment.

I have ~~received~~ reviewed the applicant's proposal and the examiners' recommendations, and have myself been on the property (June 2, 1953, and August 11, 1953) in connection with examination of the adjacent F. O. Manol property. Through Mr. P. E. Melancon, District Geologist of the U. S. Atomic Energy Commission at Grants, New Mexico, much pertinent information about exploration and development in the vicinity of the Flat Top-Vilatie Hyde claims was made available.

The applicant proposed to drill the property on 100-foot centers and to offset favorable holes at distances of 10 to 25 feet. The examiners allowed 197 primary holes spaced 100 feet apart and 132 closer spaced offset holes. The Field Team suggests that the primary holes be spaced 200 feet apart in a staggered pattern having alternate rows offset 100 feet; this suggestion would require only 46 primary holes.

I concur with the last suggestion but would add four holes near the east edge of the property (see figure 2) and would include one important proviso, namely that the wider spacing of the primary holes be used in conjunction with radiometric logging of these holes.

The geologic report by Robinson gives a complete and accurate summary of available information. As pointed out by him, exploration to the south of the Flat Top-Vilatie Hyde claims by the Santa Fe Railraod and to the west by F. O. Manol and the Santa Fe suggests that these claims lie in a vaguely defined belt of mineralized ground. This exploration in secs. 25, 30, and 31 found about 25 ore bodies in a total drilling area of nearly 1 square mile. These ore bodies are estimated to contain about 80,000 tons of ore averaging about 0.20 to 0.25 percent U_3O_8. The average ore-body thus contains about 3,000 tons of ore. Assuming this same frequency of ore occurrence

(25 ore bodies per square mile), one or two such bodies would expectably be found on the Flat Top-Vilatie Hyde claims which have a total area of slightly more than 1/16 of a square mile. There thus appears to be a favorable chance of finding 3,000 to 6,000 tons of ore on these claims.

Ore of this grade (0.20-0.25% U_3O_8) would be worth from $14.00 to $18.25 per ton (base price plus premium). Repayment of the loan at 5% would thus return to the Government between $0.70 and $0.9125 per ton. If the operator would agree to subject his bonus to the lien he would repay an additional $0.70 to $0.8750 per ton on the first 2,000 to 2,500 tons only. Hence it appears that if 6,000 tons of ore of this grade are discovered, repayment of between $4,200 and $7,225 can be expected. Perhaps, therefore, the costs of the proposed federally aided exploration should be reduced below the amount applied for. One method of accomplishing this which might be successful would be wider spacing of the primary drill holes.

According to the examiners' reports, the ore-bearing limestone on the Flat Top-Vilatie Hyde claims is buried beneath 6 to 75 feet of "soil cover", and the average depth of holes is estimated to be 70 feet. As the limestone is itself on the order of 20 feet thick, the average depth of cover would appear to be about 50 feet. The "cover" in most parts of these claims consists of windblown sand and alluvium which would have to be stripped in mining as neither the sand nor the limestone would support a roof for underground work. The average thickness of the cover is considerably larger than that being stripped elsewhere in the district. Costs of stripping might be so significantly higher than other current operations in the district as to require larger or richer ore bodies in order to justify mining. This consideration also seems to me to recommend the wider spacing of the primary drill holes.

The ore bodies already found in the vicinity of the Flat Top-Vilatie Hyde claims range in area from about 25 x 25 feet to 800 x 100 feet. Most of them are elongated, the length being several times the width. According to Mr. Melancon, they are surrounded by a zone in which the radioactivity is measurably higher than the radiation background of limestone, and such zones of increased radioactivity may extend as much as 100 feet beyond the limits of ore.

In order to find the expected amount of ore, primary drilling on 100-foot centers would be necessary in order to intersect the small, elongated ore bodies. If, however, advantage be taken of the radioactive "halo", I believe primary drilling could be done on 200-foot centers. Radiometric logging of the drill holes would give this advantage. Without radiometric logging, negative results on a 200-foot spacing would not disprove the area drilled, because an ore body up to 200 feet in diameter and containing as much as 10,000 tons could be completely missed. With radiometric logging, the radioactive halo around such an ore body would expectably be intersected by at least one hole.

Radiometric logging to determine this relatively "favorable" ground has been done by the Atomic Energy Commission with scintillometer equipment and by some operators with simple geiger counters having long cords on the probes. In-hole logging may also soon be available commercially in the district through Manol and Rappaport.

Use of in-hole radiometric logging would permit the primary holes to be drilled without sampling and provide another saving. But all offset holes should be sampled through the entire thickness of the limestone, because radiometric logging has not as yet been demonstrated to yield reliable determinations of grade. Radiometric logging or scanning of the samples can, however, be used to select the samples of potential ore-grade for assaying.

Because of the small size of the deposits, I would add the four primary holes circled in ink on figure 2, to the scheme suggested by the Field Team. Too large an area is left untested by omitting these holes.

The amount of offset drilling that will be needed to complete the project is difficult to estimate. Judging again from the distribution of the known deposits, 10 to 20 percent of the area might merit further testing by closer spaced drilling, and up to 2 or 3 percent of the area might be underlain by ore-grade material.

It should be pointed out that the ore occurs throughout the limestone at all positions between top and bottom. In order to insure drilling through the entire thickness, all holes should penetrate at least 2 feet into the underlying sandstone. If in-hole logging is contemplated, the hole should be drilled 5 feet below the base of the limestone, especially in the deeper holes. This insures being able to log the entire thickness of the limestone even though the hole is partly filled by sloughing. I am not sure that this factor was considered by the examiners in arriving at their estimated average depth of hole.

J. D. Strobell, Jr.
Geologist

JDS/je

cc: King and Koschmann (4)
Reading file

MINING DIVISION
REGION IV

June 18, 1953

Memorandum

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMEA-2897, Flat Top-Vilatie Lyde Uranium Claims, McKinley County, N. Mex.

Enclosed are original and 10 copies of the section on Summary, Conclusions and Recommendations by M. J. Elsing of the Bureau of Mines and R. F. Robinson of the Geological Survey, and the section on Engineering by Elsing. A separate section on geology will be submitted by the Geological Survey.

As a substantial amount of uranium ore may be discovered by this exploratory project, the examiners recommend that a loan for $19,141 be granted the applicant. I concur with their recommendations.

Brochure is enclosed as are 9 copies of Figure 2 for a possible contract.

Walter R. Storms

Walter R. Storms

CC W. H. King (10)
R. F. Robinson
DMEA-2897
DF

WRStorms:frj

Reviewed by
DMEA OPERATING COMMITTEE
9-45-3
(date)

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

200 New Customhouse
Denver 2, Colorado

June 9, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2897, Flat Top-Villatie Hyde Claims (Uranium), McKinley County, New Mexico.

Enclosed are the original and 10 copies of the geologic report by Raymond F. Robinson of the U. S. Geological Survey covering the above docket.

It has been recommended that the loan be approved.

The brochure is enclosed.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (12)

Reviewed by
DMEA OPERATING COMMITTEE
9-4-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O.Box 4126, University Station
Tucson 5, Arizona

June 4, 1953

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: Raymond F. Robinson, Tucson, Arizona

Subject: Geologic Report, DMEA 2697, Flat Top-Vilatis Hyde Claims (Uranium), McKinley County, New Mexico

Accompanying this letter are the original and 10 copies of the geologic report on the subject docket. A separate engineering report has been submitted, although the U. S. Bureau of Mines did not participate in the examination.

The writer is of the opinion that the results of exploration and mining in the vicinity of the Vopat, et al property indicates a trend in the distribution of economic quantities of uranium mineralization. The Vopat, et al property lies well within the southeasterly extension of this favorable zone and it appears that there is a reasonably good chance to discover new ore bodies on it.

It is recommended that a DMEA loan totalling $19,736 for complete drilling of the property be granted. The Government's share of this program will be $17,762.

The field team should consider the possibility of substituting the scintillometer logging device of the Atomic Energy Commission for sampling and assaying in the proposed program. If this can be done, several thousand dollars allotted for the eliminated items can be saved.

The brochure is enclosed.

Raymond F. Robinson
Raymond F. Robinson
Acting District Supervisor
Arizona-New Mexico

Enclosures 11

Reviewed by
DMEA OPERATING COMMITTEE
9-4-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2897, Flat Top-Vilatie Hyde Uranium Claims

McKinley County, New Mexico

M. J. Elsing, Consulting Mining Engineer
U. S. Bureau of Mines

R. F. Robinson, Geologist
U. S. Geological Survey

June 1953

Reviewed by
DMEA OPERATING COMMITTEE
9-4-53
(date)

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

M. J. Elsing[1] and R. F. Robinson[2]

On February 17, 1953, the Field Team of Region IV, Defense Minerals Exploration Administration, requested that an examination and report be made on the feasibility of Government assistance in the amount of $19,141 for the exploration of uranium on the Flat Top-Vilatie Hyde claims, McKinley County, N. Mex. The application was made by Richard Vopat (a partnership). The project has been given Docket No. DMEA-2897 (Uranium).

On May 4 - 6, 1953, R. F. Robinson went to Grants, N. Mex., met Vopat and with him examined the property. Robinson also interviewed various Atomic Energy Commission officials, including the district geologist. M. J. Elsing and J. F. Haynes of the Bureau of Mines, accompanied by Paul E. Melancon of the Atomic Energy Commission at Grants, visited the property on June 2, 1953.

The property is situated 14.3 miles northwest of Grants in McKinley County, N. Mex. and is entirely covered by sandy soil. No outcrops are present. Therefore, it must be evaluated entirely on the basis of information from adjoining areas.

The property consists of 3 unpatented claims comprising approximately 46 acres. These claims cover a nearly rectangular area, 1,550 feet in an east-west direction and 1,300 feet in a north-south direction. The Oscar Manel property lies immediately to the west,

---

1/ Consulting Mining Engineer, U. S. Bureau of Mines
2/ Geologist, U. S. Geological Survey

and property of the Santa Fe Railway is immeidately to the south. Both of these properties are producing high-grade uranium ore from small ore bodies.

Based on the past history of the operation of these properties, the following conclusions have been drawn:

(1) The property lies within the projected boundaries of what appears to be a favorable zone for uranium mineralization which has been defined by drilling and mining for uranium to the west and south of the property.

(2) The ore bodies which may be found will probably be small, the production of which will range from a few hundred to a few thousand tons of ore. The grade probably will average 0.25 percent U_3O_8 as this is the average of 3,000 tons of ore which has been produced to date on an adjacent property.

(3) The ore will be contained in the Jurassic Todilto limestone. The ore bodies probably will occur from a few feet to 100 feet below the surface. The Todilto limestone on this property varies from 8 to 20 feet in thickness, depending upon the amount of erosion, and the ore may be found at any horizon within it.

(4) The occurrence of the ore is governed by small geologic structures which are not persistent laterally or vertically for large distances and have no predictable trend.

(5) Because of the small size of the ore body and unpredictable extent of the structural controls, it is standard practice to drill areas on a 100-foot center grid pattern. Having discovered ore in one hole it is necessary to delineate the ore body with additional closer spaced holes.

Exploration will consist of drilling 4-inch dry holes with a rotary rig. The W. T. Myers Drilling Co. has agreed to drill holes up to 100 feet in depth for $0.50 per foot. When the ore bearing limestone is encountered, holes will be blown at 2-foot intervals and a sample will be recovered. The cost of drilling this type of hole will be $1.00 per foot for holes up to 100 feet in depth.

The proposed project calls for a total expenditure of $19,141 for drilling 23,030 feet of hole, and all other expenses including supervision, assaying, engineering, bookkeeping, and capital expenditures.

The district geologist of the Atomic Energy Commission is familiar with the area. In a letter, dated May 26, 1953, he stated that the property is definitely worth considering for a loan. He further stated that the proposed drilling pattern is normal for exploration in the limestone, and it has been used extensively and fairly successfully by both Anaconda and the Santa Fe Railway.

The cost of this project, considering the amount of work to be done, is exceptionally low. Myers has submitted a very low cost for drilling. The Atomic Energy Commission officials have advised that he is a good driller and has had much experience in the district. It is only for this reason that it has been assumed that he can drill at rates at which he has bid.

It is proposed that if the project is approved that it be set up on the basis of a short form contract. The total price per foot of hole should be 83 cents, of which drilling amounts to 64 cents per foot, and supervision, assaying, and all other expenses amount to 19 cents per foot. The applicant should pay all costs in excess of this amount.

Provision has been made for drilling 197 primary holes 70 feet deep and 132 fill-in holes which will also average 70 feet deep. It is anticipated that these 329 holes will cut 20 feet each of the ore-bearing limestone. Provision has been made for sampling each 2 feet of the limestone. This means 10 samples per hole, or a total of 3,290 samples. Each of these samples should be tested with a Geiger counter. Allowance has been made for assaying 200 samples by chemical methods. The cost of this has been set at $7.50 per sample to allow for assaying, transportation, express, and check sampling by Ledoux & Co., or some very reliable umpire.

It must be the duty of the examining team to make certain that all limestone is sampled and that an adequate number of samples are assayed. The whole purpose of the project is to get assays in order to determine the tonnage and the grade of the ore.

If the applicant did not take all of the samples provided for he could easily save more than his cost of the project. With 20 feet of limestone in each of 329 holes there will be a total of 6,580 feet of limestone. The ordinary drilling of this footage would be at 50 cents per foot, or $3,290. If samples of this footage are recovered the cost will be $1.00 per foot. A total of $1,500 has been allowed for assaying. Since the applicant is being allowed these sums the examining team should use more than ordinary care to make sure that adequate sampling and assaying are done.

Because of the need for uranium for the defense effort and because it is believed that there is a reasonable chance that this project will result in the discovery of uranium ore in economic amounts, it is recommended that an exploration project on the Flat Top-Vilatie Hyde claims be approved on the basis of an expenditure of $19,141.

FLAT TOP-VILATEK HYDE CLAIMS
(RICHARD VOPAT, ET. AL.)
MCKINLEY COUNTY, NEW MEXICO
DMEA 2697

URANIUM

Geology

By
Raymond F. Robinson
Geologist, U. S. Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE
9-4-53
(date)

FLAT TOP-VILATIE HYDE CLAIMS
(RICHARD VOPAT, ET. AL.)
MCKINLEY COUNTY, NEW MEXICO
DMRA 2897

URANIUM

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INTRODUCTION

The writer visited the Grants, New Mexico area May 5 and 6, 1953, in order to examine the property of Richard Vogat, et. al., designated as the Flat Top-Vilatie Ryde Claims Nos. 1, 2, and 3, for which an application for a DMEA exploration loan has been made. May 5 was spent obtaining information and discussing exploration problems with Mr. Paul Melancon, Chief of the Atomic Energy Office at Grants, New Mexico. Mr. Melancon gave whole-hearted and friendly cooperation and provided pertinent data in the form of maps, drill hole data, and general information on the area. May 6 was spent examining the Vogat property and also several adjoining properties on which mining is being conducted.

Since the Vogat property is completely soil covered, most of the evaluation of the property as a potential uranium-bearing area must be made on the basis of information gained from surrounding operations. The information in this report was obtained largely from Mr. Melancon, publications of the U. S. Geological Survey and the Atomic Energy Commission, from personal observations, and from discussions with Mr. Oscar Manal, Mr. Irving Rapaport, and Mr. William Geffey. The latter are operators of producing mines adjoining the Vogat property.

The Bureau of Mines did not participate in the examination of this property, but an engineering report has been prepared by Mr. M. J. Kising from information provided by the writer, the dealer, and other engineers.

GENERAL DESCRIPTION

The Vogat, et. al. property is located in the south half of the SE quarter of Section 30, T. 13 N., R. 9 W., McKinley County, New Mexico.

It lies 11 miles north of the San Mateo-Highway 66 junction which is 3 miles west of the AEC office in Grants, New Mexico.

The whole area is readily accessible in dry weather by means of jeep or truck. The conditions of most of the branch roads are subject to weather conditions and are poor to impassable during wet weather. The San Mateo road is a fairly good truck road from the Vopat property to U. S. Highway 66, a paved road. The Anaconda buying station is located about five miles west of the intersection along Highway 66 at Bluewater. The main line of the Atchesen-Topeka and Santa Fe railroad parallels Highway 66.

The general area is drained by the San Jose River, a tributary of the Rio Grande, and there are no perennial streams in the area. The water for farming, the principal industry of the area, is obtained largely from wells. The rainfall averages about 14 inches and the country is semi-arid. The days are warm and nights cool. In winter freezing temperatures are reached but the days are pleasant in the river valley.

The vegetation is sparse and consists of sage, grasses, and flowers, juniper, pinon pine, varieties of cacti, greasewood, and some cottonwood. On the high slopes of Mt. Taylor to the east yellow pine, fir, spruce, and aspen are found.

Topographically, the immediate area is predominantly of low relief and lies between 6500 and 7000 feet elevation. Several miles to the east, Mt. Taylor arises about 5000 feet above the river valley, or 11,300 feet above sea level. The San Jose occupies a broad valley incised in soft Triassic shales of the Chinle formation. The south side of the valley abuts against recent volcanic flows. On the north lie a series of low, south-facing

bluffs and mesas. The escarpments are formed by resistant sandstone members and the flat mesas above by soft shales of several formations. The mesas dip gently north and are soil-covered to varying degrees.[1]

The Vogat property is located on one of the flat mesas about a half mile north of the first escarpment to the north of the San Jose River. It is completely soil-covered from depths ranging from 6 to perhaps 75 feet. There are no rock outcrops present on the property. The local relief is very slight, the altitudes ranging from 6,835 on the southwest to 6,800 on the northeast side (see fig. 2).

Ownership

The ownership is mentioned in the engineering report. The claims, Flat Top-Vilatie Hyde Nos. 1, 2, and 3, consist of 2 and 2/3 claims, an area embracing approximately 45 square acres (see fig. 2). The claims were originally owned by Mrs. Vilatie Hyde. Mr. Frank Manel, acting as agent, negotiated the sale of the claims to the Vogat (et. al.) partnership. Mrs. Hyde retained a 5% royalty interest by common agreement and Mr. Manel retained a 10% royalty interest for his part in the transactions. Due to a dispute over actual ownership of the claims early in the transactions, a quiet title suit was necessitated. Mr. Vogat has been asked to submit all pertinent information on this matter. The land here has been withdrawn by the Atomic Energy Commission but the Vogat claims are not affected by this because they existed as valid claims prior to the withdrawal. No gas or oil leases have been taken on this property, according to Mr. Vogat and the Bureau of Land Management. Local ranchers retain grazing rights on all of the area.

1/ Hunt, Chas. B., The Mt. Taylor Core Field, Pt. 2 of Geology and Fuel Resources of the Southern Part of the San Juan Basin, New Mexico: U.S.G.S. Bull. 860B, 1934-36.

Past Work on Property

There has been no production from mining on the Vopat property. Some bulldozing was done last year for assessment work but the trenches are sloughed in and nothing of value to an examination can be seen. Bed rock was reached in some to the southwest at a depth of about 6 to 8 feet. Last year 31 wagon holes were drilled as shown on figure 2 of this report and a map accompanying the engineering section. These holes showed little or no values when probed by the AEC using the regular geiger counter. The AEC office feels, however, that this drilling was not entirely satisfactory and that the proposed exploration work should include some drill holes to check. The wagon drill holes did not have sufficient diameter to permit the use of the scintillometer device now in use in the area.

The writer checked the holes on the Vopat property with a geiger counter against the nearby holes on the Manol property on the west side of Vopat's claims. It was noted that the recordings were at least three times higher at collars of the wagon hole drills on the Vopat claims than those on Manol ground.

GEOLOGY

Stratigraphy

The stratigraphic column for the area about the property is given below. It is taken from RMO 642[2/].

2/ Rapaport, Irving, Hadfield, J. P., Olson, Richard H., Jurassic Rocks of the Zuni Uplift, New Mexico: U. S. Atomic Energy Commission, RMO 642, March, 1952.

Age	Group	Formation	Type	Thickness
Upper Jurassic	Morrison	Brushy Basin*	Ms Ss	0-130
		Westwater Creek	Ss	30-290
		Recapture Creek	Ss Sts Sh	0-140
	San Rafael	Bluff	Ss	220-630
		Summerville	Ss Sts Sh Ls	0-190
		Todilto**	Ls	0- 30
		Entrada	Ss	130-890
		Carmel	Sts Ss	55-860
Tower and/or Middle Jurassic	Glen Canyon	Wingate	Ss Sts	0-120
Triassic	Chinle		Ms Sh Ss Ls	850±

* Shattuck Denn operation in this horizon.
** Principal producing uranium horizon.

On the Vogat and adjoining properties, the Todilto limestone is the principal uranium-bearing horizon. The local thickness is 12-20 feet. Erosion has removed most of the overlying Summerville on the property except possibly on the northeast corner (where some of it may be left). Figure 2 shows, by means of structural contours along the base of the Todilto, that in this corner the base of the Todilto is over a hundred feet deep. According to drill hole data, as much as 8 feet of the Todilto may have been removed by erosion on the southwest corner of the property. Since the formational dip is to the northeast, full thickness of the formation may be expected over much of the property. This cannot be ascertained at present because, as mentioned previously, the claims are completely soil-covered to a depth of 6 to 75 feet.

The Todilto formation may be conveniently subdivided into lower and upper sections on a lithologic basis. The upper portion is a dark-grey, dense, thinly-bedded limestone. The beds are well marked and show considerable crinkling and crenulation. It has undergone recrystallization. The lower portion is dark grey, dense, thick-bedded, lithographic textured limestone and near the base it contains interfingering lenses or beds of

calcareous silty sandstone. The formation as a whole is unfossiliferous and is said to have a petroliferous odor on fresh fractures.

According to RMO 6[illegible]3/ the Entrada sandstone underlays the Todilto limestone conformably. The Entrada is said to be largely eolian in origin and the Todilto formed in a lacustrine basin. The Summerville overlies the Todilto conformably and in turn is overlain in the same way by the Bluff. The latter two formations are though to be fresh-water stream deposits on flat-lying plains.

The Summerville and Bluff have been completely removed by erosion from the Vogat property.

The Morrison group overlays the lower formations conformably. It is considered to be fresh-water deposits on flat-lying flood planes by streams which deposited chiefly during flood times. They contain much organic matter in the form of vegetation and dinosaur remains. In the Grants area the Brushy Basin and West-water members contain carnotite-like deposits associated with organic remains. (Shootnick Bean operation is in Brushy Basin). These have been removed by erosion from the Vogat property.

Structure

The uranium producing area near Grants lies on the north flank of the Zuni Uplift, believed to be of early Tertiary age. The McCarty syncline lies north and east of the area. It appears that this uplift has been particularly instrumental in the structural deformation of the Grants area and produced conditions which led to the localization of uranium ore bodies.

The Zuni Uplift is a broad asymmetrical dome about 65 miles long, elongated in a northwest direction, and about forty miles wide. The southwest portion has strata dipping south up to 80 degrees, while on the north flank, the strata are gently dipping northward. Structural relief is estimated to

3/ Op. cit.

be 6,600 feet and a Pre-Cambrian crystalline core is exposed on the highest parts of the dome.

The McCarty syncline has been structurally depressed about 1500 feet below the mass of Mt. Taylor volcanics. Dikes which cut through the Grants uranium-bearing area are thought to be related in origin with this mass.

Folding

Several broad folds on the north flank of the uplift are believed to have formed with it. The Vopat and adjoining properties lie on the northwest flank of a broad gentle syncline which strikes about north 50° east and is followed by the San Mateo road for some distance. The axis of this fold is marked by a paralleling fault showing a displacement of about 275 feet. The east side is the down-dropped block (see fig. 1).

Minor small-scale folding is present in the uranium-bearing areas and was especially instrumental in localizing the known ore deposits in the Todilto limestone. The folds range from a few inches to a few feet in amplitude. Early work done indicated that they were slumpage folds formed during deposition and prior to lithification. Recent work[4], [5] has shown that the folds form a right angle conjugate pattern which is definitely in alignment with the trends of the major Zuni Uplift structures. In addition to the Todilto, the top of the Entrada and the base of the Summerville formations have been involved in the folding. It is now believed that the folding was caused by the response of the relatively incompetent Todilto to slippage between the competent Summerville and Entrada formations during the Zuni Uplift.

4/ Gilkey, Arthur K., Fracture Pattern of the Zuni Uplift, Second Progress Report: U. S. Atomic Energy Commission, RMO 897, November, 1952.

5/ Op. cit.

Faulting

Contemporaneity of faulting and folding is shown by the fact that one is observed to pass into the other along the strike so that both are probably related to the major uplift. The faulting also has a right angle conjugate pattern similar to the folding and the pattern suggests that they are tensional breaks in response to vertical forces during the Zuni Uplift.

There is very little faulting in the immediate area of the Vopat property. However, to the northwest in the vicinity of the common corner of sections 23 and 25 a considerable amount of faulting, with minor displacement, has taken place (see fig. 1). The distribution of the ore bodies and the faulting as shown do not necessarily indicate a close association of the two.

Jointing

Jointing exhibits patterns similar to folding and faulting, and all indications are that they have originated from common causes. Jointing is partly responsible for localization of the ore shoots.

Mineralization

The ore minerals present in the deposits in the Todilto are chiefly tyuyamunite, pitchblende, carnotite, and uranophane. Fluorite, barite, pyrite, hematite, and limonite are also present in varying amounts.6/ Red alteration halos are noted about dark black pods of pitchblende(personal observation).

ORE DEPOSITS

A satisfactory examination of the property cannot be made because of complete soil cover. In order to evaluate the geologic possibilities for ore occurrence here, attention must be turned to information which has

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6/ Rapaport, Irving, Interim Report on the Ore Deposits of the Grants District, New Mexico: U. S. Atomic Energy Commission, RME 1031, November, 1952.

been obtained from results of exploration in adjoining areas, especially on the west and south. No work has been done east of Vogat's claims. Geologic mapping, drilling, radioactive logging of drill holes and mining has developed what appears to be a trend of the mineralization in this area. Figure 1 shows the trend of the belt, which appears to be favorable for ore occurrence in the areas which have been drilled out to date. This belt is defined in only a general way by connecting the outside boundaries of the known ore bodies within the explored areas. Figure 2 shows the picture close to the Vogat claims on a larger scale at the adjoining properties of the Santa Fe on the south and the Oscar Mund property on the west. It is very suggestive that the Vogat claims lie well within the probable extension of the belt, as defined; thus, the geologic indications may be said to be favorable and a reasonably good chance exists that ore will be found on the property.

Elsewhere in the area definite ore controls have been established which are present in almost all the deposits now being worked. The crests and flanks of small anticlinal flexures are especially favored placed for localization of uranium ore shoots. The reason for this may be that these areas are most permeable due to fracturing and recrystallization due to folding. They may also actually have acted as structural traps for solutions circulating within the formation. The upper thin-bedded formation is said to have larger and richer ore shoots than the lower massive section, which may be explained in the light of relative permeability. The deposits are also said to be largely fillings in joints and fractures with very little replacement and dissemination within the rock itself.7/

7/ Unpublished data, Atomic Energy Commission Office, Grants, New Mexico.

Unfortunately, the folds are so small that they cannot be traced laterally or vertically far enough to be of value in locating ore shoots where cover of younger formations is thick or extensive. However, once the ore has been found, these controls help simplify the extraction and planning of mining operations.

Fortunately, it was possible to check the various geologic aspects in the open pit mine of Oscar Manol on the west side of the Vopat claims. This pit is shown on figure 2 and lies only 2000 feet west of the west side line of the Vopat claims. The showings were very much as described in the literature in the various AEC publications. However, while a great deal of the ore does occur as fracture and joint fillings by tyuyamunite, uranophane, etc., very definite examples of disseminated ore were found in the more massive and thicker beds. A great many pods and fine-grained dense black material (which showed very high reactions approximating 5 to 10% U_3O_8) were found; these are apparently pitchblende. They appear most abundantly in and along bedding planes. These showed various degrees of alteration to the yellow and orange uranium oxide minerals, so that both primary and secondary disseminationed ore occurrences are actually present. According to Manol (personal communication) the black mineral is the material "which really raises the grade of the ore." It was also noted that this material is accompanied by red halos, which should serve as additional guides for identification of this "high grade." It would seem most likely that the high grade occurrences are hydrothermal replacements and that most of the other secondary minerals have been derived from them.

The irregularity of the distribution of the ore shoots and the small size of their occurrences are indicated on figures 1 and 2. Quite a large number of deposits have been found in the northwest portion of the

belt where faulting is most abundant, but just as many occur along the belt of mineralization where there is no appreciable faulting recorded. Enough evidence to fully explain the distributions has not yet been assembled.

The bodies which have been found and may yet be expected to be found are very small. They range from those containing a few hundred tons to those which may contain a few thousand. To date only about 100,000 tons of ore has been shipped from this Grants area. Production on the property west of the Vogel claims has been exceptionally good. Three thousand tons have been shipped from here to date, which probably averaged about .25% U_3O_8. Most of this has come from the larger pit shown on figure 2. The cut-off grade for mining here is not a static figure and is dependent upon the factor of depth of rock or soil cover - whether the ore body can be mined by open pit or underground methods. It is also dependent upon the indicated tonnage. To date almost all production has come from relatively cheap open-pit mining - no "yardstick" cut-off grade has been established for underground mining to date here.

METHOD OF EXPLORATION

The nature of these occurrences of uranium - relatively shallow-seated, rich, small and irregularly spaced shoots or bodies - requires that the areas to be explored must be drilled very closely. To date the standard pattern developed as the most reliable method is drilling on a grid pattern with 100 foot centers. Within this pattern it is safe to assume that no significant ore body will be entirely missed. "Fill in" holes are then needed to close in around anomalous primary grid holes in order to delimit the ore occurrence. Fortunately, most of the area under exploration (to date) has very shallow or no covering on the favorable horizon and drilling can be

done relatively cheaply at 50¢ / foot. Eventually the Todilto area, under the cover of younger formations of the Morrison group, will be considered for exploration and drilling will be vastly more expensive.

Method of Sampling

At the present time no sampling is being done on the holes being drilled for exploration work in the area. The operators are entirely dependent upon the AEC logging device, based upon the use of the scintillometer for determining what constitutes ore or where the cut-off occurs. Several operators in the area were consulted and they expressed the opinion that the logging device was far better than sampling core or blowing out the cuttings for sample and assay from a hole at various intervals. They believe it to be more accurate and dependable by far. It appears that this instrument is a fine and indispensable guide for uranium production in the area. The principal question which arises now is whether or not the field team will accept this method as a substitute for sampling and chemical assaying in the contract. Since the operator must, in his final report, provide an estimate of ore reserves - tonnage and grade - he will have to have one of the two methods to guide him. If the AEC logging method can be used, it will eliminate half the cost of class two (fill-in) holes, sampling and assaying, which represents between five and six thousand dollars.

The AEC field men have been instructed not to take responsibility for calculating tonnage and grade with the logging device. However, it was intimated that it could be done at least to a reasonable degree of accuracy by calibration. Several operators stated that it could be done to the satisfaction of practical operation. It is felt that this is a technical matter to be solved by the field team and the AEC, but it is believed that

acceptance of the logging method over the more expensive sampling of the drill holes and chemical assaying should be made if it is feasible to do so.

CONCLUSIONS

The Vogat property is entirely covered by soil and no outcrops are visible. Therefore, the property must be evaluated in the light of information from the adjacent operating and previously explored properties.

There is a reasonably good chance to find uranium ore bodies of economic proportions on the Vogat property. This conclusion is based upon reliable information from the nearby mining operations and from the Atomic Energy Commission personnel. The property lies well within the projected boundaries of what appears to be a favorable zone for the localization of uranium mineralization. The boundaries of this zone are generally defined by the results of exploratory drilling and mining on the west and south sides of the Vogat property.

The ore will be contained within the Todilto formation of Jurassic age, which is principally a limestone. It varies from 8 to 80 feet in thickness and the ore may occur at any horizon within it.

The ore bodies which may be found will occur from 6 to perhaps 75 feet beneath the surface. They will very likely be small, and the production from them will probably range from a few hundred to a few thousand tons of ore. The average grade will approximate .25% U_3O_8; this is the average of 3000 tons of ore produced from an adjoining property on the west. The economic limits of mining will be defined largely by the depth of the bodies from the surface.

The occurrence of the ore is governed by small geologic structures such as folds and jointing which are not persistent laterally or vertically for appreciable distances and have no predictable trend. They are not good

guides for exploration, particularly in the case of the Vopat property, but they are very helpful in the mining operations as guides in following the ore.

Because of the small size and erratic distribution of the ore bodies which can be expected, and the lack of structural controls which can be utilized in exploration planning, it is necessary and standard practice to drill areas on grid patterns with 100 foot centers. Additional drilling to close in on ore bearing grid holes is necessitated to delimit an ore body.

If the field team will accept the use of the scintillometer logging device to determine tonnage and grade in this particular program in place of sampling and chemical assaying, several thousand dollars can be saved.

DMEA-2897, FLAT TOP-VILATIE HYDE URANIUM CLAIMS
McKINLEY COUNTY, NEW MEXICO

Engineering Report

By M. J. Elsing
Consulting Mining Engineer
U. S. Bureau of Mines

June 1953

DMRA-2897, FLAT TOP-VILATIE HYDE URANIUM CLAIMS
McKINLEY COUNTY, NEW MEXICO

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INTRODUCTION

On February 17, 1953, the Field Team, Region IV, of the Defense Minerals Exploration Administration requested that an examination and report be made on the feasibility of Government assistance in the amount of $19,141 for the exploration for uranium on the Flat Top-Vilatic Hyde claims, McKinley County, N. Mex. The application was made by Richard Vopat (a partnership). The project has been given Docket No. DMEA-2897 (Uranium).

On June 2, 1953, M. J. Elsing and J. H. Haynes of the U. S. Bureau of Mines in company with Paul E. Melancon of the Atomic Energy Commission at Grants visited the property.

LOCATION

The property includes 2-2/3 claims covering 46.67 acres and is located in the south half of the southeast quarter of Sec. 30, T. 13 N., R. 9 W., McKinley County, N. Mex. (see figure 1).

The property is approximately 14 miles northwest of Grants, N. Mex., which will be the supply center and living quarters for men employed at the project.

The property is reached from the Atomic Energy Commission office in Grants by travelling west on U. S. Highway 66 for 3.2 miles. At that point State HIghway 63 (San Mateo road) is followed to the north for 11.1 miles where a turn is made to the west passing through a gate near which the property is entered.

From the property it is approximately 16 miles to the Anaconda Copper Co.'s buying station situated at Blue Water, N. Mex.

OWNERSHIP AND EXTENT

The property comprises 3 unpatented mining claims known as Flat Top-Vilatie Hyde Nos. 1 to 3, inclusive, the titles to which are recorded in the County Recorder's Office at Gallup, N. Mex., the county seat of McKinley County, in the book of Miscellaneous Records and at the page number shown below:

Claim	Book	Page
Flat Top-Vilatie Hyde #1	10	287
Flat Top-Vilatie Hyde #2	10	288
Flat Top-Vilatie Hyde #3	10	288

The property is owned by a partnership including:

Richard Vopat, 601 Court St., Scott City, Kansas;
Howard T. Young, 911 Church St., Scott City, Kansas;
Dr. R. H. Spencer, 606 Russell St., Scott City, Kansas;
Fred W. Heine, Lucas, Kansas;
Robert R. McNeely, 337 So. Terrace Dr., Wichita, Kansas.

The original owner of these claims was Mrs. Vilatie Hyde, Blue Water, N. Mex. Mrs. Hyde has retained a perpetual 5 percent royalty interest in production, and Frank Manol, Aztec, N. Mex., has a perpetual 10 percent royalty interest by virtue of turning the property from Mrs. Hyde to the partnership.

The area in which the Flat Top-Vilatie Hyde claims are located has been withdrawn from mineral entry for the Atomic Energy Commission. However, these claims were located prior to this withdrawal. Vopat stated that in order to establish title to these claims, suit to quiet title was brought and the title was established beyond any question.

In order to establish ownership of these claims Vopat submitted information which shows the more important links in the chain of title as follows:

(1) Original location notices filed December 11, 1950 and followed by amended locations;

(2) As part of an escrow agreement, Mrs. Vilatie Hyde and Arthur W. Hyde on December 17, 1951 filed a warranty deed in favor of Frank O. Manol and Hazel I. Manol;

(3) On January 10, 1952, the Manols gave a quit claimdeed to Richard Vopat for a 1/5 interest in the property.

Vopat stated that the Quiet Title action was the result of differences between the Hydes and the Manols and that their differences were compromised by providing the already mentioned royalty payments.

Paul Melancon, representative of the Atomic Energy Commission at Grants, advised the examiner that the location of the claims was prior to the land withdrawal order, and therefore valid.

The power of attorney authorizing Vopat to negotiate an exploration contract with the Defense Minerals Exploration Administration, signed May 11, 1953 by Heine, Young, Spencer, and McNeely has been attached to the docket, along with a copy of the quit claim deed to 1/5 of the property from the Manols to Vopat, dated January 19, 1953. This deed was recorded February 5, 1952 in the office of the Clerk of McKinley County in Book 6 of Q. C. Deeds, page 438.

The Manels are reported to have executed four similar quit claim deeds to a 1/5 interest in the property to Heine, Young, Spencer, and McNeely. Copies of these deeds were not seen but it seems reasonable to assume that they exist as Heine, Young, Spencer, and McNelly would not have given a power of attorney to Vopat if this were not the case.

PROJECT PROPOSALS

The Flat Top-Vilatie Hyde claims No. 1 to No. 3, inclusive, are to be explored by drilling on a grid pattern with holes at 100-foot intervals. Having found ore in any hole it is proposed to drill 4 fill-in holes at 10- to 25-feet intervals in 4 directions from the primary discovery hole (see figure 2).

The area to be drilled is 1,300 by 1,550 feet. The southwest corner of this area, comprising a section approximately 300 feet by 600 feet, already has been incompletely and unsatisfactorily drilled by the applicant, using a wagon drill. The diameter of these holes was too small to be probed with the Atomic Energy Commission's scintillometer and their position does not conform to a general grid pattern as now planned. It is proposed to drill 8 holes in the area drilled by Vopat. The balance of the area will require 189 holes. Therefore, the total number of primary holes will be 197.

The depth of these holes will vary from 16 to 100 feet with an average estimated depth of 70 feet. The past history of drilling in the area adjoining this property indicates that one-sixth of the holes to be drilled will encounter mineralization of sufficient interest

to warrant drilling the 4 fill-in holes surrounding the original hole. On this basis it is estimated that 132 fill-in holes will be drilled, each of which will average 70 feet in depth.

W. T. Myers of the W. T. Myers Drilling Co. of Lovington, N. Mex., has submitted the following bid on the drilling:

"Mr. Richard Vopat
Scott City, Kansas

"Dear Mr. Vopat:

"The following bid is submitted on your project located in the SW ¼, SE ¼, of Section 30, T. 3 N., R. 9 W., Valencia County, Grants, New Mexico:

Class 1 drilling: Plain hole, no casing.

1st 100 feet or any part thereof	$ .50 per foot
2nd 100 feet or any part thereof	1.00 per foot
3rd 100 feet or any part thereof	1.50 per foot
4th 100 feet or any part thereof	2.00 per foot
5th 100 feet or any part thereof	2.50 per foot

Class 2 drilling: Hole as above but blown clean of cutting every two feet.

1st 100 feet or any part thereof	$1.00 per foot
2nd 100 feet or any part thereof	1.50 per foot
3rd 100 feet or any part thereof	2.00 per foot
4th 100 feet or any part thereof	2.50 per foot
5th 100 feet or any part thereof	3.00 per foot

Class 3 drilling: Coring in formations amenable to coring.

1st 100 feet or any part thereof	$3.00 per foot
2nd 100 feet or any part thereof	3.50 per foot
3rd 100 feet or any part thereof	4.00 per foot
4th 100 feet or any part thereof	4.50 per foot
5th 100 feet or any part thereof	5.00 per foot

"Cementing holes and drilling cement plug in fractures and cavities where practical, $3.00 per foot in any depth zone. Standby time $9.00 per hour for delays at your request and account. In the event of such fractures, watercourses, and cavities which make it necessary or advisable to skid our rig, we are to be paid for footage drilled to such a point.

"All three classes of drilling may be combined in any hole in any proportion. We also want to call to your attention that a 500 foot plain hole will average only $1.50 per foot at the above rates. Shorter holes will be proportionately lower.

"The above prices cover all costs of equipment, labor, tools, supplies, materials, payroll taxes, and insurances.

W. T. Myers Drilling Company

By /s/ W. T. Myers
W. T. Myers"

The proposed project can be broken down into 5 parts as follows:

Part I will include drilling the 197 primary exploration holes, the average depth of which will be 70 feet. A total of 13,790 feet of drilling will be done at an average contract price of $0.64 per feet, or a total of $8,826 (50 ft. @ $0.50 and 20 ft. @ $1.00 for each hole).

Part 2 will include drilling 138 fill-in holes, the average depth of which will be 70 feet.

It is known that ore, if present, will be found in a bed of limestone which averages about 20 feet in thickness. The past record of drilling in the district also shows that the ore in any one hole may have a total thickness of approximately 5 feet and may consist of one or more mineralized beds in the limestone. The elevation of the ore horizon in the primary holes will be located by a scintillometer and the fill-in holes will be drilled on the basis of this information. The first 50 feet of hole will be drilled under Class 1 of the drilling contract at a cost of $0.50 per foot, and 20 feet under Class 2 at $1.00 per foot. Class 2 drilling provides for blowing the hole clean of cuttings every 2 feet. There will be 10 samples for each hole. The 132 fill-in holes will cost $45 each (50 feet @ $0.50 and 20 feet @ $1.00), or a total of $5,940.

Part 3 of the project provides for chemical assaying. As soon as a hole enters the limestone the drill cuttings will be blown from the hole at each 2-foot interval and caught in a collector. On the assumption that the limestone ore horizon is 20 feet thick, there will be 10 samples for each hole. A Geiger counter will be used to determine which of these 10 samples should be assayed chemically. Since the average thickness of the ore is approximately 5 feet, not more than 3 2-foot samples will need to be assayed and if necessary two could be combined for one assay. Assaying usually costs $5.00 per sample. With transportation and the cost of sacks the cost per sample is estimated at $7.50.

A total of $1,500 has been set up for assaying. This provides for 200 samples at $7.50 each. This should cover transportation including express, chemical assaying, sample sacks, and some check assaying by Ledoux & Co. or some other very reliable umpire.

Part 4 includes supervision, engineering, and miscellaneous expenses, and Part 5 includes items considered to be capital equipment but not paid for under the contract.

TIME SCHEDULE

The contractor has estimated that the maximum drilling footage will be 400 feet per shift and that the average will be 300 feet per shift. Work probably will be done on a 6-day week and confined to the day shift only. The total footage of primary holes is 13,790 feet, and with drilling at the rate of 300 feet per shift, the drilling time will be 7.7 weeks.

There are 9,240 feet of fill-in holes, the drilling of which will be at the rate of approximately 300 feet per shift. The time required for drilling these holes will be 5.2 weeks, or for all drilling the overall time required will be about 3.0 months. Costs are set up on the basis of one half month to prepare for drilling and one half month after drilling to complete assaying and make the final report on the project. This is a total of 4.0 months.

PERSONNEL AND DUTIES

Practically all work at the property will be done by a contract driller but there will have to be a supervisor and a part time engineer. Both are readily available. Richard Vopat, a partner in the project, will be the supervisor. He has suggested that he be employed at a daily rate but it is preferable that he work on a monthly salary basis. His duties would be to help the engineer lay out and stake each hole to be drilled, measure and keep a record of the footage of each hole drilled, and see that the contractor keeps daily log records of drilling which the supervisor should file for future reference. He should observe the taking of samples, properly number and describe each, test each sample with a Geiger counter and send high-grade samples to an assayer for the determination of uranium by a chemical process. He should keep charts, maps, and all necessary data, including the location of each sample, its assay grade, location in the hole, and the footage extent of the sample. The method of keeping these records should be set up by the applicant's engineer and the Government's examining engineer should be advised of the records to be kept.

The supervisor should keep all books, accounts and monthly reports in connection with the project and pay all bills.

At the end of the project, the supervisor with the engineer should make a final report on the project.

There is nothing difficult about the duties to be performed but it is a full time job and the supervisor should be expected to be at the property during the entire time that drilling is being done.

The services of an employed engineer living at Grants, N. Mex. are available on Saturdays and Sundays, and possibly other days or parts of days during the week.

The engineer's duties would be as follows:

Lay out and stake all holes to be drilled with the help of the supervisor. This should not require more than a maximum of 3 days. When sampling starts the engineer should be allowed one day to observe and approve the method of sampling and devise a system of keeping sample records in a notebook and on sample maps.

Upon completion of the project the engineer should assist the supervisor in preparing a final report on the project. His particular duties would be to prepare assay maps and ore reserve calculations and other engineering data relative to the project. Three days should be ample to permit this.

Since the supervisor has had no engineering experience it would be advisable to make the engineer available for consultative advice by phone or in person. A total of five days has been allowed for this.

A total of 12 days has been allowed in the project for engineering as shown above.

It is suggested that the pay for the engineer be $27.50 per day, including transportation to and from the mine.

ESTIMATED COSTS OF PROJECT

The following is a summary of the estimate of costs:

Contract drilling		
Primary holes, 13,790 feet @ 64¢ (30 ft. each hole at 50¢; 20 ft. @ $1.00)	$8,826	
Fill-in holes, 9,240 ft. @ 64¢	5,914	
Total, 23,030 feet @ 64¢		$14,740
Assaying, including transportation		
200 samples @ $7.50		1,500
Supervisor		
4 months @ $500, plus 11% for insurance, taxes, etc. (See breakdown which follows)		2,220
Engineering		
12 days @ $27.50, plus 11% for insurance, taxes, etc. (See breakdown which follows)		366
Other Expenses		
Stationery, postage, typing	$75	
Miscellaneous	100	175
Filling Holes		150
Capital Equipment (not allowed)		
Geiger counter and sample splitter		None
Miscellaneous above		$4,411
Drilling by contract		14,740
Total cost of project		$19,141

On this basis the actual cost of drilling will be 54 cents per foot and the incidental and other expenses including supervision and assaying will be 19 cents per foot making a total of 83 cents per foot, which is the price suggested for a short term contract.

Breakdown of Salaries

This figure is an estimated average and may be different for different companies and different individuals. In this estimate the following factors have been used which are as accurate as can be obtained.

Supervisor	Per Month
Salary	$500.00
Old Age Benefits, 1.5% (up to $3,600)	7.50
Federal Unemployment Ins., 0.3%	1.50
N. Mex. Unemployment Ins., 2.7% (up to $3,600; 0.3% thereafter)	13.50
N. Mex. School Tax, approx. 1%	5.00
Workmens Compensation Insurance, Incl. Occupational Diseases varies from 3.984% to 6.1%, estimated at 5.5%	27.50
per month	$ 555.00
4 months	$2,220.00

Engineer	12 days
Salary, 12 days at $27.50	$ 330.00
Old Age Benefits, 1.5%	4.95
Federal Unemployment Ins., 0.3%	.99
N. Mex. Unemployment Ins., 2.7%	8.91
N. Mex. School Tax, approx. 1%	3.30
Workmens Compensation Ins. (estimated at 5.5%)	18.15
Total	$366.30

It is believed that the applicant's salary cannot be materially reduced as his living expenses in Grants will be high and he will have an auto expense of approximately $1.50 per day, or $45 per month which his salary is supposed to include.

OPERATIONAL PROCEDURE

Operational procedure can be outlined only tentatively and should be varied to meet conditions. The schedule of work can be forecast approximately as follows:

(1) The supervisor and engineer will lay out and stake all primary holes;

(2) Ayers will start drilling primary holes. It is understood that the Grants office of A.E.C. will probe all primary holes with a scintillometer and will report findings a s drilling progresses. It is believed that as soon as one of the primary holes shows ore of importance that the applicant should be allowed to start drilling the fill-in holes but only after such drilling has been recommended by the A.E.C. engineer and approved by the AMA engineers.

The distance of the fill-in hole from the primary hole should be recommended by the A.E.C. and approved by the AMA examiners.

The object of allowing the drilling of fill-in holes before completion of the primary drilling is to obtain as much information as possible as drilling progresses and if possible to find an ore body which could be mined even before the completion of the entire program.

(3) Upon the discovery of ore in a hole the supervisor should, with the advice of the engineer, approve the sampling method and see that samples are taken, identified with tags, tested with a Geiger counter and if necessary have the sample assayed chemically.

(4) Upon completion of a hole it should be covered with a flat rock and its location should be indicated by a stake. This should be the obligation of the driller.

(5) It should be the duty of the supervisor to prepare his reports at the end of the month showing costs and particularly the footage of Class No. 1 holes drilled and Class No. 2 holes.

PROPOSED FINANCING

The project as set up provides for the expenditure of $19,141 of which the applicant proposes to furnish one-tenth or $1,914 and requests that the Government provide $17,227.

CONCLUSIONS

On the basis of the findings on ground developed by Manol to the west and on discoveries on the Santa Fe Railroad ground immediately to the south, it seems that the Flat Top-Vilatie Hyde claims should be equally productive and that the ore bodies will be of more or less the same size and grade. The ore bodies in the district have been small and high grade which accounts for the close spacing of the primary drilling as well as the fill-in drilling. The whole project has been set up upon the generally accepted practise in the district which has the approval of the local A.E.C. officials.

In a letter dated March 3, 1953, from Paul E. Melancon, District Geologist, Atomic Energy Commission, Grants, N. Mex., to A. F. Shride, Acting District Supervisor, Arizona-New Mexico, U. S. Geological Survey, Tucson, Ariz., Melancon stated:

"In regard to your letter of February 26, 1953 regarding the request for a DMEA loan on the Vilatie Hyde claims on sec. 30, T. 13 N., R. 9 W., McKinley County, NewMexico, the property is definitely worth considering for a loan.

"The property is located near a deposit which produced over $60,000 worth of ore in less than three months, and the northern part of the area may be along what appears to be a mineralized trend in which a large tonnage was developed by the Santa Fe Railway in the adjacent section to the west.

"The drilling pattern suggested by the applicants is normal for exploration in the limestone, and it has been used extensively and fairly successfully by both Anaconda and the Santa Fe."

Myers has submitted an extremely low bid for drilling and were it not for the fact that he has been operating for some time in the area and officials of the Atomic Energy Commission have recommended him as a competent driller, his cost estimate of drilling would be accepted with some doubt.

Should drilling of the primary holes listed as Part 1 of the project be unfavorable, it is conceivable that the project should be stopped even before the completion of these holes. For example, if 75 to 100 of the primary holes on 100-foot coordinates were barren it would be advisable to continue drilling at 200-foot coordinates. If these were barren it would be best to stop the project.

The project requires close watching. In a sense it is pioneering because the project differs from the Manol operation in that the Manol deposits either outcrop or are covered by only a few feet of overburden.

In the case of the Vilatie Hyde claims there may be as much as 60 to 70 feet of overburden. To remove 30 or 35 feet of overburden would not be too serious but if the overburden is 60 to 70 feet with a small ore body, waste removal becomes serious because of the excessive amount of material that has to be removed due to the flat slopes of an open pit in soft sandy material.

The grade of the ore at the Manal property is 0.25 percent U_3O_8. The costs and profits are unknown. It is certain that on Vilatie Hyde ground if the grade is 0.25 percent the costs will be higher and the profits will be less. As the depth of overburden increases the vanishing point of profits will be reached. This depth is unknown and there are insufficient data to calculate it. There are many unknown variables and an estimate of costs would be only a guess. As an exploration project especially for uranium, these data are not too important. The main consideration is to find uranium ore of somewhere near a profitable grade. On the other hand this does not warrant continuing drilling beyond the point where it is reasonably certain that substantial amounts of ore will not be found.

RECOMMENDATIONS

Because of the discovery and production of uranium ore from the areas immediately to the west and to the south of the Flat-Top Vilatie Hyde claims, and because the geological and structural conditions are almost identical to these areas, it is recommended that the project of Richard Vopat for the exploration of these claims be approved on the basis of a total expenditure of $19,141.

Rec'd 9/3

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
SEP 4 - 1953

913

August 27, 1953

224 New Customhouse
Denver 2, Colorado

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 20

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2897 (Uranium), Flat Top-Vilatie Hyde claims, McKinley County, New Mexico

Enclosed are four copies of the final report on the subject docket. The Field Team recommended drilling in the amount of $4,531.80 but the applicant failed to furnish necessary information for the preparation of a contract. The application has been placed in our inactive file.

Two copies of Form 3b are attached.

/s/ W. H. King
W. H. King

/s/ A. H. Koschmann
A. H. Koschmann

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

August 27, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2897 (Uranium), Flat Top-Vilatie Hyde Uranium Claims, McKinley County, New Mexico.

Enclosed are eleven copies of the final engineering report on the subject docket.

The applicant requested $19,000.00 to wagon drill 189 holes on a 100 foot grid pattern. The engineer examiner recommended the same amount of drilling.

The Field Team considered this amount of drilling to be excessive and asked R. P. Fischer for his comments and he concurred with the Field Team in recommending the drilling of forty-six primary holes.

The applicant has failed to furnish information necessary for the preparation of the contract and the application has been placed in the inactive file.

W. H. King
W. H. King

Enclosures

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P. O. Box 360
Grand Junction, Colorado

August 18, 1953

Memorandum

To: W. H. King
A. H. Koschmann

From: R. P. Fischer

Subject: Comments regarding DMEA 2897

The report on the field examination, DMEA 2897, Flat Top-Vilatie Hyde claims, McKinley County, New Mexico, and a modified recommendation by the field team was sent to this office for review. I referred the problem to J. D. Strobell, USGS geologist, who is familiar with the area. His comments are incorporated in a memorandum to me, four copies of which are attached.

Strobell believes the area of the applicant's claims to be favorable for finding uranium ore, and that the modified plan of exploration suggested by the Field Team is sound, provided arrangements are made to obtain radiometric logs of the wide-spaced drill holes. Strobell points out, however, certain mining problems in the area of these claims, and questions whether the expected amount of ore that might be found will be enough to repay the DMEA loan.

I believe Strobell's statement presents the problem clearly and gives enough information to permit the preparation of an exploration contract if the application is approved.

Returned herewith are the original copies of the Geological Survey and the Bureau of Mines final reports on the subject docket, together with a copy of the brochure. Also returned herewith are two copies of figure 2--one showing the drill holes recommended by the field examiners, and the other showing the modified pattern recommended by the field team.

R. P. Fischer
Acting District Supervisor
Colorado Plateau District

Enclosures

cc: King and Koschmann (3)

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

August 18, 1953

Memorandum

To: R. P. Fischer, Acting District Supervisor

From: J. D. Strobell, Jr., Geologist

Subject: Flat Top-Vilatie Hyde claims, McKinley County, New Mexico, DMEA 2897 (Uranium)

Application was made by Richard Vopat for federal assistance in exploring the three Flat-Top Vilatie Hyde claims in sec. 30, T. 13 N., R. 9 W., McKinley County, New Mexico. The applicant proposed to spend $19,000. The property has been examined by the Bureau of Mines and Geological Survey. Their reports and a suggestion by the Field Team have been referred to the Colorado Plateau District office for comment.

I have reviewed the applicant's proposal and the examiners' recommendations, and have myself been on the property (June 2, 1953, and August 11, 1953) in connection with examination of the adjacent F. O. Manol property. Through Mr. P. E. Melancon, District Geologist of the U. S. Atomic Energy Commission at Grants, New Mexico, much pertinent information about exploration and development in the vicinity of the Flat Top-Vilatie Hyde claims was made available.

The applicant proposed to drill the property on 100-foot centers and to offset favorable holes at distances of 10 to 25 feet. The examiners allowed 197 primary holes spaced 100 feet apart and 132 closer spaced offset holes. The Field Team suggests that the primary holes be spaced 200 feet apart in a staggered pattern having alternate rows offset 100 feet; this suggestion would require only 46 primary holes.

I concur with the last suggestion but would add four holes near the east edge of the property (see figure 2) and would include one important proviso, namely that the wider spacing of the primary holes be used in conjunction with radiometric logging of these holes.

The geologic report by Robinson gives a complete and accurate summary of available information. As pointed out by him, exploration to the south of the Flat Top-Vilatie Hyde claims by the Santa Fe Railroad and to the west by F. O. Manol and the Santa Fe suggests that these claims lie in a vaguely defined belt of mineralized ground. This exploration in secs. 25, 30, and 31 found about 25 ore bodies in a total drilling area of nearly 1 square mile. These ore bodies are estimated to contain about 80,000 tons of ore averaging about 0.20 to 0.25 percent U_3O_8. The average ore-body thus contains about 3,000 tons of ore. Assuming this same frequency of ore occurrence

(25 ore bodies per square mile), one or two such bodies would expectably be found on the Flat Top-Vilatie Hyde claims which have a total area of slightly more than 1/16 of a square mile. There thus appears to be a favorable chance of finding 3,000 to 6,000 tons of ore on these claims.

Ore of this grade (0.20-0.25% U_3O_8) would be worth from $14.00 to $18.25 per ton (base price plus premium). Repayment of the loan at 5% would thus return to the Government between $0.70 and $0.9125 per ton. If the operator would agree to subject his bonus to the lien he would repay an additional $0.70 to $0.8750 per ton on the first 2,000 to 2,500 tons only. Hence it appears that if 6,000 tons of ore of this grade are discovered, repayment of between $4,200 and $7,225 can be expected. Perhaps, therefore, the costs of the proposed federally aided exploration should be reduced below the amount applied for. One method of accomplishing this which might be successful would be wider spacing of the primary drill holes.

According to the examiners' reports, the ore-bearing limestone on the Flat Top-Vilatie Hyde claims is buried beneath 6 to 75 feet of "soil cover," and the average depth of holes is estimated to be 70 feet. As the limestone is itself on the order of 20 feet thick, the average depth of cover would appear to be about 50 feet. The "cover" in most parts of these claims consists of windblown sand and alluvium which would have to be stripped in mining as neither the sand nor the limestone would support a roof for underground work. The average thickness of the cover is considerably larger than that being stripped elsewhere in the district. Costs of stripping might be so significantly higher than other current operations in the district as to require larger or richer ore bodies in order to justify mining. This consideration also seems to me to recommend the wider spacing of the primary drill holes.

The ore bodies already found in the vicinity of the Flat Top - Vilatie Hyde claims range in area from about 25 x 25 feet to 800 x 100 feet. Most of them are elongated, the length being several times the width. According to Mr. Melancon, they are surrounded by a zone in which the radioactivity is measurably higher than the radiation background of limestone, and such zones of increased radioactivity may extend as much as 100 feet beyond the limits of ore.

In order to find the expected amount of ore, primary drilling on 100-foot centers would be necessary in order to intersect the small, elongated ore bodies. If, however, advantage be taken of the radioactive "halo," I believe primary drilling could be done on 200-foot centers. Radiometric logging of the drill holes would give this advantage. Without radiometric logging, negative results on a 200-foot spacing would not disprove the area drilled, because an ore body up to 200 feet in diameter and containing as much as 10,000 tons could be completely missed. With radiometric logging, the radioactive halo around such an ore body would expectably be intersected by at least one hole.

Radiometric logging to determine this relatively "favorable" ground has been done by the Atomic Energy Commission with scintillometer equipment and by some operators with simple geiger counters having long cords on the probes. In-hole logging may also soon be available commercially in the district through Manol and Rappaport.

Use of in-hole radiometric logging would permit the primary holes to be drilled without sampling and provide another saving. But all offset holes should be sampled through the entire thickness of the limestone, because radiometric logging has not as yet been demonstrated to yield reliable determinations of grade. Radiometric logging or scanning of the samples can, however, be used to select the samples of potential ore-grade for assaying.

Because of the small size of the deposits, I would add the four primary holes circled in ink on figure 2, to the scheme suggested by the Field Team. Too large an area is left untested by omitting these holes.

The amount of offset drilling that will be needed to complete the project is difficult to estimate. Judging again for the distribution of the known deposits, 10 to 20 percent of the area might merit further testing by closer spaced drilling, and up to 2 or 3 percent of the area might be underlain by ore-grade material.

It should be pointed out that the ore occurs throughout the limestone at all positions between top and bottom. In order to insure drilling through the entire thickness, all holes should penetrate at least 2 feet into the underlying sandstone. If in-hole logging is contemplated, the hole should be drilled 5 feet below the base of the limestone, especially in thedeeper holes. This insures being able to log the entire thickness of the limestone even though the hole is partly filled by sloughing. I am not sure that this factor was considered by the examiners in arriving at their estimated average depth of hole.

J. D. Strobell, Jr.
Geologist

JDS/je

cc: King and Koschmann (4)
Reading file

MINING DIVISION
REGION IV

June 18, 1953

Memorandum

To : W. L. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMA-2897, Flat Top-Vilatic Hyde Uranium Claims, McKinley County, N. Mex.

Enclosed are original and 10 copies of the section on Summary, Conclusions and Recommendations by A. J. Alsing of the Bureau of Mines and R. F. Robinson of the Geological Survey, and the section on Engineering by Alsing. A separate section on geology will be submitted by the Geological Survey.

As a substantial amount of uranium ore may be discovered by this exploratory project, the examiners recommend that a loan for $19,141 be granted the applicant. I concur with their recommendations.

Brochure is enclosed as are 9 copies of Figure 2 for a possible contract.

Walter R. Storms

Walter R. Storms

CC W. L. King (10)
R. F. Robinson
DMA-2897
DI

WRStorms:frj

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

200 New Customhouse
Denver 2, Colorado

June 8, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2897, Flat Top-Villatie Hyde Claims (Uranium), McKinley County, New Mexico.

Enclosed are the original and 10 copies of the geologic report by Raymond F. Robinson of the U. S. Geological Survey covering the above docket.

It has been recommended that the loan be approved.

The brochure is enclosed.

A. H. Koschmann

A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (12)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P.O.Box 4126, University Station
Tucson 5, Arizona

June 4, 1953

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: Raymond F. Robinson, Tucson, Arizona

Subject: Geologic Report, DMEA 2897, Flat Top-Vilatie Ryde Claims (Uranium), McKinley County, New Mexico

Accompanying this letter are the original and 10 copies of the geologic report on the subject docket. A separate engineering report has been submitted, although the U. S. Bureau of Mines did not participate in the examination.

The writer is of the opinion that the results of exploration and mining in the vicinity of the Vegat, et al property indicates a trend in the distribution of economic quantities of uranium mineralization. The Vegat, et al property lies well within the southeasterly extension of this favorable zone and it appears that there is a reasonably good chance to discover new ore bodies on it.

It is recommended that a DMEA loan totalling $19,736 for complete drilling of the property be granted. The Government's share of this program will be $17,762.

The field team should consider the possibility of substituting the scintillometer logging device of the Atomic Energy Commission for sampling and assaying in the proposed program. If this can be done, several thousand dollars allotted for the eliminated items can be saved.

The brochure is enclosed.

Raymond F. Robinson
Raymond F. Robinson
Acting District Supervisor
Arizona-New Mexico

Enclosures 11

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2897, Flat Top-Vilatie Hyde Uranium Claims

McKinley County, New Mexico

H. J. Elsing, Consulting Mining Engineer
U. S. Bureau of Mines

R. F. Robinson, Geologist
U. S. Geological Survey

June 1953

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

M. J. Alsing[1] and R. F. Robinson[2]

On February 17, 1953, the Field Team of Region IV, Defense Minerals Exploration Administration, requested that an examination and report be made on the feasibility of Government assistance in the amount of $19,141 for the exploration of uranium on the Flat Top-Vilatie Hyde claims, McKinley County, N. Mex. The application was made by Richard Vopat (a partnership). The project has been given Docket No. DMEA-2897 (Uranium).

On May 4 - 6, 1953, R. F. Robinson went to Grants, N. Mex., met Vopat and with him examined the property. Robinson also interviewed various Atomic Energy Commission officials, including the district geologist. M. J. Alsing and J. F. Haynes of the Bureau of Mines, accompanied by Paul E. Melancon of the Atomic Energy Commission at Grants, visited the property on June 2, 1953.

The property is situated 14.3 miles northwest of Grants in McKinley County, N. Mex. and is entirely covered by sandy soil. No outcrops are present. Therefore, it must be evaluated entirely on the basis of information from adjoining areas.

The property consists of 3 unpatented claims comprising approximately 46 acres. These claims cover a nearly rectangular area, 1,550 feet in an east-west direction and 1,300 feet in a north-south direction. The Oscar Manel property lies immediately to the west,

---

1/ Consulting Mining Engineer, U. S. Bureau of Mines
2/ Geologist, U. S. Geological Survey

and property of the Santa Fe Railway is immediately to the south. Both of these properties are producing high-grade uranium ore from small ore bodies.

Based on the past history of the operation of these properties, the following conclusions have been drawn:

(1) The property lies within the projected boundaries of what appears to be a favorable zone for uranium mineralization which has been defined by drilling and mining for uranium to the west and south of the property.

(2) The ore bodies which may be found will probably be small, the production of which will range from a few hundred to a few thousand tons of ore. The grade probably will average 0.25 percent U_3O_8 as this is the average of 3,000 tons of ore which has been produced to date on an adjacent property.

(3) The ore will be contained in the Jurassic Todilto limestone. The ore bodies probably will occur from a few feet to 100 feet below the surface. The Todilto limestone on this property varies from 8 to 20 feet in thickness, depending upon the amount of erosion, and the ore may be found at any horizon within it.

(4) The occurrence of the ore is governed by small geologic structures which are not persistent laterally or vertically for large distances and have no predictable trend.

(5) Because of the small size of the ore body and unpredictable extent of the structural controls, it is standard practice to drill areas on a 100-foot center grid pattern. Having discovered ore in one hole it is necessary to delineate the ore body with additional closer spaced holes.

Exploration will consist of drilling 4-inch dry holes with a rotary rig. The W. T. Myers Drilling Co. has agreed to drill holes up to 100 feet in depth for $0.50 per foot. When the ore bearing limestone is encountered, holes will be blown at 2-foot intervals and a sample will be recovered. The cost of drilling this type of hole will be $1.00 per foot for holes up to 100 feet in depth.

The proposed project calls for a total expenditure of $19,141 for drilling 23,030 feet of hole, and all other expenses including supervision, assaying, engineering, bookkeeping, and capital expenditures.

The district geologist of the Atomic Energy Commission is familiar with the area. In a letter, dated May 26, 1953, he stated that the property is definitely worth considering for a lease. He further stated that the proposed drilling pattern is normal for exploration in the limestone, and it has been used extensively and fairly successfully by both Anaconda and the Santa Fe Railway.

The cost of this project, considering the amount of work to be done, is exceptionally low. Myers has submitted a very low cost for drilling. The Atomic Energy Commission officials have advised that he is a good driller and has had much experience in the district. It is only for this reason that it has been assumed that he can drill at rates at which he has bid.

It is proposed that if the project is approved that it be set up on the basis of a short form contract. The total price per foot of hole should be 83 cents, of which drilling amounts to 64 cents per foot, and supervision, assaying, and all other expenses amount to 19 cents per foot. The applicant should pay all costs in excess of this amount.

Provision has been made for drilling 197 primary holes 70 feet deep and 132 fill-in holes which will also average 70 feet deep. It is anticipated that these 329 holes will cut 20 feet each of the ore-bearing limestone. Provision has been made for sampling each 2 feet of the limestone. This means 10 samples per hole, or a total of 3,290 samples. Each of these samples should be tested with a Geiger counter. Allowance has been made for assaying 200 samples by chemical methods. The cost of this has been set at $7.50 per sample to allow for assaying, transportation, express, and check sampling by Ledoux & Co., or some very reliable umpire.

It must be the duty of the examining team to make certain that all limestone is sampled and that an adequate number of samples are assayed. The whole purpose of the project is to get assays in order to determine the tonnage and the grade of the ore.

If the applicant did not take all of the samples provided for he could easily save more than his cost of the project. With 20 feet of limestone in each of 329 holes there will be a total of 6,580 feet of limestone. The ordinary drilling of this footage would be at 50 cents per foot, or $3,290. If samples of this footage are recovered the cost will be $1.00 per foot. A total of $1,500 has been allowed for assaying. Since the applicant is being allowed these sums the examining team should use more than ordinary care to make sure that adequate sampling and assaying are done.

Because of the need for uranium for the defense effort and because it is believed that there is a reasonable chance that this project will result in the discovery of uranium ore in economic amounts, it is recommended that an exploration project on the Flat Top-Vilatie Hyde claims be approved on the basis of an expenditure of $19,141.

FLAT TOP-VILAKIN MINE CLAIMS
(RICHARD VERAT, ET. AL.)
MCKINLEY COUNTY, NEW MEXICO
TMSA 2897

URANIUM

Geology

By
Raymond F. Robinson
Geologist, U. S. Geological Survey

FLAT TOP-VILATIE HYDE CLAIMS
(RICHARD VOPAT, ET. AL.)
MCKINLEY COUNTY, NEW MEXICO
NMMA 2897

URANIUM

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INTRODUCTION

The writer visited the Grants, New Mexico area May 5 and 6, 1953, in order to examine the property of Richard Vogat, et. al., designated as the Flat Top-Vilatie Hyde Claims Nos. 1, 2, and 3, for which an application for a DMEA exploration loan has been made. May 5 was spent obtaining information and discussing exploration problems with Mr. Paul Malanson, Chief of the Atomic Energy Office at Grants, New Mexico. Mr. Malanson gave whole-hearted and friendly cooperation and provided pertinent data in the form of maps, drill hole data, and general information on the area. May 6 was spent examining the Vogat property and also several adjoining properties on which mining is being conducted.

Since the Vogat property is completely soil covered, most of the evaluation of the property as a potential uranium-bearing area must be made on the basis of information gained from surrounding operations. The information in this report was obtained largely from Mr. Malanson, publications of the U. S. Geological Survey and the Atomic Energy Commission, from personal observations, and from discussions with Mr. Oscar Manol, Mr. Irving Rapaport, and Mr. William Coffey. The latter are operators of producing mines adjoining the Vogat property.

The Bureau of Mines did not participate in the examination of this property, but an engineering report has been prepared by Mr. M. J. Elsing from information provided by the writer, the doubet, and other engineers.

GENERAL DESCRIPTION

The Vogat, et. al. property is located in the south half of the SE quarter of Section 30, T. 13 N., R. 9 W., McKinley County, New Mexico.

It lies 11 miles north of the San Mateo-Highway 66 junction which is 3 miles west of the AEC office in Grants, New Mexico.

The whole area is readily accessible in dry weather by means of jeep or truck. The conditions of most of the branch roads are subject to weather conditions and are poor to impassable during wet weather. The San Mateo road is a fairly good truck road from the Vogel property to U. S. Highway 66, a paved road. The Anaconda buying station is located about five miles west of the intersection along Highway 66 at Bluewater. The main line of the Atchison-Topeka and Santa Fe railroad parallels Highway 66.

The general area is drained by the San Jose River, a tributary of the Rio Grande, and there are no perennial streams in the area. The water for farming, the principal industry of the area, is obtained largely from wells. The rainfall averages about 14 inches and the country is semi-arid. The days are warm and nights cool. In winter freezing temperatures are reached but the days are pleasant in the river valley.

The vegetation is sparse and consists of sage, grasses, and flowers, juniper, piñon pine, varieties of cacti, greasewood, and some cottonwood. On the high slopes of Mt. Taylor to the east yellow pine, fir, spruce, and aspen are found.

Topographically, the immediate area is predominantly of low relief and lies between 6500 and 7000 feet elevation. Several miles to the east, Mt. Taylor arises about 3000 feet above the river valley, or 11,300 feet above sea level. The San Jose occupies a broad valley incised in soft Triassic shales of the Chinle formation. The south side of the valley abuts against recent volcanic flows. On the north lie a series of low, south-facing

bluffs and mesas. The escarpments are formed by resistant sandstone members and the flat mesas above by soft shales of several formations. The mesas dip gently north and are soil-covered to varying degrees.[1]

The Vogat property is located on one of the flat mesas about a half mile north of the first escarpment to the north of the San Jose River. It is completely soil-covered from depths ranging from 6 to perhaps 75 feet. There are no rock outcrops present on the property. The local relief is very slight, the altitudes ranging from 6,835 on the southwest to 6,800 on the northeast side (see fig. 2).

Ownership

The ownership is mentioned in the engineering report. The claims, Flat Top-Vilatie Hyde Nos. 1, 2, and 3, consist of 2 and 2/3 claims, an area embracing approximately 45 square acres (see fig. 2). The claims were originally owned by Mrs. Vilatie Hyde. Mr. Frank Manel, acting as agent, negotiated the sale of the claims to the Vogat (et. al.) partnership. Mrs. Hyde retained a 5% royalty interest by common agreement and Mr. Manel retained a 10% royalty interest for his part in the transactions. Due to a dispute over actual ownership of the claims early in the transactions, a quiet title suit was necessitated. Mr. Vogat has been asked to submit all pertinent information on this matter. The land here has been withdrawn by the Atomic Energy Commission but the Vogat claims are not affected by this because they existed as valid claims prior to the withdrawal. No gas or oil leases have been taken on this property, according to Mr. Vogat and the Bureau of Land Management. Local ranchers retain grazing rights on all of the area.

1/ Hunt, Chas. B., The Mt. Taylor Dome Field, Pt. 2 of Geology and Fuel Resources of the Southern Part of the San Juan Basin, New Mexico: U.S.G.S. Bull. 860B, 1934-36.

Past Work on Property

There has been no production from mining on the Vogat property. Some bulldozing was done last year for assessment work but the trenches are sloughed in and nothing of value to an examination can be seen. Red rock was reached in some to the southwest at a depth of about 6 to 8 feet. Last year 31 wagon holes were drilled as shown on figure 2 of this report and a map accompanying the engineering section. These holes showed little or no values when probed by the AEC using the regular geiger counter. The AEC office feels, however, that this drilling was not entirely satisfactory and that the proposed exploration work should include some drill holes to check. The wagon drill holes did not have sufficient diameter to permit the use of the scintillometer device now in use in the area.

The writer checked the holes on the Vogat property with a geiger counter against the nearby holes on the Manel property on the west side of Vogat's claims. It was noted that the recordings were at least three times higher at collars of the wagon hole drills on the Vogat claims than those on Manel ground.

GEOLOGY

Stratigraphy

The stratigraphic column for the area about the property is given below. It is taken from RME 6[illegible]2/.

2/ Rapaport, Irving, Hadfield, J. P., Olson, Richard H., Jurassic Rocks of the Zuni Uplift, New Mexico: U. S. Atomic Energy Commission, RME 6[illegible], March, 1952.

Age	Group	Formation	Type	Thickness
Upper Jurassic	Morrison	Brushy Basin*	Mu Sa	0-130
		Westwater Creek	Sa	30-[illegible]
		Recapture Creek	Sa Sts Sh	0-1[illegible]
	San Rafael	Bluff	Sa	280-630
		Summerville	Sa Sts Sh Ls	0-100
		Todilto**	Ls	0-[illegible]
		Entrada	Sa	130-[illegible]
		Carmel	Sts Sa	95-[illegible]
Tower and/or Middle Jurassic	Glen Canyon	Wingate	Sa Sts	0-1[illegible]
Triassic	Chinle		Mu Sh Sa Ls	650±

* Shattuck Bean operation in this horizon.
** Principal producing uranium horizon.

On the Vogel and adjoining properties, the Todilto limestone is the principal uranium-bearing horizon. The local thickness is 12-20 feet. Erosion has removed most of the overlying Summerville on the property except possibly on the northeast corner (where some of it may be left). Figure 2 shows, by means of structural contours along the base of the Todilto, that in this corner the base of the Todilto is over a hundred feet deep. According to drill hole data, as much as 8 feet of the Todilto may have been removed by erosion on the southwest corner of the property. Since the formational dip is to the northeast, full thickness of the formation may be expected over much of the property. This cannot be ascertained at present because, as mentioned previously, the claims are completely soil-covered to a depth of 6 to 75 feet.

The Todilto formation may be conveniently subdivided into lower and upper sections on a lithologic basis. The upper portion is a dark-grey, dense, thinly-bedded limestone. The beds are well marked and show considerable crinkling and crenulation. It has undergone recrystallization. The lower portion is dark grey, dense, thick-bedded, lithographic textured limestone and near the base it contains interfingering lenses or beds of

calcareous silty sandstone. The formation as a whole is unfossiliferous and is said to have a petroliferous odor on fresh fractures.

According to RMO 64B[3] the Entrada sandstone underlays the Todilto limestone conformably. The Entrada is said to be largely eolian in origin and the Todilto formed in a lacustrine basin. The Summerville overlies the Todilto conformably and in turn is overlain in the same way by the Bluff. The latter two formations are though to be fresh-water stream deposits on flat-lying planes.

The Summerville and Bluff have been completely removed by erosion from the Vogat property.

The Morrison group overlays the lower formations conformably. It is considered to be fresh-water deposits on flat-lying flood planes by streams which deposited chiefly during flood times. They contain much organic matter in the form of vegetation and dinosaur remains. In the Grants area the Brushy Basin and West-water members contain carnotite-like deposits associated with organic remains. (Shattuck Dam operation is in Brushy Basin). These have been removed by erosion from the Vogat property.

Structure

The uranium producing area near Grants lies on the north flank of the Zuni Uplift, believed to be of early Tertiary age. The McCarty syncline lies north and east of the area. It appears that this uplift has been particularly instrumental in the structural deformation of the Grants area and produced conditions which led to the localization of uranium ore bodies.

The Zuni Uplift is a broad asymmetrical dome about 65 miles long, elongated in a northwest direction, and about forty miles wide. The southwest portion has strata dipping south up to 80 degrees, while on the north flank, the strata are gently dipping northward. Structural relief is estimated to

3/ Op. cit.

be 6,600 feet and a Pre-Cambrian crystalline core is exposed on the highest parts of the dome.

The McCarty syncline has been structurally depressed about 1500 feet below the mass of Mt. Taylor volcanics. Dikes which cut through the Grants uranium-bearing area are thought to be related in origin with this mass.

Folding

Several broad folds on the north flank of the uplift are believed to have formed with it. The Vogel and adjoining properties lie on the northwest flank of a broad gentle syncline which strikes about north 50° east and is followed by the San Mateo road for some distance. The axis of this fold is marked by a paralleling fault showing a displacement of about 275 feet. The east side is the down-dropped block (see fig. 1).

Minor small-scale folding is present in the uranium-bearing areas and was especially instrumental in localizing the known ore deposits in the Todilto limestone. The folds range from a few inches to a few feet in amplitude. Early work done indicated that they were slumpage folds formed during deposition and prior to lithification. Recent work[4/,5/] has shown that the folds form a right angle conjugate pattern which is definitely in alignment with the trends of the major Zuni Uplift structures. In addition to the Todilto, the top of the Entrada and the base of the Summerville formations have been involved in the folding. It is now believed that the folding was caused by the response of the relatively incompetent Todilto to sliggage between the competent Summerville and Entrada formations during the Zuni Uplift.

4/ Gilbey, Arthur K., Fracture Pattern of the Zuni Uplift, Second Progress Report: U. S. Atomic Energy Commission, RMO 897, November, 1952.

5/ Op. cit.

Faulting

Contemporaneity of faulting and folding is shown by the fact that one is observed to pass into the other along the strike so that both are probably related to the major uplift. The faulting also has a right angle conjugate pattern similar to the folding and the pattern suggests that they are tensional breaks in response to vertical forces during the Zuni Uplift.

There is very little faulting in the immediate area of the Vogel property. However, to the northeast in the vicinity of the common corner of sections 23 and 25 a considerable amount of faulting, with minor displacement, has taken place (see fig. 1). The distribution of the ore bodies and the faulting as shown do not necessarily indicate a close association of the two.

Jointing

Jointing exhibits patterns similar to folding and faulting, and all indications are that they have originated from common causes. Jointing is partly responsible for localization of the ore shoots.

Mineralization

The ore minerals present in the deposits in the Todilto are chiefly tyuyamunite, pitchblende, carnotite, and uranophane. Fluorite, barite, pyrite, hematite, and limonite are also present in varying amounts.6/ Red alteration halos are noted about dark black pods of pitchblende(personal observation).

ORE RESERVES

A satisfactory examination of the property cannot be made because of complete soil cover. In order to evaluate the geologic possibilities for ore occurrence here, attention must be turned to information which has

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6/ Rapaport, Irving, Interim Report on the Ore Deposits of the Grants District, New Mexico: U. S. Atomic Energy Commission, RME 1031, November, 1952.

been obtained from results of exploration in adjoining areas, especially on the west and south. No work has been done east of Vogel's claims. Geologic mapping, drilling, radioactive logging of drill holes and mining has developed what appears to be a trend of the mineralization in this area. Figure 1 shows the trend of the belt, which appears to be favorable for ore occurrence in the areas which have been drilled out to date. This belt is defined in only a general way by connecting the outside boundaries of the known ore bodies within the explored areas. Figure 2 shows the picture close to the Vogel claims on a larger scale as the adjoining properties of the Santa Fe on the south and the Oscar Mund property on the west. It is very suggestive that the Vogel claims lie well within the probable extension of the belt, as defined; thus, the geologic indications may be said to be favorable and a reasonably good chance exists that ore will be found on the property.

Elsewhere in the area definite ore controls have been established which are present in almost all the deposits now being worked. The crests and flanks of small anticlinal flexures are especially favored placed for localization of uranium ore shoots. The reason for this may be that these areas are most permeable due to fracturing and recrystallization due to folding. They may also actually have acted as structural traps for solutions circulating within the formation. The upper thin-bedded formation is said to have larger and richer ore shoots than the lower massive section, which may be explained in the light of relative permeability. The deposits are also said to be largely fillings in joints and fractures with very little replacement and dissemination within the rock itself.1/

1/ Unpublished data, Atomic Energy Commission Office, Grants, New Mexico.

Unfortunately, the folds are so small that they cannot be traced laterally or vertically far enough to be of value in locating ore shoots where cover of younger formations is thick or extensive. However, once the ore has been found, these controls help simplify the extraction and planning of mining operations.

Fortunately, it was possible to check the various geologic aspects in the open pit mine of Gaspar Manal on the west side of the Vegat claims. This pit is shown on figure 2 and lies only 2000 feet west of the west side line of the Vegat claims. The showings were very much as described in the literature in the various AEC publications. However, while a great deal of the ore does occur as fracture and joint fillings by tyuyamunite, uranophane, etc., very definite examples of disseminated ore were found in the more massive and thicker beds. A great many pods and fine-grained dense black material (which showed very high reactions approximating 5 to 10% U_3O_8) were found; these are apparently pitchblende. They appear most abundantly in and along bedding planes. These showed various degrees of alteration to the yellow and orange uranium oxide minerals, so that both primary and secondary disseminationed ore occurrences are actually present. According to Manal (personal communication) the black mineral is the material "which really raises the grade of the ore." It was also noted that this material is accompanied by red halos, which should serve as additional guides for identification of this "high grade. It would seem most likely that the high grade occurrences are hydrothermal replacements and that most of the other secondary minerals have been derived from them.

The irregularity of the distribution of the ore shoots and the small size of their occurrences are indicated on figures 1 and 2. Quite a large number of deposits have been found in the northwest portion of the

belt where faulting is most abundant, but just as many occur along the belt of mineralization where there is no appreciable faulting recorded. Enough evidence to fully explain the distributions has not yet been assembled.

The bodies which have been found and may yet be expected to be found are very small. They range from those containing a few hundred tons to those which may contain a few thousand. To date only about 100,000 tons of ore has been shipped from this Grants area. Production on the property west of the Vogel claims has been exceptionally good. Three thousand tons have been shipped from here to date, which probably averaged about .25% U_3O_8. Most of this has come from the larger pit shown on figure 2. The cut-off grade for mining here is not a static figure and is dependent upon the factor of depth of rock or soil cover - whether the ore body can be mined by open pit or underground methods. It is also dependent upon the indicated tonnage. To date almost all production has come from relatively cheap open-pit mining - no "particular" cut-off grade has been established for underground mining to date here.

METHODS OF EXPLORATION

The nature of these occurrences of uranium - relatively shallow-seated, rich, small and irregularly spaced sheets or bodies - requires that the areas to be explored must be drilled very closely. To date the standard pattern developed as the most reliable method is drilling on a grid pattern with 100 feet centers. Within this pattern it is safe to assume that no significant ore body will be entirely missed. "Fill in" holes are then needed to close in around anomalous primary grid holes in order to delimit the ore occurrence. Fortunately, most of the area under exploration (to date) has very shallow or no covering on the favorable horizon and drilling can be

done relatively cheaply at 50¢ / foot. Eventually the Todilto area, under the cover of younger formations of the Morrison group, will be considered for exploration and drilling will be vastly more expensive.

Method of Sampling

At the present time no sampling is being done on the holes being drilled for exploration work in the area. The operators are entirely dependent upon the AEC logging device, based upon the use of the scintillometer for determining what constitutes ore or where the cut-off occurs. Several operators in the area were consulted and they expressed the opinion that the logging device was far better than sampling core or blowing out the cuttings for sample and assay from a hole at various intervals. They believe it to be more accurate and dependable by far. It appears that this instrument is a fine and indispensable guide for uranium production in the area. The principal question which arises now is whether or not the field team will accept this method as a substitute for sampling and chemical assaying in the contract. Since the operator must, in his final report, provide an estimate of ore reserves - tonnage and grade - he will have to have one of the two methods to guide him. If the AEC logging method can be used, it will eliminate half the cost of class two (fill-in) holes, sampling and assaying, which represents between five and six thousand dollars.

The AEC field men have been instructed not to take responsibility for calculating tonnage and grade with the logging device. However, it was intimated that it could be done at least to a reasonable degree of accuracy by calibration. Several operators stated that it could be done to the satisfaction of practical operation. It is felt that this is a technical matter to be solved by the field team and the AEC, but it is believed that

acceptance of the logging method over the more expensive sampling of the drill holes and chemical assaying should be made if it is feasible to do so.

CONCLUSIONS

The Vogat property is entirely covered by soil and no outcrops are visible. Therefore, the property must be evaluated in the light of information from the adjacent operating and previously explored properties.

There is a reasonably good chance to find uranium ore bodies of economic proportions on the Vogat property. This conclusion is based upon reliable information from the nearby mining operations and from the Atomic Energy Commission personnel. The property lies well within the projected boundaries of what appears to be a favorable zone for the localization of uranium mineralization. The boundaries of this zone are generally defined by the results of exploratory drilling and mining on the west and south sides of the Vogat property.

The ore will be contained within the Todilto formation of Jurassic age, which is principally a limestone. It varies from 8 to 20 feet in thickness and the ore may occur at any horizon within it.

The ore bodies which may be found will occur from 6 to perhaps 75 feet beneath the surface. They will very likely be small, and the production from them will probably range from a few hundred to a few thousand tons of ore. The average grade will approximate .25% U_3O_8; this is the average of 3000 tons of ore produced from an adjoining property on the west. The economic limits of mining will be defined largely by the depth of the bodies from the surface.

The occurrence of the ore is governed by small geologic structures such as folds and jointing which are not persistent laterally or vertically for appreciable distances and have no predictable trend. They are not good

guides for exploration, particularly in the case of the Vogel property, but they are very helpful in the mining operations as guides in following the ore.

Because of the small size and erratic distribution of the ore bodies which can be expected, and the lack of structural controls which can be utilized in exploration planning, it is necessary and standard practice to drill areas on grid patterns with 100 foot centers. Additional drilling be done in an ore bearing grid holes is necessitated to delimit an ore body.

If the field team will accept the use of the scintillometer logging device to determine tonnage and grade in this particular program in place of sampling and chemical assaying, several thousand dollars can be saved.

DMEA-2897, FLAT TOP-VILATIE HYDE URANIUM CLAIMS
McKINLAY COUNTY, NEW MEXICO

Engineering Report

By A. J. Klaing
Consulting Mining Engineer
U. S. Bureau of Mines

June 1953

DMEA-2897, FLAT TOP-VILLETTE MESA URANIUM CLAIMS
McKINLEY COUNTY, NEW MEXICO

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INTRODUCTION

On February 17, 1953, the Field Team, Region IV, of the Defense Minerals Exploration Administration requested that an examination and report be made on the feasibility of Government assistance in the amount of $19,141 for the exploration for uranium on the Flat Top-Vilatie Hyde claims, McKinley County, N. Mex. The application was made by Richard Vopat (a partnership). The project has been given Docket No. DMEA-2897 (Uranium).

On June 2, 1953, M. J. Elsing and J. H. Haynes of the U. S. Bureau of Mines in company with Paul R. Melancon of the Atomic Energy Commission at Grants visited the property.

LOCATION

The property includes 2-2/3 claims covering 46.67 acres and is located in the south half of the southeast quarter of Sec. 30, T. 13 N., R. 9 W., McKinley County, N. Mex. (see figure 1).

The property is approximately 14 miles northwest of Grants, N. Mex., which will be the supply center and living quarters for men employed at the project.

The property is reached from the Atomic Energy Commission office in Grants by travelling west on U. S. Highway 66 for 3.2 miles. At that point State Highway 53 (San Mateo road) is followed to the north for 11.1 miles where a turn is made to the west passing through a gate near which the property is entered.

From the property it is approximately 16 miles to the Anaconda Copper Co.'s buying station situated at Blue Water, N. Mex.

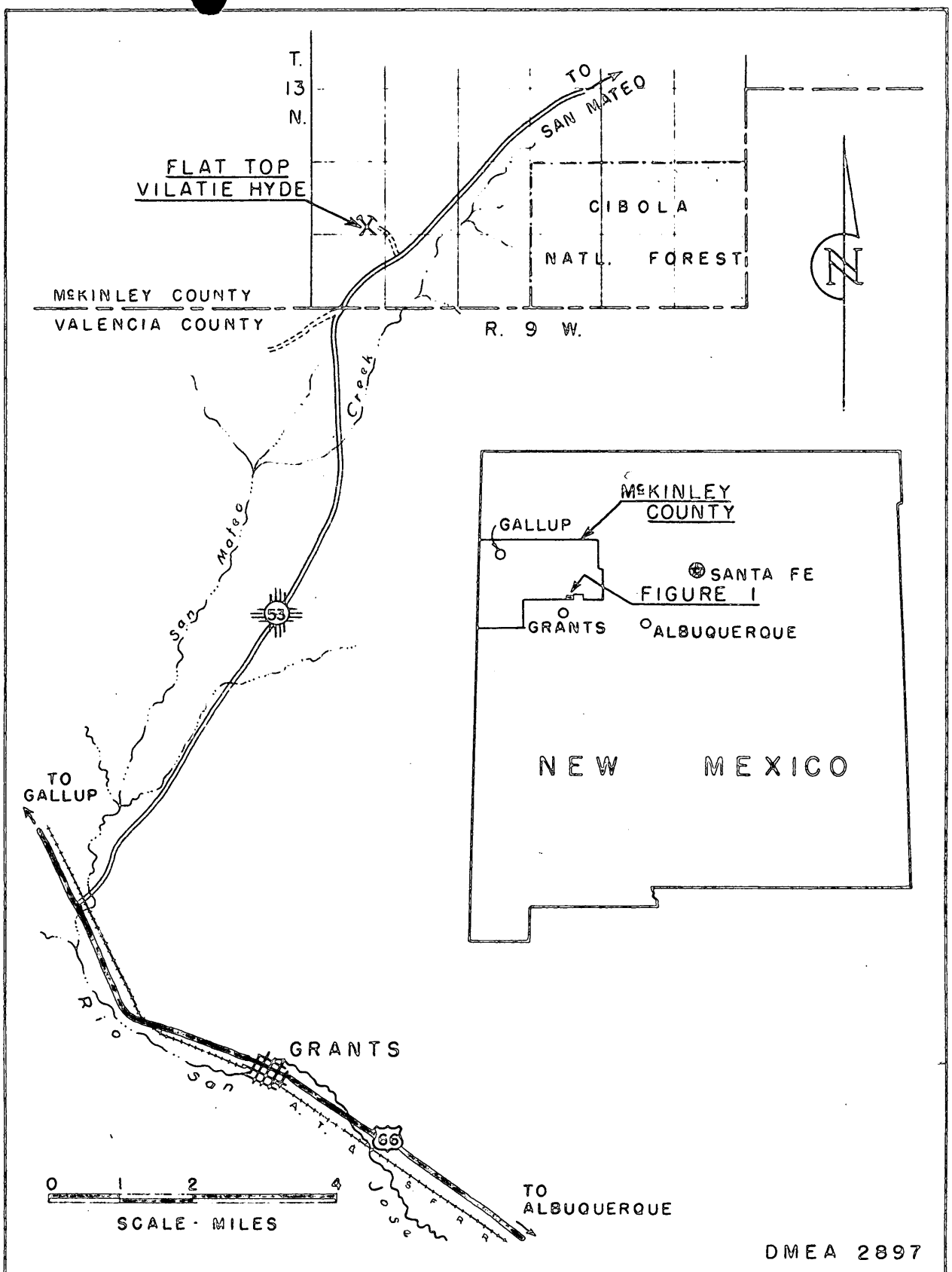

FIGURE 1. - LOCATION MAP - RICHARD VOPAT
FLAT TOP - VILATIE HYDE CLAIMS MCKINLEY COUNTY, NEW MEXICO

OWNERSHIP AND EXTENT

The property comprises 3 unpatented mining claims known as FlatTop-Vilatie Hyde Nos. 1 to 3, inclusive, the titles to which are recorded in the County Recorder's Office at Gallup, N. Mex., the county seat of McKinley County, in the book of Miscellaneous Records and at the page number shown below:

Claim	Book	Page
Flat Top-Vilatie Hyde #1	10	287
Flat Top-Vilatie Hyde #2	10	288
Flat Top-Vilatie Hyde #3	10	288

The property is owned by a partnership including:

Richard Vopat, 601 Court St., Scott City, Kansas;
Howard T. Young, 911 Church St., Scott City, Kansas;
Dr. R. M. Spencer, 606 Russell St., Scott City, Kansas;
Fred W. Heine, Lucas, Kansas;
Robert R. McNeely, 337 So. Terrace Dr., Wichita, Kansas.

The original owner of these claims was Mrs. Vilatie Hyde, Blue Water, N. Mex. Mrs. Hyde has retained a perpetual 5 percent royalty interest in production, and Frank Manel, Aztec, N. Mex., has a perpetual 10 percent royalty interest by virtue of turning the property from Mrs. Hyde to the partnership.

The area in which the Flat Top-Vilatie Hyde claims are located has been withdrawn from mineral entry for the Atomic Energy Commission. However, these claims were located prior to this withdrawal. Vopat stated that in order to establish title to these claims, suit to quiet title was brought and the title was established beyond any question.

In order to establish ownership of these claims Vopat submitted information which shows the more important links in the chain of title as follows:

(1) Original location notices filed December 11, 1950 and followed by amended locations;

(2) As part of an escrow agreement, Mrs. Vilatie Hyde and Arthur W. Hyde on December 17, 1951 filed a warranty deed in favor of Frank O. Manel and Hazel I. Manel;

(3) On January 10, 1952, the Manels gave a quit claimdeed to Richard Vopat for a 1/5 interest in the property.

Vopat stated that the Quiet Title action was the result of differences between the Hydes and the Manels and that their differences were compromised by providing the already mentioned royalty payments.

Paul Malmsten, representative of the Atomic Energy Commission at Grants, advised the examiner that the location of the claims was prior to the land withdrawal order, and therefore valid.

The power of attorney authorizing Vopat to negotiate an exploration contract with the Defense Minerals Exploration Administration, signed May 11, 1953 by Heine, Young, Spencer, and McNeely has been attached to the docket, along with a copy of the quit claim deed to 1/5 of the property from the Manels to Vopat, dated January 19, 1953. This deed was recorded February 5, 1952 in the office of the Clerk of McKinley County in Book 6 of Q. C. Deeds, page 438.

The Manels are reported to have executed four similar quit claim deeds to a 1/5 interest in the property to Heine, Young, Spencer, and McNealy. Copies of these deeds were not seen but it seems reasonable to assume that they exist as Heine, Young, Spencer, and McNally would not have given a power of attorney to Vepat if this were not the case.

PROJECT PROPOSALS

The Flat Top-Vilatie Hyde claims No. 1 to No. 3, inclusive, are to be explored by drilling on a grid pattern with holes at 100-foot intervals. Having found ore in any hole it is proposed to drill 4 fill-in holes at 10- to 25-foot intervals in 4 directions from the primary discovery hole (see figure 2).

The area to be drilled is 1,300 by 1,550 feet. The southwest corner of this area, comprising a section approximately 300 feet by 600 feet, already has been incompletely and unsatisfactorily drilled by the applicant, using a wagon drill. The diameter of these holes was too small to be probed with the Atomic Energy Commission's scintillometer and their position does not conform to a general grid pattern as now planned. It is proposed to drill 8 holes in the area drilled by Vepat. The balance of the area will require 189 holes. Therefore, the total number of primary holes will be 197.

The depth of these holes will vary from 16 to 100 feet with an average estimated depth of 70 feet. The past history of drilling in the area adjoining this property indicates that one-sixth of the holes to be drilled will encounter mineralization of sufficient interest

to warrant drilling the 4 fill-in holes surrounding the original hole. On this basis it is estimated that 132 fill-in holes will be drilled, each of which will average 70 feet in depth.

W. T. Myers of the W. T. Myers Drilling Co. of Lovington, N. Mex., has submitted the following bid on the drilling:

"Mr. Richard Vopat
Scott City, Kansas

"Dear Mr. Vopat:

"The following bid is submitted on your project located in the SW ¼, SE ¼, of Section 30, T. 3 N., R. 9 W., Valencia County, Grants, New Mexico:

Class 1 drilling: Plain hole, no casing.

1st 100 feet or any part thereof	$ .50 per foot
2nd 100 feet or any part thereof	1.00 per foot
3rd 100 feet or any part thereof	1.50 per foot
4th 100 feet or any part thereof	2.00 per foot
5th 100 feet or any part thereof	2.50 per foot

Class 2 drilling: Hole as above but blown clean of cutting every two feet.

1st 100 feet or any part thereof	$1.00 per foot
2nd 100 feet or any part thereof	1.50 per foot
3rd 100 feet or any part thereof	2.00 per foot
4th 100 feet or any part thereof	2.50 per foot
5th 100 feet or any part thereof	3.00 per foot

Class 3 drilling: Coring in formations amenable to coring.

1st 100 feet or any part thereof	$3.00 per foot
2nd 100 feet or any part thereof	3.50 per foot
3rd 100 feet or any part thereof	4.00 per foot
4th 100 feet or any part thereof	4.50 per foot
5th 100 feet or any part thereof	5.00 per foot

"Cementing holes and drilling cement plug in fractures and cavities where practical, $3.00 per foot in any depth zone. Standby time $9.00 per hour for delays at your request and account. In the event of such fractures, watercourses, and cavities which make it necessary or advisable to skid our rig, we are to be paid for footage drilled to such a point.

"All three classes of drilling may be combined in any hole in any proportion. We also want to call to your attention that a 500 feet plain hole will average only $1.50 per foot at the above rates. Shorter holes will be proportionately lower.

"The above prices cover all costs of equipment, labor, tools, supplies, materials, payroll taxes, and insurances.

W. T. Myers Drilling Company

By /s/ W. T. Myers
W. T. Myers"

The proposed project can be broken down into 3 parts as follows:

Part I will include drilling the 197 primary exploration holes, the average depth of which will be 70 feet. A total of 13,790 feet of drilling will be done at an average contract price of $0.64 per foot, or a total of $8,826 (50 ft. @ $0.50 and 20 ft. @ $1.00 for each hole).

Part 2 will include drilling 132 fill-in holes, the average depth of which will be 70 feet.

It is known that ore, if present, will be found in a bed of limestone which averages about 20 feet in thickness. The past record of drilling in the district also shows that the ore in any one hole may have a total thickness of approximately 5 feet and may consist of one or more mineralized beds in the limestone. The elevation of the ore horizon in the primary holes will be located by a scintillometer and the fill-in holes will be drilled on the basis of this information. The first 50 feet of hole will be drilled under Class 1 of the drilling contract at a cost of $0.50 per foot, and 20 feet under Class 2 at $1.00 per foot. Class 2 drilling provides for blowing the hole clean of cuttings every 2 feet. There will be 10 samples for each hole. The 132 fill-in holes will cost $45 each (50 feet @ $0.50 and 20 feet @ $1.00), or a total of $5,940.

Part 3 of the project provides for chemical assaying. As soon as a hole enters the limestone the drill cuttings will be blown from the hole at each 2-foot interval and caught in a collector. On the assumption that the limestone ore horizon is 20 feet thick, there will be 10 samples for each hole. A Geiger counter will be used to determine which of these 10 samples should be assayed chemically. Since the average thickness of the ore is approximately 5 feet, not more than 3 2-foot samples will need to be assayed and if necessary two could be combined for one assay. Assaying usually costs $5.00 per sample. With transportation and the cost of sacks the cost per sample is estimated at $7.50.

A total of $1,500 has been set up for assaying. This provides for 200 samples at $7.50 each. This should cover transportation including express, chemical assaying, sample sacks, and some check assaying by Ledoux & Co. or some other very reliable umpire.

Part 4 includes supervision, engineering, and miscellaneous expenses, and Part 5 includes items considered to be capital equipment but not paid for under the contract.

TIME SCHEDULE

The contractor has estimated that the maximum drilling footage will be 400 feet per shift and that the average will be 300 feet per shift. Work probably will be done on a 6-day week and confined to the day shift only. The total footage of primary holes is 13,790 feet, and with drilling at the rate of 300 feet per shift, the drilling time will be 7.7 weeks.

There are 9,240 feet of fill-in holes, the drilling of which will be at the rate of approximately 200 feet per shift. The time required for drilling these holes will be 5.2 weeks, or for all drilling the overall time required will be about 3.0 months. Costs are set up on the basis of one half month to prepare for drilling and one half month after drilling to complete assaying and make the final report on the project. This is a total of 4.0 months.

PERSONNEL AND DUTIES

Practically all work at the property will be done by a contract driller but there will have to be a supervisor and a part time engineer. Both are readily available. Richard Vogel, a partner in the project, will be the supervisor. He has suggested that he be employed at a daily rate but it is preferable that he work on a monthly salary basis. His duties would be to help the engineer lay out and stake each hole to be drilled, measure and keep a record of the footage of each hole drilled, and see that the contractor keeps daily log records of drilling which the supervisor should file for future reference. He should observe the taking of samples, properly number and describe each, test each sample with a Geiger counter and send high-grade samples to an assayer for the determination of uranium by a chemical process. He should keep charts, maps, and all necessary data, including the location of each sample, its assay grade, location in the hole, and the footage extent of the sample. The method of keeping these records should be set up by the applicant's engineer and the Government's examining engineer should be advised of the records to be kept.

The supervisor should keep all books, accounts and monthly reports in connection with the project and pay all bills.

At the end of the project, the supervisor with the engineer should make a final report on the project.

There is nothing difficult about the duties to be performed but it is a full time job and the supervisor should be expected to be at the property during the entire time that drilling is being done.

The services of an employed engineer living at Grants, N. Mex. are available on Saturdays and Sundays, and possibly other days or parts of days during the week.

The engineer's duties would be as follows:

Lay out and stake all holes to be drilled with the help of the supervisor. This should not require more than a maximum of 3 days. When sampling starts the engineer should be allowed one day to observe and approve the method of sampling and devise a system of keeping sample records in a notebook and on sample maps.

Upon completion of the project the engineer should assist the supervisor in preparing a final report on the project. His particular duties would be to prepare assay maps and ore reserve calculations and other engineering data relative to the project. Three days should be ample to permit this.

Since the supervisor has had no engineering experience it would be advisable to make the engineer available for consultative advice by phone or in person. A total of five days has been allowed for this.

A total of 12 days has been allowed in the project for engineering as shown above.

It is suggested that the pay for the engineer be $27.50 per day, including transportation to and from the mine.

ESTIMATED COSTS OF PROJECT

The following is a summary of the estimate of costs:

Contract drilling		
Primary holes, 13,790 feet @ 64¢ (50 ft. each hole at 30¢; 20 ft. @ $1.00)	$8,826	
Fill-in holes, 9,240 ft. @ 64¢	5,914	
Total, 23,030 feet @ 64¢		$14,740
Assaying, including transportation		
200 samples @ $7.50		1,500
Supervisor		
4 months @ $500, plus 11% for insurance, taxes, etc. (See breakdown which follows)		2,220
Engineering		
12 days @ $27.50, plus 11% for insurance, taxes, etc. (See breakdown which follows)		366
Other Expenses		
Stationery, postage, typing $75; Miscellaneous 100		175
Filling Holes		130
Capital Equipment (not allowed)		
Geiger counter and sample splitter		None
Miscellaneous above		$4,411
Drilling by contract		14,740
Total cost of project		$19,141

On this basis the actual cost of drilling will be 64 cents per foot and the incidental and other expenses including supervision and assaying will be 19 cents per foot making a total of 83 cents per foot, which is the price suggested for a short term contract.

Breakdown of Salaries

This figure is an estimated average and may be different for different companies and different individuals. In this estimate the following factors have been used which are as accurate as can be obtained.

Supervisor	Per Month
Salary	$500.00
Old Age Benefits, 1.5% (up to $3,600)	7.50
Federal Unemployment Ins., 0.3%	1.50
N. Mex. Unemployment Ins., 2.7% (up to $3,600; 0.3% thereafter)	13.50
N. Mex. School Tax, approx. 1%	5.00
Workmens Compensation Insurance, Incl. Occupational Diseases varies from 3.984% to 6.1%, estimated at 5.5%	27.50
per month	$ 555.00
4 months	$2,220.00

Engineer	12 days
Salary, 12 days at $27.50	$ 330.00
Old Age Benefits, 1.5%	4.95
Federal Unemployment Ins., 0.3%	.99
N. Mex. Unemployment Ins., 2.7%	8.91
N. Mex. School Tax, approx. 1%	3.30
Workmens Compensation Ins. (estimated at 5.5%)	18.15
Total	$366.30

It is believed that the applicant's salary cannot be materially reduced as his living expenses in Grants will be high and he will have an auto expense of approximately $1.50 per day, or $45 per month which his salary is supposed to include.

OPERATIONAL PROCEDURE

Operational procedure can be outlined only tentatively and should be varied to meet conditions. The schedule of work can be forecast approximately as follows:

(1) The supervisor and engineer will lay out and stake all primary holes;

(2) Myers will start drilling primary holes. It is understood that the Grants office of A.E.C. will probe all primary holes with a scintillometer and will report findings a s drilling progresses. It is believed that as soon as one of the primary holes shows ore of importance that the applicant should be allowed to start drilling the fill-in holes but only after such drilling has been recommended by the A.E.C. engineer and approved by the DMEA engineers.

The distance of the fill-in hole from the primary hole should be recommended by the A.E.C. and approved by the DMEA examiners.

The object of allowing the drilling of fill-in holes before completion of the primary drilling is to obtain as much information as possible as drilling progresses and if possible to find an ore body which could be mined even before the completion of the entire program.

(3) Upon the discovery of ore in a hole the supervisor should, with the advice of the engineer, approve the sampling method and see that samples are taken, identified with tags, tested with a Geiger counter and if necessary have the sample assayed chemically.

(4) Upon completion of a hole it should be covered with a flat rock and its location should be indicated by a stake. This should be the obligation of the driller.

(5) It should be the duty of the supervisor to prepare his reports at the end of the month showing costs and particularly the footage of Class No. 1 holes drilled and Class No. 2 holes.

PROPOSED FINANCING

The project as set up provides for the expenditure of $19,141 of which the applicant proposes to furnish one-tenth or $1,914 and requests that the Government provide $17,227.

CONCLUSIONS

On the basis of the findings on ground developed by Mancl to the west and on discoveries on the Santa Fe Railroad ground immediately to the south, it seems that the Flat Top-Vilatie Hyde claims should be equally productive and that the ore bodies will be of more or less the same size and grade. The ore bodies in the district have been small and high grade which accounts for the close spacing of the primary drilling as well as the fill-in drilling. The whole project has been set up upon the generally accepted practise in the district which has the approval of the local A.E.C. officials.

In a letter dated March 3, 1953, from Paul L. Melancon, District Geologist, Atomic Energy Commission, Grants, N. Mex., to A. F. Shride, Acting District Supervisor, Arizona-New Mexico, U. S. Geological Survey, Tucson, Ariz., Melancon stated:

"In regard to your letter of February 26, 1953 regarding the request for a RFC loan on the Vilatie Hyde claims on sec. 30, T. 13 N., R. 9 W., McKinley County, New Mexico, the property is definitely worth considering for a loan.

"The property is located near a deposit which produced over $60,000 worth of ore in less than three months, and the northern part of the area may be along what appears to be a mineralized trend in which a large tonnage was developed by the Santa Fe Railway in the adjacent section to the west.

"The drilling pattern suggested by the applicants is normal for exploration in the limestone, and it has been used extensively and fairly successfully by both Anaconda and the Santa Fe."

Myers has submitted an extremely low bid for drilling and were it not for the fact that he has been operating for some time in the area and officials of the Atomic Energy Commission have recommended him as a competent driller, his cost estimate of drilling would be accepted with some doubt.

Should drilling of the primary holes listed as Part 1 of the project be unfavorable, it is conceivable that the project should be stopped even before the completion of these holes. For example, if 75 to 100 of the primary holes on 100-foot coordinates were barren it would be advisable to continue drilling at 200-foot coordinates. If these were barren it would be best to stop the project.

The project requires close watching. In a sense it is pioneering because the project differs from the Manal operation in that the Manal deposits either outcrop or are covered by only a few feet of overburden.

In the case of the Vilatie Hyde claims there may be as much as 60 to 70 feet of overburden. To remove 30 or 35 feet of overburden would not be too serious but if the overburden is 60 to 70 feet with a small ore body, waste removal becomes serious because of the excessive amount of material that has to be removed due to the flat slopes of an open pit in soft sandy material.

The grade of the ore at the Manel property is 0.25 percent U_3O_8. The costs and profits are unknown. It is certain that on Vilatie Hyde ground if the grade is 0.25 percent the costs will be higher and the profits will be less. As the depth of overburden increases the vanishing point of profits will be reached. This depth is unknown and there are insufficient data to calculate it. There are many unknown variables and an estimate of costs would be only a guess. As an exploration project especially for uranium, these data are not too important. The main consideration is to find uranium ore of somewhere near a profitable grade. On the other hand this does not warrant continuing drilling beyond the point where it is reasonably certain that substantial amounts of ore will not be found.

RECOMMENDATIONS

Because of the discovery and production of uranium ore from the areas immediately to the west and to the south of the Flat-Top Vilatie Hyde claims, and because the geological and structural conditions are almost identical to these areas, it is recommended that the project of Richard Vopat for the exploration of these claims be approved on the basis of a total expenditure of $19,141.

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 31 1953

224 New Customhouse
Denver 2, Colorado

August 26, 1953

Mr. Richard Vopat
601 Court Street
Scott City, Kansas

Re: Docket No. DMEA 2897

Dear Mr. Vopat:

We have had no reply to our letter of July 8, 1953 requesting the following information:

(1) signed copies of your partnership agreement and the Hyde-Manol agreement.

(2) a list of the names and addresses of all your partners.

(3) the ownership of the claims as tenants in common, or as partners.

(4) Are Hyde and Manol included in your partnership?

We also enclosed six copies of Form MF-203, Owner's Consent to Lien, and these have not been returned to this office. We, therefore, presume that you are no longer interested in this exploration project, and are placing your application in our inactive file.

Very truly yours,

W. H. King

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

HMC:es

cc: Docket
Mittendorf ✓
Chron.
Storms
Koschmann (2)
Connors

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

224 New Customhouse
Denver 2, Colorado

August 27, 1953.

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 200

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2897 (Uranium), Flat Top-Vilatie Hyde Claims, McKinley County, New Mexico.

Enclosed are four copies of the final report on the subject docket. The Field Team recommended drilling in the amount of $4,531.80 but the applicant failed to furnish necessary information for the preparation of a contract. The application has been placed in our inactive file.

Two copies of Form 3b are attached.

W. H. King

A. H. Koschmann

Enclosures

Withdrawn

WITHDRAWN

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

August 27, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2897 (Uranium), Flat Top-Vilatie Hyde Uranium Claims, McKinley County, New Mexico.

Enclosed are eleven copies of the final engineering report on the subject docket.

The applicant requested $19,000.00 to wagon drill 189 holes on a 100 foot grid pattern. The engineer examiner recommended the same amount of drilling.

The Field Team considered this amount of drilling to be excessive and asked R. F. Fischer for his comments and he concurred with the Field Team in recommending the drilling of forty-six primary holes.

The applicant has failed to furnish information necessary for the preparation of the contract and the application has been placed in the inactive file.

W. H. King
W. H. King

Enclosures

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O. Box 360
Grand Junction, Colorado

August 18, 1953

Memorandum

To: W. H. King
A. H. Koschmann A.H.K.

From: R. P. Fischer

Subject: Comments regarding DMEA 2897

The report on the field examination, DMEA 2897, Flat Top-Vilatie Hyde claims, McKinley County, New Mexico, and a modified recommendation by the field team was sent to this office for review. I referred the problem to J. D. Strobell, USGS geologist, who is familiar with the area. His comments are incorporated in a memorandum to me, four copies of which are attached.

Strobell believes the area of the applicant's claims to be favorable for finding uranium ore, and that the modified plan of exploration suggested by the field team is sound, provided arrangements are made to obtain radiometric logs of the wide-spaced drill holes. Strobell points out, however, certain mining problems in the area of these claims, and questions whether the expected amount of ore that might be found will be enough to repay the DMEA loan.

I believe Strobell's statement presents the problem clearly and gives enough information to permit the preparation of an exploration contract if the application is approved.

Returned herewith are the original copies of the Geological Survey and the Bureau of Mines final reports on the subject docket, together with a copy of the brochure. Also returned herewith are two copies of figure 2--one showing the drill holes recommended by the field examiners, and the other showing the modified pattern recommended by the field team.

RPF

R. P. Fischer
Acting District Supervisor
Colorado Plateau District

Enclosures

cc: King and Koschmann (3)

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

August 18, 1953

Memorandum

To: R. P. Fischer, Acting District Supervisor

From: J. D. Strobell, Jr., Geologist

Subject: Flat Top-Vilatie Hyde claims, McKinley County, New Mexico, DMEA 2897 (Uranium)

Application was made by Richard Vopat for federal assistance in exploring the three Flat Top-Vilatie Hyde claims in sec. 30, T. 13 N., R. 9 W., McKinley County, New Mexico. The applicant proposed to spend $19,000. The property has been examined by the Bureau of Mines and Geological Survey. Their reports and a suggestion by the Field Team have been referred to the Colorado Plateau District office for comment.

I have ~~received~~ reviewed the applicant's proposal and the examiners' recommendations, and have myself been on the property (June 2, 1953, and August 11, 1953) in connection with examination of the adjacent F. O. Manol property. Through Mr. P. E. Melancon, District Geologist of the U. S. Atomic Energy Commission at Grants, New Mexico, much pertinent information about exploration and development in the vicinity of the Flat Top-Vilatie Hyde claims was made available.

The applicant proposed to drill the property on 100-foot centers and to offset favorable holes at distances of 10 to 25 feet. The examiners allowed 197 primary holes spaced 100 feet apart and 132 closer spaced offset holes. The Field Team suggests that the primary holes be spaced 200 feet apart in a staggered pattern having alternate rows offset 100 feet; this suggestion would require only 46 primary holes.

I concur with the last suggestion but would add four holes near the east edge of the property (see figure 2) and would include one important proviso, namely that the wider spacing of the primary holes be used in conjunction with radiometric logging of these holes.

The geologic report by Robinson gives a complete and accurate summary of available information. As pointed out by him, exploration to the south of the Flat Top-Vilatie Hyde claims by the Santa Fe Railraod and to the west by F. O. Manol and the Santa Fe suggests that these claims lie in a vaguely defined belt of mineralized ground. This exploration in secs. 25, 30, and 31 found about 25 ore bodies in a total drilling area of nearly 1 square mile. These ore bodies are estimated to contain about 80,000 tons of ore averaging about 0.20 to 0.25 percent U_3O_8. The average ore-body thus contains about 3,000 tons of ore. Assuming this same frequency of ore occurrence

(25 ore bodies per square mile), one or two such bodies would expectably be found on the Flat Top-Vilatie Hyde claims which have a total area of slightly more than 1/16 of a square mile. There thus appears to be a favorable chance of finding 3,000 to 6,000 tons of ore on these claims.

Ore of this grade (0.20-0.25% U_3O_8) would be worth from $14.00 to $18.25 per ton (base price plus premium). Repayment of the loan at 5% would thus return to the Government between $0.70 and $0.9125 per ton. If the operator would agree to subject his bonus to the lien he would repay an additional $0.70 to $0.8750 per ton on the first 2,000 to 2,500 tons only. Hence it appears that if 6,000 tons of ore of this grade are discovered, repayment of between $4,200 and $7,225 can be expected. Perhaps, therefore, the costs of the proposed federally aided exploration should be reduced below the amount applied for. One method of accomplishing this which might be successful would be wider spacing of the primary drill holes.

According to the examiners' reports, the ore-bearing limestone on the Flat Top-Vilatie Hyde claims is buried beneath 6 to 75 feet of "soil cover", and the average depth of holes is estimated to be 70 feet. As the limestone is itself on the order of 20 feet thick, the average depth of cover would appear to be about 50 feet. The "cover" in most parts of these claims consists of windblown sand and alluvium which would have to be stripped in mining as neither the sand nor the limestone would support a roof for underground work. The average thickness of the cover is considerably larger than that being stripped elsewhere in the district. Costs of stripping might be so significantly higher than other current operations in the district as to require larger or richer ore bodies in order to justify mining. This consideration also seems to me to recommend the wider spacing of the primary drill holes.

The ore bodies already found in the vicinity of the Flat Top-Vilatie Hyde claims range in area from about 25 x 25 feet to 800 x 100 feet. Most of them are elongated, the length being several times the width. According to Mr. Melancon, they are surrounded by a zone in which the radioactivity is measurably higher than the radiation background of limestone, and such zones of increased radioactivity may extend as much as 100 feet beyond the limits of ore.

In order to find the expected amount of ore, primary drilling on 100-foot centers would be necessary in order to intersect the small, elongated ore bodies. If, however, advantage be taken of the radioactive "halo", I believe primary drilling could be done on 200-foot centers. Radiometric logging of the drill holes would give this advantage. Without radiometric logging, negative results on a 200-foot spacing would not disprove the area drilled, because an ore body up to 200 feet in diameter and containing as much as 10,000 tons could be completely missed. With radiometric logging, the radioactive halo around such an ore body would expectably be intersected by at least one hole.

Radiometric logging to determine this relatively "favorable" ground has been done by the Atomic Energy Commission with scintillometer equipment and by some operators with simple geiger counters having long cords on the probes. In-hole logging may also soon be available commercially in the district through Manol and Rappaport.

Use of in-hole radiometric logging would permit the primary holes to be drilled without sampling and provide another saving. But all offset holes should be sampled through the entire thickness of the limestone, because radiometric logging has not as yet been demonstrated to yield reliable determinations of grade. Radiometric logging or scanning of the samples can, however, be used to select the samples of potential ore-grade for assaying.

Because of the small size of the deposits, I would add the four primary holes circled in ink on figure 2, to the scheme suggested by the Field Team. Too large an area is left untested by omitting these holes.

The amount of offset drilling that will be needed to complete the project is difficult to estimate. Judging again from the distribution of the known deposits, 10 to 20 percent of the area might merit further testing by closer spaced drilling, and up to 2 or 3 percent of the area might be underlain by ore-grade material.

It should be pointed out that the ore occurs throughout the limestone at all positions between top and bottom. In order to insure drilling through the entire thickness, all holes should penetrate at least 2 feet into the underlying sandstone. If in-hole logging is contemplated, the hole should be drilled 5 feet below the base of the limestone, especially in the deeper holes. This insures being able to log the entire thickness of the limestone even though the hole is partly filled by sloughing. I am not sure that this factor was considered by the examiners in arriving at their estimated average depth of hole.

J. D. Strobell, Jr.
Geologist

JDS/je

cc: King and Koschmann (4)
Reading file

MINING DIVISION
REGION IV

June 18, 1953

Memorandum

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMEA-2897, Flat Top-Vilatie Hyde Uranium Claims, McKinley County, N. Mex.

Enclosed are original and 10 copies of the section on Summary, Conclusions and Recommendations by M. J. Elsing of the Bureau of Mines and R. F. Robinson of the Geological Survey, and the section on Engineering by Elsing. A separate section on geology will be submitted by the Geological Survey.

As a substantial amount of uranium ore may be discovered by this exploratory project, the examiners recommend that a loan for $19,141 be granted the applicant. I concur with their recommendations.

Brochure is enclosed as are 9 copies of Figure 2 for a possible contract.

Walter R. Storms

Walter R. Storms

CC W. H. King (10)
R. F. Robinson
DMEA-2897
DF

WRStorms:frj

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

200 New Customhouse
Denver 2, Colorado

June 8, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2897, Flat Top-Vilatie Hyde Claims (Uranium), McKinley County, New Mexico.

Enclosed are the original and 10 copies of the geologic report by Raymond F. Robinson of the U. S. Geological Survey covering the above docket.

It has been recommended that the loan be approved.

The brochure is enclosed.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (12)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O.Box 4126, University Station
Tucson 5, Arizona

June 4, 1953

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: Raymond F. Robinson, Tucson, Arizona

Subject: Geologic Report, DMEA 2897, Flat Top-Vilatie Hyde Claims (Uranium), McKinley County, New Mexico

Accompanying this letter are the original and 10 copies of the geologic report on the subject docket. A separate engineering report has been submitted, although the U. S. Bureau of Mines did not participate in the examination.

The writer is of the opinion that the results of exploration and mining in the vicinity of the Vopat, et al property indicates a trend in the distribution of economic quantities of uranium mineralization. The Vopat, et al property lies well within the southeasterly extension of this favorable zone and it appears that there is a reasonably good chance to discover new ore bodies on it.

It is recommended that a DMEA loan totalling $19,736 for complete drilling of the property be granted. The Government's share of this program will be $17,762.

The field team should consider the possibility of substituting the scintillometer logging device of the Atomic Energy Commission for sampling and assaying in the proposed program. If this can be done, several thousand dollars allotted for the eliminated items can be saved.

The brochure is enclosed.

Raymond F. Robinson

Raymond F. Robinson
Acting District Supervisor
Arizona-New Mexico

Enclosures 11

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

12/18/53

DMEA-2897, Flat Top-Vilatie Hyde Uranium Claims

McKinley County, New Mexico

M. J. Elsing, Consulting Mining Engineer
U. S. Bureau of Mines

R. F. Robinson, Geologist
U. S. Geological Survey

June 1953

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

M. J. Elsing[1] and R. F. Robinson[2]

On February 17, 1953, the Field Team of Region IV, Defense Minerals Exploration Administration, requested that an examination and report be made on the feasibility of Government assistance in the amount of $19,141 for the exploration of uranium on the Flat-Top-Vilatie Hyde claims, McKinley County, N. Mex. The application was made by Richard Vopat (a partnership). The project has been given Docket No. DMEA-2897 (Uranium).

On May 4 - 6, 1953, R. F. Robinson went to Grants, N. Mex., met Vopat and with him examined the property. Robinson also interviewed various Atomic Energy Commission officials, including the district geologist. M. J. Elsing and J. F. Haynes of the Bureau of Mines, accompanied by Paul E. Melancon of the Atomic Energy Commission at Grants, visited the property on June 2, 1953.

The property is situated 14.3 miles northwest of Grants in McKinley County, N. Mex. and is entirely covered by sandy soil. No outcrops are present. Therefore, it must be evaluated entirely on the basis of information from adjoining areas.

The property consists of 3 unpatented claims comprising approximately 46 acres. These claims cover a nearly rectangular area, 1,550 feet in an east-west direction and 1,300 feet in a north-south direction. The Oscar Manol property lies immediately to the west,

---

1/ Consulting Mining Engineer, U. S. Bureau of Mines
2/ Geologist, U. S. Geological Survey

and property of the Santa Fe Railway is immeidately to the south. Both of these properties are producing high-grade uranium ore from small ore bodies.

Based on the past history of the operation of these properties, the following conclusions have been drawn:

(1) The property lies within the projected boundaries of what appears to be a favorable zone for uranium mineralization which has been defined by drilling and mining for uranium to the west and south of the property.

(2) The ore bodies which may be found will probably be small, the production of which will range from a few hundred to a few thousand tons of ore. The grade probably will average 0.25 percent U_3O_8 as this is the average of 3,000 tons of ore which has been produced to date on an adjacent property.

(3) The ore will be contained in the Jurassic Todilto limestone. The ore bodies probably will occur from a few feet to 100 feet below the surface. The Todilto limestone on this property varies from 8 to 20 feet in thickness, depending upon the amount of erosion, and the ore may be found at any horizon within it.

(4) The occurrence of the ore is governed by small geologic structures which are not persistent laterally or vertically for large distances and have no predictable trend.

(5) Because of the small size of the ore body and unpredictable extent of the structural controls, it is standard practice to drill areas on a 100-foot center grid pattern. Having discovered ore in one hole it is necessary to delineate the ore body with additional closer spaced holes.

Exploration will consist of drilling 4-inch dry holes with a rotary rig. The W. T. Myers Drilling Co. has agreed to drill holes up to 100 feet in depth for $0.50 per foot. When the ore bearing limestone is encountered, holes will be blown at 2-foot intervals and a sample will be recovered. The cost of drilling this type of hole will be $1.00 per foot for holes up to 100 feet in depth.

The proposed project calls for a total expenditure of $19,141 for drilling 23,030 feet of hole, and all other expenses including supervision, assaying, engineering, bookkeeping, and capital expenditures.

The district geologist of the Atomic Energy Commission is familiar with the area. In a letter, dated May 26, 1953, he stated that the property is definitely worth considering for a loan. He further stated that the proposed drilling pattern is normal for exploration in the limestone, and it has been used extensively and fairly successfully by both Anaconda and the Santa Fe Railway.

The cost of this project, considering the amount of work to be done, is exceptionally low. Myers has submitted a very low cost for drilling. The Atomic Energy Commission officials have advised that he is a good driller and has had much experience in the district. It is only for this reason that it has been assumed that he can drill at rates at which he has bid.

It is proposed that if the project is approved that it be set up on the basis of a short form contract. The total price per foot of hole should be 83 cents, of which drilling amounts to 64 cents per foot, and supervision, assaying, and all other expenses amount to 19 cents per foot. The applicant should pay all costs in excess of this amount.

Provision has been made for drilling 197 primary holes 70 feet deep and 132 fill-in holes which will also average 70 feet deep. It is anticipated that these 329 holes will cut 20 feet each of the ore-bearing limestone. Provision has been made for sampling each 2 feet of the limestone. This means 10 samples per hole, or a total of 3,290 samples. Each of these samples should be tested with a Geiger counter. Allowance has been made for assaying 200 samples by chemical methods. The cost of this has been set at $7.50 per sample to allow for assaying, transportation, express, and check sampling by Ledoux & Co., or some very reliable umpire.

It must be the duty of the examining team to make certain that all limestone is sampled and that an adequate number of samples are assayed. The whole purpose of the project is to get assays in order to determine the tonnage and the grade of the ore.

If the applicant did not take all of the samples provided for he could easily save more than his cost of the project. With 20 feet of limestone in each of 329 holes there will be a total of 6,580 feet of limestone. The ordinary drilling of this footage would be at 50 cents per foot, or $3,290. If samples of this footage are recovered the cost will be $1.00 per foot. A total of $1,500 has been allowed for assaying. Since the applicant is being allowed these sums the examining team should use more than ordinary care to make sure that adequate sampling and assaying are done.

Because of the need for uranium for the defense effort and because it is believed that there is a reasonable chance that this project will result in the discovery of uranium ore in economic amounts, it is recommended that an exploration project on the Flat Top-Vilatie Hyde claims be approved on the basis of an expenditure of $19,141.

FLAT TOP-VILATIE HYDE CLAIMS
(RICHARD VOPAT, ET. AL.)
MCKINLEY COUNTY, NEW MEXICO
DMEA 2897

URANIUM

Geology

By
Raymond F. Robinson
Geologist, U. S. Geological Survey

FLAT TOP-VILATIE HYDE CLAIMS
(RICHARD VOPAT, ET. AL.)
MCKINLEY COUNTY, NEW MEXICO
DMEA 2897

URANIUM

GLD 12/18/53

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INTRODUCTION

The writer visited the Grants, New Mexico area May 5 and 6, 1953, in order to examine the property of Richard Vopat, et. al., designated as the Flat Top-Vilatie Hyde Claims Nos. 1, 2, and 3, for which an application for a DMEA exploration loan has been made. May 5 was spent obtaining information and discussing exploration problems with Mr. Paul Melancon, Chief of the Atomic Energy Office at Grants, New Mexico. Mr. Melancon gave whole-hearted and friendly cooperation and provided pertinent data in the form of maps, drill hole data, and general information on the area. May 6 was spent examining the Vopat property and also several adjoining properties on which mining is being conducted.

Since the Vopat property is completely soil covered, most of the evaluation of the property as a potential uranium-bearing area must be made on the basis of information gained from surrounding operations. The information in this report was obtained largely from Mr. Melancon, publications of the U. S. Geological Survey and the Atomic Energy Commission, from personal observations, and from discussions with Mr. Oscar Manol, Mr. Irving Rapaport, and Mr. William Coffey. The latter are operators of producing mines adjoining the Vopat property.

The Bureau of Mines did not participate in the examination of this property, but an engineering report has been prepared by Mr. M. J. Elsing from information provided by the writer, the docket, and other engineers.

GENERAL DESCRIPTION

The Vopat, et. al. property is located in the south half of the SE quarter of Section 30, T. 13 N., R. 9 W., McKinley County, New Mexico.

It lies 11 miles north of the San Mateo-Highway 66 junction which is 3 miles west of the AEC office in Grants, New Mexico.

The whole area is readily accessible in dry weather by means of jeep or truck. The conditions of most of the branch roads are subject to weather conditions and are poor to impassable during wet weather. The San Mateo road is a fairly good truck road from the Vopat property to U. S. Highway 66, a paved road. The Anaconda buying station is located about five miles west of the intersection along Highway 66 at Bluewater. The main line of the Atcheson-Topeka and Santa Fe railroad parallels Highway 66.

The general area is drained by the San Jose River, a tributary of the Rio Grande, and there are no perennial streams in the area. The water for farming, the principal industry of the area, is obtained largely from wells. The rainfall averages about 14 inches and the country is semi-arid. The days are warm and nights cool. In winter freezing temperatures are reached but the days are pleasant in the river valley.

The vegetation is sparse and consists of sage, grasses, and flowers, juniper, pinon pine, varieties of cacti, greasewood, and some cottonwood. On the high slopes of Mt. Taylor to the east yellow pine, fir, spruce, and aspen are found.

Topographically, the immediate area is predominantly of low relief and lies between 6500 and 7000 feet elevation. Several miles to the east, Mt. Taylor arises about 5000 feet above the river valley, or 11,300 feet above sea level. The San Jose occupies a broad valley incised in soft Triassic shales of the Chinle formation. The south side of the valley abuts against recent volcanic flows. On the north lie a series of low, south-facing

bluffs and mesas. The escarpments are formed by resistant sandstone members and the flat mesas above by soft shales of several formations. The mesas dip gently north and are soil-covered to varying degrees.[1/]

The Vopat property is located on one of the flat mesas about a half mile north of the first escarpment to the north of the San Jose River. It is completely soil-covered from depths ranging from 6 to perhaps 75 feet. There are no rock outcrops present on the property. The local relief is very slight, the altitudes ranging from 6,835 on the southwest to 6,800 on the northeast side (see fig. 2).

Ownership

The ownership is mentioned in the engineering report. The claims, Flat Top-Vilatie Hyde Nos. 1, 2, and 3, consist of 2 and 2/3 claims, an area embracing approximately 45 square acres (see fig. 2). The claims were originally owned by Mrs. Vilatie Hyde. Mr. Frank Manol, acting as agent, negotiated the sale of the claims to the Vopat (et. al.) partnership. Mrs. Hyde retained a 5% royalty interest by common agreement and Mr. Manol retained a 10% royalty interest for his part in the transactions. Due to a dispute over actual ownership of the claims early in the transactions, a quiet title suit was necessitated. Mr. Vopat has been asked to submit all pertinent information on this matter. The land here has been withdrawn by the Atomic Energy Commission but the Vopat claims are not affected by this because they existed as valid claims prior to the withdrawal. No gas or oil leases have been taken on this property, according to Mr. Vopat and the Bureau of Land Management. Local ranchers retain grazing rights on all of the area.

1/ Hunt, Chas. B., The Mt. Taylor Core Field, Pt. 2 of Geology and Fuel Resources of the Southern Part of the San Juan Basin, New Mexico: U.S.G.S. Bull. 860B, 1934-36.

Past Work on Property

There has been no production from mining on the Vopat property. Some bulldozing was done last year for assessment work but the trenches are sloughed in and nothing of value to an examination can be seen. Bed rock was reached in some to the southwest at a depth of about 6 to 8 feet. Last year 31 wagon holes were drilled as shown on figure 2 of this report and a map accompanying the engineering section. These holes showed little or no values when probed by the AEC using the regular geiger counter. The AEC office feels, however, that this drilling was not entirely satisfactory and that the proposed exploration work should include some drill holes to check. The wagon drill holes did not have sufficient diameter to permit the use of the scintillometer device now in use in the area.

The writer checked the holes on the Vopat property with a geiger counter against the nearby holes on the Manol property on the west side of Vopat's claims. It was noted that the recordings were at least three times higher at collars of the wagon hole drills on the Vopat claims than those on Manol ground.

GEOLOGY

Stratigraphy

The stratigraphic column for the area about the property is given below. It is taken from RMO 642[2/].

2/ Rapaport, Irving, Hadfield, J. P., Olson, Richard H., Jurassic Rocks of the Zuni Uplift, New Mexico: U. S. Atomic Energy Commission, RMO 642, March, 1952.

Age	Group	Formation	Type	Thickness
Upper Jurassic	Morrison	Brushy Basin*	Ms Ss	0-130
		Westwater Creek	Ss	30-290
		Recapture Creek	Ss Sts Sh	0-140
" "	San Rafael	Bluff	Ss	220-630
		Summerville	Ss Sto Sh Ls	0-190
		Todilto**	Ls	0- 30
		Entrada	Ss	130-280
		Carmel	Sto Ss	55-260
Tower and/or Middle Jurassic	Glen Canyon	Wingate	Ss Sts	0-120
Triassic	Chinle		Ms Sh Ss Ls	850±

* Shattuck Denn operation in this horizon.
** Principal producing uranium horizon.

On the Vopat and adjoining properties, the Todilto limestone is the principal uranium-bearing horizon. The local thickness is 12-20 feet. Erosion has removed most of the overlying Summerville on the property except possibly on the northeast corner (where some of it may be left). Figure 2 shows, by means of structural contours along the base of the Todilto, that in this corner the base of the Todilto is over a hundred feet deep. According to drill hole data, as much as 8 feet of the Todilto may have been removed by erosion on the southwest corner of the property. Since the formational dip is to the northeast, full thickness of the formation may be expected over much of the property. This cannot be ascertained at present because, as mentioned previously, the claims are completely soil-covered to a depth of 6 to 75 feet.

The Todilto formation may be conveniently subdivided into lower and upper sections on a lithologic basis. The upper portion is a dark-grey, dense, thinly-bedded limestone. The beds are well marked and show considerable crinkling and crenulation. It has undergone recrystallization. The lower portion is dark grey, dense, thick-bedded, lithographic textured limestone and near the base it contains interfingering lenses or beds of

calcareous silty sandstone. The formation as a whole is unfossiliferous and is said to have a petroliferous odor on fresh fractures.

According to RMO 642[3/] the Entrada sandstone underlays the Todilto limestone conformably. The Entrada is said to be largely eolian in origin and the Todilto formed in a lacustrine basin. The Summerville overlies the Todilto conformably and in turn is overlain in the same way by the Bluff. The latter two formations are though to be fresh-water stream deposits on flat-lying planes.

The Summerville and Bluff have been completely removed by erosion from the Vopat property.

The Morrison group overlays the lower formations conformably. It is considered to be fresh-water deposits on flat-lying flood planes by streams which deposited chiefly during flood times. They contain much organic matter in the form of vegetation and dinosaur remains. In the Grants area the Brushy Basin and West-water members contain carnotite-like deposits associated with organic remains. (Shattuck Denn operation is in Brushy Basin). These have been removed by erosion from the Vopat property.

Structure

The uranium producing area near Grants lies on the north flank of the Zuni Uplift, believed to be of early Tertiary age. The McCarty syncline lies north and east of the area. It appears that this uplift has been particularly instrumental in the structural deformation of the Grants area and produced conditions which led to the localization of uranium ore bodies.

The Zuni Uplift is a broad asymmetrical dome about 65 miles long, elongated in a northwest direction, and about forty miles wide. The southwest portion has strata dipping south up to 80 degrees, while on the north flank, the strata are gently dipping northward. Structural relief is estimated to

3/ Op. cit.

be 6,600 feet and a Pre-Cambrian crystalline core is exposed on the highese parts of the dome.

The McCarty syncline has been structurally depressed about 1500 feet below the mass of Mt. Taylor volcanics. Dikes which cut through the Grants uranium-bearing area are thought to be related in origin with this mass.

Folding

Several broad folds on the north flank of the uplift are believed to have formed with it. The Vopat and adjoining properties lie on the northwest flank of a broad gentle syncline which strikes about north 50° east and is followed by the San Mateo road for some distance. The axis of this fold is marked by a paralleling fault showing a displacement of about 275 feet. The east side is the down-dropped block (see fig. 1).

Minor small-scale folding is present in the uranium-bearing areas and was especially instrumental in localizing the known ore deposits in the Todilto limestone. The folds range from a few inches to a few feet in amplitude. Early work done indicated that they were slumpage folds formed during deposition and prior to lithification. Recent work[4/, 5/] has shown that the folds form a right angle conjugate pattern which is definitely in alignment with the trends of the major Zuni Uplift structures. In addition to the Todilto, the top of the Entrada and the base of the Summerville formations have been involved in the folding. It is now believed that the folding was caused by the response of the relatively incompetent Todilto to slippage between the competent Summerville and Entrada formations during the Zuni Uplift.

4/ Gilkey, Arthur K., Fracture Pattern of the Auni Uplift, Second Progress Report: U. S. Atomic Energy Commission, RMO 897, November, 1952.

5/ Op. cit.

Faulting

Contemporaneity of faulting and folding is shown by the fact that one is observed to pass into the other along the strike so that both are probably related to the major uplift. The faulting also has a right angle conjugate pattern similar to the folding and the pattern suggests that they are tensional breaks in response to vertical forces during the Zuni Uplift.

There is very little faulting in the immediate area of the Vopat property. However, to the northwest in the vicinity of the common corner of sections 23 and 25 a considerable amount of faulting, with minor displacement, has taken place (see fig. 1). The distribution of the ore bodies and the faulting as shown do not necessarily indicate a close association of the two.

Jointing

Jointing exhibits patterns similar to folding and faulting, and all indications are that they have originated from common causes. Jointing is partly responsible for localization of the ore shoots.

Mineralization

The ore minerals present in the deposits in the Todilto are chiefly tyuyamunite, pitchblende, carnotite, and uranophane. Fluorite, barite, pyrite, hematite, and limonite are also present in varying amounts.6/ Red alteration halos are noted about dark black pods of pitchblende (personal observation).

ORE DEPOSITS

A satisfactory examination of the property cannot be made because of complete soil cover. In order to evaluate the geologic possibilities for ore occurrence here, attention must be turned to information which has

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6/ Rapaport, Irving, Interim Report on the Ore Deposits of the Grants District, New Mexico: U. S. Atomic Energy Commission, RMO 1031, November, 1952.

been obtained from results of exploration in adjoining areas, especially on the west and south. No work has been done east of Vopat's claims. Geologic mapping, drilling, radioactive logging of drill holes and mining has developed what appears to be a trend of the mineralization in this area. Figure 1 shows the trend of the belt, which appears to be favorable for ore occurrence in the areas which have been drilled out to date. This belt is defined in only a general way by connecting the outside boundaries of the known ore bodies within the explored areas. Figure 2 shows the picture close to the Vopat claims on a larger scale at the adjoining properties of the Santa Fe on the south and the Oscar Mandl property on the west. It is very suggestive that the Vopat claims lie well within the probable extension of the belt, as defined; thus, the geologic indications may be said to be favorable and a reasonably good chance exists that ore will be found on the property.

Elsewhere in the area definite ore controls have been established which are present in almost all the deposits now being worked. The crests and flanks of small anticlinal flexures are especially favored placed for localization of uranium ore shoots. The reason for this may be that these areas are most permeable due to fracturing and recrystallization due to folding. They may also actually have acted as structural traps for solutions circulating within the formation. The upper thin-bedded formation is said to have larger and richer ore shoots than the lower massive section, which may be explained in the light of relative permeability. The deposits are also said to be largely fillings in joints and fractures with very little replacement and dissemination within the rock itself.7/

7/ Unpublished data, Atomic Energy Commission Office, Grants, New Mexico.

Unfortunately, the folds are so small that they cannot be traced laterally or vertically far enough to be of value in locating ore shoots where cover of younger formations is thick or extensive. However, once the ore has been found, these controls help simplify the extraction and planning of mining operations.

Fortunately, it was possible to check the various geologic aspects in the open pit mine of Oscar Manol on the west side of the Vopat claims. This pit is shown on figure 2 and lies only 2000 feet west of the west side line of the Vopat claims. The showings were very much as described in the literature in the various AEC publications. However, while a great deal of the ore does occur as fracture and joint fillings by tyuyamunite, uranophane, etc., very definite examples of disseminated ore were found in the more massive and thicker beds. A great many pods and fine-grained dense black material (which showed very high reactions approximating 5 to 10% U_3O_8) were found; these are apparently pitchblende. They appear most abundantly in and along bedding planes. These showed various degrees of alteration to the yellow and orange uranium oxide minerals, so that both primary and secondary disseminationed ore occurrences are actually present. According to Manol (personal communication) the black mineral is the material "which really raises the grade of the ore." It was also noted that this material is accompanied by red halos, which should serve as additional guides for identification of this "high grade." It would seem most likely that the high grade occurrences are hydrothermal replacements and that most of the other secondary minerals have been derived from them.

The irregularity of the distribution of the ore shoots and the small size of their occurrences are indicated on figures 1 and 2. Quite a large number of deposits have been found in the northwest portion of the

belt where faulting is most abundant, but just as many occur along the belt of mineralization where there is no appreciable faulting recorded. Enough evidence to fully explain the distributions has not yet been assembled.

The bodies which have been found and may yet be expected to be found are very small. They range from those containing a few hundred tons to those which may contain a few thousand. To date only about 100,000 tons of ore has been shipped from this Grants area. Production on the property west of the Vopat claims has been exceptionally good. Three thousand tons have been shipped from here to date, which probably averaged about .25% U_3O_8. Most of this has come from the larger pit shown on figure 2. The cut-off grade for mining here is not a static figure and is dependent upon the factor of depth of rock or soil cover - whether the ore body can be mined by open pit or underground methods. It is also dependent upon the indicated tonnage. To date almost all production has come from relatively cheap open-pit mining - no "yardstick" cut-off grade has been established for underground mining to date here.

METHOD OF EXPLORATION

The nature of these occurrences of uranium - relatively shallow-seated, rich, small and irregularly spaced shoots or bodies - requires that the areas to be explored must be drilled very closely. To date the standard pattern developed as the most reliable method is drilling on a grid pattern with 100 foot centers. Within this pattern it is safe to assume that no significant ore body will be entirely missed. "Fill in" holes are then needed to close in around anomalous primary grid holes in order to delimit the ore occurrence. Fortunately, most of the area under exploration (to date) has very shallow or no covering on the favorable horizon and drilling can be

done relatively cheaply at 50¢ / foot. Eventually the Todilto area, under the cover of younger formations of the Morrison group, will be considered for exploration and drilling will be vastly more expensive.

Method of Sampling

At the present time no sampling is being done on the holes being drilled for exploration work in the area. The operators are entirely dependent upon the AEC logging device, based upon the use of the scintillometer for determining what constitutes ore or where the cut-off occurs. Several operators in the area were consulted and they expressed the opinion that the logging device was far better than sampling core or blowing out the cuttings for sample and assay from a hole at various intervals. They believe it to be more accurate and dependable by far. It appears that this instrument is a fine and indispensable guide for uranium production in the area. The principal question which arises now is whether or not the field team will accept this method as a substitute for sampling and chemical assaying in the contract. Since the operator must, in his final report, provide an estimate of ore reserves - tonnage and grade - he will have to have one of the two methods to guide him. If the AEC logging method can be used, it will eliminate half the cost of class two (fill-in) holes, sampling and assaying, which represents between five and six thousand dollars.

The AEC field men have been instructed not to take responsibility for calculating tonnage and grade with the logging device. However, it was intimated that it could be done at least to a reasonable degree of accurace by calibration. Several operators stated that it could be done to the satisfaction of practical operation. It is felt that this is a technical matter to be solved by the field team and the AEC, but it is believed that

acceptance of the logging method over the more expensive sampling of the drill holes and chemical assaying should be made if it is feasible to do so.

CONCLUSIONS

The Vopat property is entirely covered by soil and no outcrops are visible. Therefore, the property must be evaluated in the light of information from the adjacent operating and previously explored properties.

There is a reasonably good chance to find uranium ore bodies of economic proportions on the Vopat property. This conclusion is based upon reliable information from the nearby mining operations and from the Atomic Energy Commission personnel. The property lies well within the projected boundaries of what appears to be a favorable zone for the localization of uranium mineralization. The boundaries of this zone are generally defined by the results of exploratory drilling and mining on the west and south sides of the Vopat property.

The ore will be contained within the Todilto formation of Jurassic age, which is principally a limestone. It varies from 8 to 20 feet in thickness and the ore may occur at any horizon within it.

The ore bodies which may be found will occur from 6 to perhaps 75 feet beneath the surface. They will very likely be small, and the production from them will probably range from a few hundred to a few thousand tons of ore. The average grade will approximate .25% U_3O_8; this is the average of 3000 tons of ore produced from an adjoining property on the west. The economic limits of mining will be defined largely by the depth of the bodies from the surface.

The occurrence of the ore is governed by small geologic structures such as folds and jointing which are not persistent laterally or vertically for appreciable distances and have no predictable trend. They are not good

guides for exploration, particularly in the case of the Vopat property, but they are very helpful in the mining operations as guides in following the ore.

Because of the small size and erratic distribution of the ore bodies which can be expected, and the lack of structural controls which can be utilized in exploration planning, it is necessary and standard practice to drill areas on grid patterns with 100 foot centers. Additional drilling to close in on ore bearing grid holes is necessitated to delimit an ore body.

If the field team will accept the use of the scintillometer logging device to determine tonnage and grade in this particular program in place of sampling and chemical assaying, several thousand dollars can be saved.

DMEA-2897, FLAT TOP-VILATIE HYDE URANIUM CLAIMS
McKINLEY COUNTY, NEW MEXICO

Engineering Report

By M. J. Elsing
Consulting Mining Engineer
U. S. Bureau of Mines

June 1953

DMEA-2897, FLAT TOP-VILATIE HYDE URANIUM CLAIMS
McKINLEY COUNTY, NEW MEXICO

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INTRODUCTION

ACL 12/17/53

On February 17, 1953, the Field Team, Region IV, of the Defense Minerals Exploration Administration requested that an examination and report be made on the feasibility of Government assistance in the amount of $19,141 for the exploration for uranium on the Flat Top-Vilatie Hyde claims, McKinley County, N. Mex. The application was made by Richard Vopat (a partnership). The project has been given Docket No. DMEA-2897 (Uranium).

On June 2, 1953, M. J. Elsing and J. H. Haynes of the U. S. Bureau of Mines in company with Paul E. Melancon of the Atomic Energy Commission at Grants visited the property.

LOCATION

The property includes 2-2/3 claims covering 46.67 acres and is located in the south half of the southeast quarter of Sec. 30, T. 13 N., R. 9 W., McKinley County, N. Mex. (see figure 1).

The property is approximately 14 miles northwest of Grants, N. Mex., which will be the supply center and living quarters for men employed at the project.

The property is reached from the Atomic Energy Commission office in Grants by travelling west on U. S. Highway 66 for 3.2 miles. At that point State HIghway 63 (San Mateo road) is followed to the north for 11.1 miles where a turn is made to the west passing through a gate near which the property is entered.

From the property it is approximately 16 miles to the Anaconda Copper Co.'s buying station situated at Blue Water, N. Mex.

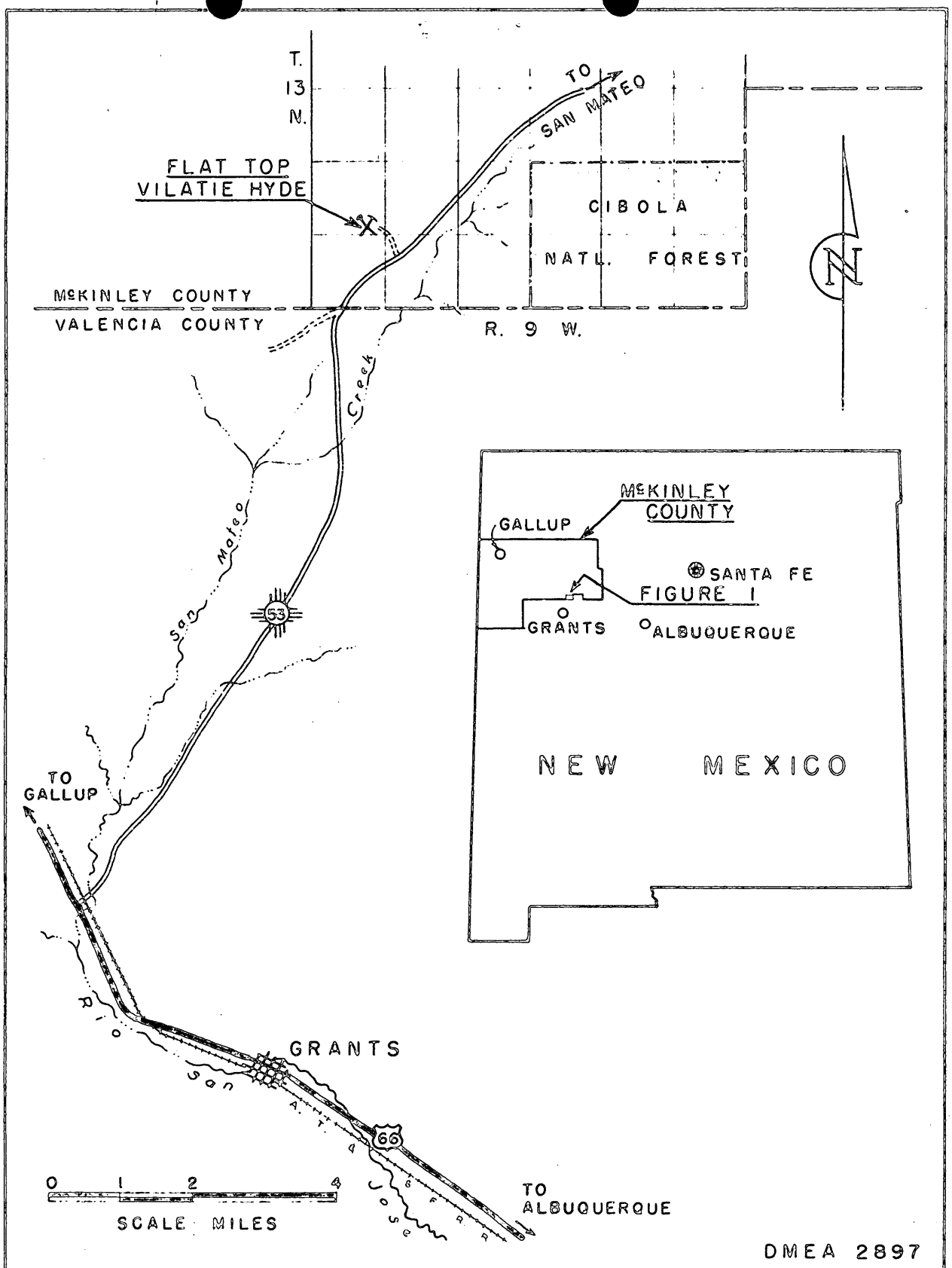


FIGURE 1. - LOCATION MAP - RICHARD VOPAT
FLAT TOP - VILATIE HYDE CLAIMS MCKINLEY COUNTY, NEW MEXICO

OWNERSHIP AND EXTENT

The property comprises 3 unpatented mining claims known as Flat Top-Vilatie Hyde Nos. 1 to 3, inclusive, the titles to which are recorded in the County Recorder's Office at Gallup, N. Mex., the county seat of McKinley County, in the book of Miscellaneous Records and at the page number shown below:

Claim	Book	Page
Flat Top-Vilatie Hyde #1	10	287
Flat Top-Vilatie Hyde #2	10	288
Flat Top-Vilatie Hyde #3	10	288

The property is owned by a partnership including:

Richard Vopat, 601 Court St., Scott City, Kansas;
Howard T. Young, 911 Church St., Scott City, Kansas;
Dr. R. H. Spencer, 606 Russell St., Scott City, Kansas;
Fred W. Heine, Lucas, Kansas;
Robert R. McNeely, 337 So. Terrace Dr., Wichita, Kansas.

The original owner of these claims was Mrs. Vilatie Hyde, Blue Water, N. Mex. Mrs. Hyde has retained a perpetual 5 percent royalty interest in production, and Frank Manol, Aztec, N. Mex., has a perpetual 10 percent royalty interest by virtue of turning the property from Mrs. Hyde to the partnership.

The area in which the Flat Top-Vilatie Hyde claims are located has been withdrawn from mineral entry for the Atomic Energy Commission. However, these claims were located prior to this withdrawal. Vopat stated that in order to establish title to these claims, suit to quiet title was brought and the title was established beyond any question.

In order to establish ownership of these claims Vopat submitted information which shows the more important links in the chain of title as follows:

(1) Original location notices filed December 11, 1950 and followed by amended locations;

(2) As part of an escrow agreement, Mrs. Vilatie Hyde and Arthur W. Hyde on December 17, 1951 filed a warranty deed in favor of Frank O. Manol and Hazel I. Manol;

(3) On January 10, 1952, the Manols gave a quit claimdeed to Richard Vopat for a 1/5 interest in the property.

Vopat stated that the Quiet Title action was the result of differences between the Hydes and the Manols and that their differences were compromised by providing the already mentioned royalty payments.

Paul Melancon, representative of the Atomic Energy Commission at Grants, advised the examiner that the location of the claims was prior to the land withdrawal order, and therefore valid.

The power of attorney authorizing Vopat to negotiate an exploration contract with the Defense Minerals Exploration Administration, signed May 11, 1953 by Heine, Young, Spencer, and McNeely has been attached to the docket, along with a copy of the quit claim deed to 1/5 of the property from the Manols to Vopat, dated January 19, 1953. This deed was recorded February 5, 1952 in the office of the Clerk of McKinley County in Book 6 of Q. C. Deeds, page 438.

The Manols are reported to have executed four similar quit claim deeds to a 1/5 interest in the property to Heine, Young, Spencer, and McNeely. Copies of these deeds were not seen but it seems reasonable to assume that they exist as Heine, Young, Spencer, and McNelly would not have given a power of attorney to Vopat if this were not the case.

PROJECT PROPOSALS

The Flat Top-Vilatie Hyde claims No. 1 to No. 3, inclusive, are to be explored by drilling on a grid pattern with holes at 100-foot intervals. Having found ore in any hole it is proposed to drill 4 fill-in holes at 10- to 25-foot intervals in 4 directions from the primary discovery hole (see figure 2).

The area to be drilled is 1,300 by 1,550 feet. The southwest corner of this area, comprising a section approximately 300 feet by 600 feet, already has been incompletely and unsatisfactorily drilled by the applicant, using a wagon drill. The diameter of these holes was too small to be probed with the Atomic Energy Commission's scintillometer and their position does not conform to a general grid pattern as now planned. It is proposed to drill 8 holes in the area drilled by Vopat. The balance of the area will require 189 holes. Therefore, the total number of primary holes will be 197.

The depth of these holes will vary from 16 to 100 feet with an average estimated depth of 70 feet. The past history of drilling in the area adjoining this property indicates that one-sixth of the holes to be drilled will encounter mineralization of sufficient interest

to warrant drilling the 4 fill-in holes surrounding the original hole. On this basis it is estimated that 132 fill-in holes will be drilled, each of which will average 70 feet in depth.

W. T. Myers of the W. T. Myers Drilling Co. of Lovington, N. Mex., has submitted the following bid on the drilling:

"Mr. Richard Vopat
Scott City, Kansas

"Dear Mr. Vopat:

"The following bid is submitted on your project located in the SW ½, SE ¼, of Section 30, T. 3 N., R. 9 W., Valencia County, Grants, New Mexico:

Class 1 drilling: Plain hole, no casing.	
1st 100 feet or any part thereof	$ .50 per foot
2nd 100 feet or any part thereof	1.00 per foot
3rd 100 feet or any part thereof	1.50 per foot
4th 100 feet or any part thereof	2.00 per foot
5th 100 feet or any part thereof	2.50 per foot
Class 2 drilling: Hole as above but blown clean of cutting every two feet.	
1st 100 feet or any part thereof	$1.00 per foot
2nd 100 feet or any part thereof	1.50 per foot
3rd 100 feet or any part thereof	2.00 per foot
4th 100 feet or any part thereof	2.50 per foot
5th 100 feet or any part thereof	3.00 per foot
Class 3 drilling: Coring in formations amenable to coring.	
1st 100 feet or any part thereof	$3.00 per foot
2nd 100 feet or any part thereof	3.50 per foot
3rd 100 feet or any part thereof	4.00 per foot
4th 100 feet or any part thereof	4.50 per foot
5th 100 feet or any part thereof	5.00 per foot

"Cementing holes and drilling cement plug in fractures and cavities where practical, $3.00 per foot in any depth zone. Standby time $9.00 per hour for delays at your request and account. In the event of such fractures, watercourses, and cavities which make it necessary or advisable to skid our rig, we are to be paid for footage drilled to such a point.

"All three classes of drilling may be combined in any hole in any proportion. We also want to call to your attention that a 500 foot plain hole will average only $1.50 per foot at the above rates. Shorter holes will be proportionately lower.

"The above prices cover all costs of equipment, labor, tools, supplies, materials, payroll taxes, and insurances.

W. T. Myers Drilling Company

By /s/ W. T. Myers
W. T. Myers"

The proposed project can be broken down into 5 parts as follows:

Part I will include drilling the 197 primary exploration holes, the average depth of which will be 70 feet. A total of 13,790 feet of drilling will be done at an average contract price of $0.64 per foot, or a total of $8,826 (50 ft. @ $0.50 and 20 ft. @ $1.00 for each hole).

Part 2 will include drilling 132 fill-in holes, the average depth of which will be 70 feet.

It is known that ore, if present, will be found in a bed of limestone which averages about 20 feet in thickness. The past record of drilling in the district also shows that the ore in any one hole may have a total thickness of approximately 5 feet and may consist of one or more mineralized beds in the limestone. The elevation of the ore horizon in the primary holes will be located by a scintillometer and the fill-in holes will be drilled on the basis of this information. The first 50 feet of hole will be drilled under Class 1 of the drilling contract at a cost of $0.50 per foot, and 20 feet under Class 2 at $1.00 per foot. Class 2 drilling provides for blowing the hole clean of cuttings every 2 feet. There will be 10 samples for each hole. The 132 fill-in holes will cost $45 each (50 feet @ $0.50 and 20 feet @ $1.00), or a total of $5,940.

Part 3 of the project provides for chemical assaying. As soon as a hole enters the limestone the drill cuttings will be blown from the hole at each 2-foot interval and caught in a collector. On the assumption that the limestone ore horizon is 20 feet thick, there will be 10 samples for each hole. A Geiger counter will be used to determine which of these 10 samples should be assayed chemically. Since the average thickness of the ore is approximately 5 feet, not more than 3 2-foot samples will need to be assayed and if necessary two could be combined for one assay. Assaying usually costs $5.00 per sample. With transportation and the cost of sacks the cost per sample is estimated at $7.50.

A total of $1,500 has been set up for assaying. This provides for 200 samples at $7.50 each. This should cover transportation including express, chemical assaying, sample sacks, and some check assaying by Ledoux & Co. or some other very reliable umpire.

Part 4 includes supervision, engineering, and miscellaneous expenses, and Part 5 includes items considered to be capital equipment but not paid for under the contract.

TIME SCHEDULE

The contractor has estimated that the maximum drilling footage will be 400 feet per shift and that the average will be 300 feet per shift. Work probably will be done on a 6-day week and confined to the day shift only. The total footage of primary holes is 13,790 feet, and with drilling at the rate of 300 feet per shift, the drilling time will be 7.7 weeks.

There are 9,240 feet of fill-in holes, the drilling of which will be at the rate of approximately 300 feet per shift. The time required for drilling these holes will be 5.2 weeks, or for all drilling the overall time required will be about 3.0 months. Costs are set up on the basis of one half month to prepare for drilling and one half month after drilling to complete assaying and make the final report on the project. This is a total of 4.0 months.

PERSONNEL AND DUTIES

Practically all work at the property will be done by a contract driller but there will have to be a supervisor and a part time engineer. Both are readily available. Richard Vopat, a partner in the project, will be the supervisor. He has suggested that he be employed at a daily rate but it is preferable that he work on a monthly salary basis. His duties would be to help the engineer lay out and stake each hole to be drilled, measure and keep a record of the footage of each hole drilled, and see that the contractor keeps daily log records of drilling which the supervisor should file for future reference. He should observe the taking of samples, properly number and describe each, test each sample with a Geiger counter and send high-grade samples to an assayer for the determination of uranium by a chemical process. He should keep charts, maps, and all necessary data, including the location of each sample, its assay grade, location in the hole, and the footage extent of the sample. The method of keeping these records should be set up by the applicant's engineer and the Government's examining engineer should be advised of the records to be kept.

The supervisor should keep all books, accounts and monthly reports in connection with the project and pay all bills.

At the end of the project, the supervisor with the engineer should make a final report on the project.

There is nothing difficult about the duties to be performed but it is a full time job and the supervisor should be expected to be at the property during the entire time that drilling is being done.

The services of an employed engineer living at Grants, N. Mex. are available on Saturdays and Sundays, and possibly other days or parts of days during the week.

The engineer's duties would be as follows:

Lay out and stake all holes to be drilled with the help of the supervisor. This should not require more than a maximum of 3 days. When sampling starts the engineer should be allowed one day to observe and approve the method of sampling and devise a system of keeping sample records in a notebook and on sample maps.

Upon completion of the project the engineer should assist the supervisor in preparing a final report on the project. His particular duties would be to prepare assay maps and ore reserve calculations and other engineering data relative to the project. Three days should be ample to permit this.

Since the supervisor has had no engineering experience it would be advisable to make the engineer available for consultative advice by phone or in person. A total of five days has been allowed for this.

A total of 12 days has been allowed in the project for engineering as shown above.

It is suggested that the pay for the engineer be $27.50 per day, including transportation to and from the mine.

ESTIMATED COSTS OF PROJECT

The following is a summary of the estimate of costs:

Contract drilling		
Primary holes, 13,790 feet @ 64¢ (50 ft. each hole at 50¢; 20 ft. @ $1.00)	$8,826	
Fill-in holes, 9,240 ft. @ 64¢	5,914	
Total, 23,030 feet @ 64¢		$14,740
Assaying, including transportation		
200 samples @ $7.50		1,500
Supervisor		
4 months @ $500, plus 11% for insurance, taxes, etc. (See breakdown which follows)		2,220
Engineering		
12 days @ $27.50, plus 11% for insurance, taxes, etc. (See breakdown which follows)		366
Other Expenses		
Stationery, postage, typing	$75	
Miscellaneous	100	175
Filling Holes		150
Capital Equipment (not allowed)		
Geiger counter and sample splitter		None
Miscellaneous above		$4,411
Drilling by contract		14,740
Total cost of project		$19,141

On this basis the actual cost of drilling will be 64 cents per foot and the incidental and other expenses including supervision and assaying will be 19 cents per foot making a total of 83 cents per foot, which is the price suggested for a short term contract.

Breakdown of Salaries

This figure is an estimated average and may be different for different companies and different individuals. In this estimate the following factors have been used which are as accurate as can be obtained.

Supervisor	Per Month
Salary	$500.00
Old Age Benefits, 1.5% (up to $3,600)	7.50
Federal Unemployment Ins., 0.3%	1.50
N. Mex. Unemployment Ins., 2.7% (up to $3,600; 0.3% thereafter)	13.50
N. Mex. School Tax, approx. 1%	5.00
Workmens Compensation Insurance, Incl. Occupational Diseases varies from 3.984% to 6.1%, estimated at 5.5%	27.50
per month	$ 555.00
4 months	$2,220.00

Engineer	12 days
Salary, 12 days at $27.50	$ 330.00
Old Age Benefits, 1.5%	4.95
Federal Unemployment Ins., 0.3%	.99
N. Mex. Unemployment Ins., 2.7%	8.91
N. Mex. School Tax, approx. 1%	3.30
Workmens Compensation Ins. (estimated at 5.5%)	18.15
Total	$366.30

It is believed that the applicant's salary cannot be materially reduced as his living expenses in Grants will be high and he will have an auto expense of approximately $1.50 per day, or $45 per month which his salary is supposed to include.

OPERATIONAL PROCEDURE

Operational procedure can be outlined only tentatively and should be varied to meet conditions. The schedule of work can be forecast approximately as follows:

(1) The supervisor and engineer will lay out and stake all primary holes;

(2) Myers will start drilling primary holes. It is understood that the Grants office of A.E.C. will probe all primary holes with a scintillometer and will report findings a s drilling progresses. It is believed that as soon as one of the primary holes shows ore of importance that the applicant should be allowed to start drilling the fill-in holes but only after such drilling has been recommended by the A.E.C. engineer and approved by the DMEA engineers.

The distance of the fill-in hole from the primary hole should be recommended by the A.E.C. and approved by the DMEA examiners.

The object of allowing the drilling of fill-in holes before completion of the primary drilling is to obtain as much information as possible as drilling progresses and if possible to find an ore body which could be mined even before the completion of the entire program.

(3) Upon the discovery of ore in a hole the supervisor should, with the advice of the engineer, approve the sampling method and see that samples are taken, identified with tags, tested with a Geiger counter and if necessary have the sample assayed chemically.

(4) Upon completion of a hole it should be covered with a flat rock and its location should be indicated by a stake. This should be the obligation of the driller.

(5) It should be the duty of the supervisor to prepare his reports at the end of the month showing costs and particularly the footage of Class No. 1 holes drilled and Class No. 2 holes.

PROPOSED FINANCING

The project as set up provides for the expenditure of $19,141 of which the applicant proposes to furnish one-tenth or $1,914 and requests that the Government provide $17,227.

CONCLUSIONS

On the basis of the findings on ground developed by Manol to the west and on discoveries on the Santa Fe Railroad ground immediately to the south, it seems that the Flat Top-Vilatie Hyde claims should be equally productive and that the ore bodies will be of more or less the same size and grade. The ore bodies in the district have been small and high grade which accounts for the close spacing of the primary drilling as well as the fill-in drilling. The whole project has been set up upon the generally accepted practise in the district which has the approval of the local A.E.C. officials.

In a letter dated March 3, 1953, from Paul E. Melancon, District Geologist, Atomic Energy Commission, Grants, N. Mex., to A. F. Shride, Acting District Supervisor, Arizona-New Mexico, U. S. Geological Survey, Tucson, Ariz., Melancon stated:

"In regard to your letter of February 26, 1953 regarding the request for a DMEA loan on the Vilatie Hyde claims on sec. 30, T. 13 N., R. 9 W., McKinley County, NewMexico, the property is definitely worth considering for a loan.

"The property is located near a deposit which produced over $60,000 worth of ore in less than three months, and the northern part of the area may be along what appears to be a mineralized trend in which a large tonnage was developed by the Santa Fe Railway in the adjacent section to the west.

"The drilling pattern suggested by the applicants is normal for exploration in the limestone, and it has been used extensively and fairly successfully by both Anaconda and the Santa Fe."

Myers has submitted an extremely low bid for drilling and were it not for the fact that he has been operating for some time in the area and officials of the Atomic Energy Commission have recommended him as a competent driller, his cost estimate of drilling would be accepted with some doubt.

Should drilling of the primary holes listed as Part 1 of the project be unfavorable, it is conceivable that the project should be stopped even before the completion of these holes. For example, if 75 to 100 of the primary holes on 100-foot coordinates were barren it would be advisable to continue drilling at 200-foot coordinates. If these were barren it would be best to stop the project.

The project requires close watching. In a sense it is pioneering because the project differs from the Manol operation in that the Manol deposits either outcrop or are covered by only a few feet of overburden.

In the case of the Vilatie Hyde claims there may be as much as 60 to 70 feet of overburden. To remove 30 or 35 feet of overburden would not be too serious but if the overburden is 60 to 70 feet with a small ore body, waste removal becomes serious because of the excessive amount of material that has to be removed due to the flat slopes of an open pit in soft sandy material.

The grade of the ore at the Manol property is 0.25 percent U_3O_8. The costs and profits are unknown. It is certain that on Vilatie Hyde ground if the grade is 0.25 percent the costs will be higher and the profits will be less. As the depth of overburden increases the vanishing point of profits will be reached. This depth is unknown and there are insufficient data to calculate it. There are many unknown variables and an estimate of costs would be only a guess. As an exploration project especially for uranium, these data are not too important. The main consideration is to find uranium ore of somewhere near a profitable grade. On the other hand this does not warrant continuing drilling beyond the point where it is reasonably certain that substantial amounts of ore will not be found.

RECOMMENDATIONS

Because of the discovery and production of uranium ore from the areas immediately to the west and to the south of the Flat-Top Vilatie Hyde claims, and because the geological and structural conditions are almost identical to these areas, it is recommended that the project of Richard Vopat for the exploration of these claims be approved on the basis of a total expenditure of $19,141.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 24 1953

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

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

Not to be filled in by applicant

Docket No. DMEA 2897
Metal or Mineral
Date Received 2-24-53
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Richard Vonat, 601 Court St., Scott City, Kansas--Partnership--Kansas Howard T. Young, 911 Church St., Scott City, Kansas--Br. R. H. Spencer, 606 Russell St. Scott City, Kansas--Fred. M. Heino, Lucas, Kansas--Robert B. McNeely, 1417 So. Terrace Dr. Wichita, Kansas--Frank O. Morel, Aztec, New Mexico--10% Royalty Interest-- rs. Vilatie Hyde, Blue Water, New Mexico--5% Royalty Interest

(*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 2 2/3 Claims-Containing approximately 46 2/3 Acres located in the South Half (S½) of the Southeast Quarter (SE¼) Section Thirty (30) Township 13North; Range 9West; McKinley County, New Mexico

(*b*) State any mine name by which the property is known. None

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

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

(*e*) If you own the land, describe any liens or encumbrances on it None

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. Flat Top-Vilatie Hyde #1; Book 10; Miscelaneous Records; Page 287--Flat Top-Vilatie Hyde #2; Book 10 Miscelaneous Records; Page 288--Flat Top-Vilatie Hyde #3; Book 10 Miscellaneous Records; Page 289

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

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. None

(*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*) [illegible]e the mineral or minerals for which you wi[illegible] 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 6 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)? Yes

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

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated February 12th, 1953

Richard Vogt
(Applicant)

By

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

A. We have drilled a few test holes with a Wagon Drill on our Number One claim for exploration purposes. The enclosed map shows the location of these test holes.

C. Our claims are located just below the Limestone Outcrop in this area where Uranium has been found. The mineralization in this area seems to run in folds. In the drilling we have done we have found a very good thickness of limestone. There has been a considerable amount of Uranium mined on the South-west Quarter of Section Thirty, which is the same section our claims are located in. Our claims are located in a mineralized area and we feel that the prospects of having one or more bodies of uranium ore on our property are very favorable. We have picked up traces of mineralization in some of the test holes we have drilled. These test holes were checked with a Geiger Counter from the Atomic Energy Office located in Grants, New Mexico.

D. Section Thirty (30) Township 13 North, Range 9 West, may be reached by turning North on U.S. Highway #66 at the San Mateo Road. This road is approximately three (3) miles west of Grants, New Mexico. Then approximately eleven (11) miles north on the San Mateo Road which is State Road 63 and turning to the left through a fence gate.

It is approximately Sixteen miles (16) to the Anaconda Copper Company's buying station located at Bluewater, New Mexico, from our property.

The nearest supply point from our property is Grants, New Mexico, which is approximately Fourteen (14) miles.

E. We can secure the services of an individual who has his own Wagon Drill and necessary equipment and manpower to carry out this exploration project.

5

C. We would like to complete the drilling program which we have started on our property. Our plan is to drill test holes on one-hundred-foot centers over the entire property. In drilling these test holes we would like to drill test holes on ten to twenty five foot centers when we find a good show of mineralization, this making a thorough test of the mineralized area.

D. The Applicant has supervised the drilling work that has been done on this property to date, also the assessment work that was done for the year 1952. The Applicant has had experience in taking samples from the test holes as they are being drilled, also in testing the holes for mineralization with a Geiger Counter. He feels that he is capable of supervising this exploration work.

The Individual who will do the Wagon Drilling owns his own equipment and has had considerable in this line of work. He is capable and his work has been satisfactory. His equipment is in good working condition and large enough to drill test holes to a depth required to properly explore the property.

SUPPLEMENT TO APPLICATION FOR AID IN AN
EXPLORATION PROJECT

6

Estimate of Costs:

A. Wagon Drilling will cost approximately $1.25 per foot of drilling. Cost is based on drilling holes on one-hundred-foot centers, and allowing for extra holes to be drilled in Mineralized Areas.

Estimate of Cost----------$16,000.00

B. 1-Supervisor @ $25.00 per Day----------$ 2,500.00

C. Operating Materials & Supplies---------- None

D. Operating Equipment---------- None

E. Rehabilitation & Repairs---------- None

F. New Buildings, Improvements, Installations- None

G. Miscellaneous---------- None

H. Contingencies---------- $ 500.00

TOTAL ESTIMATED COST $19,000.00

Dated February 12th. 1953

Richard Vogt
(Applicant)

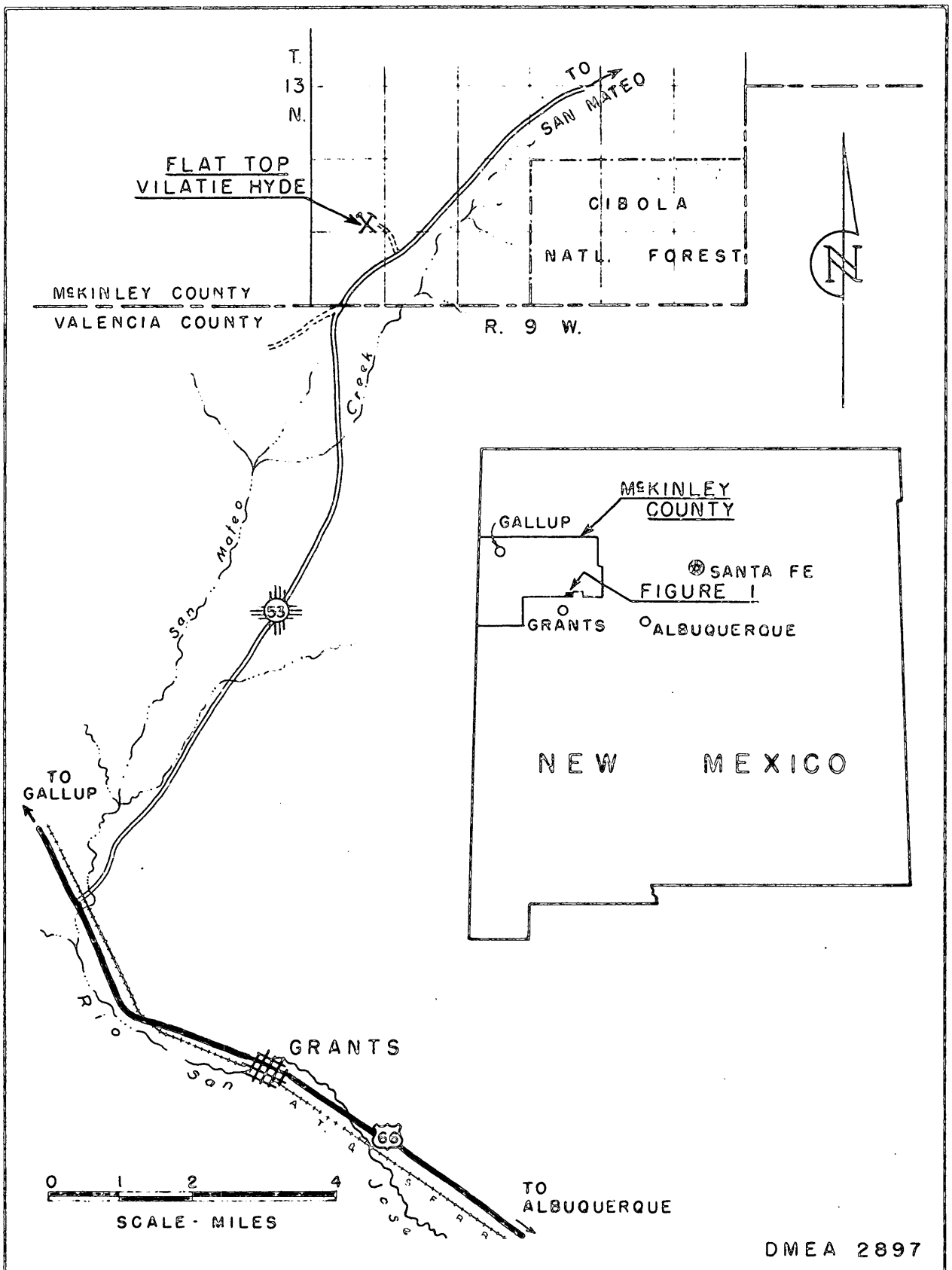
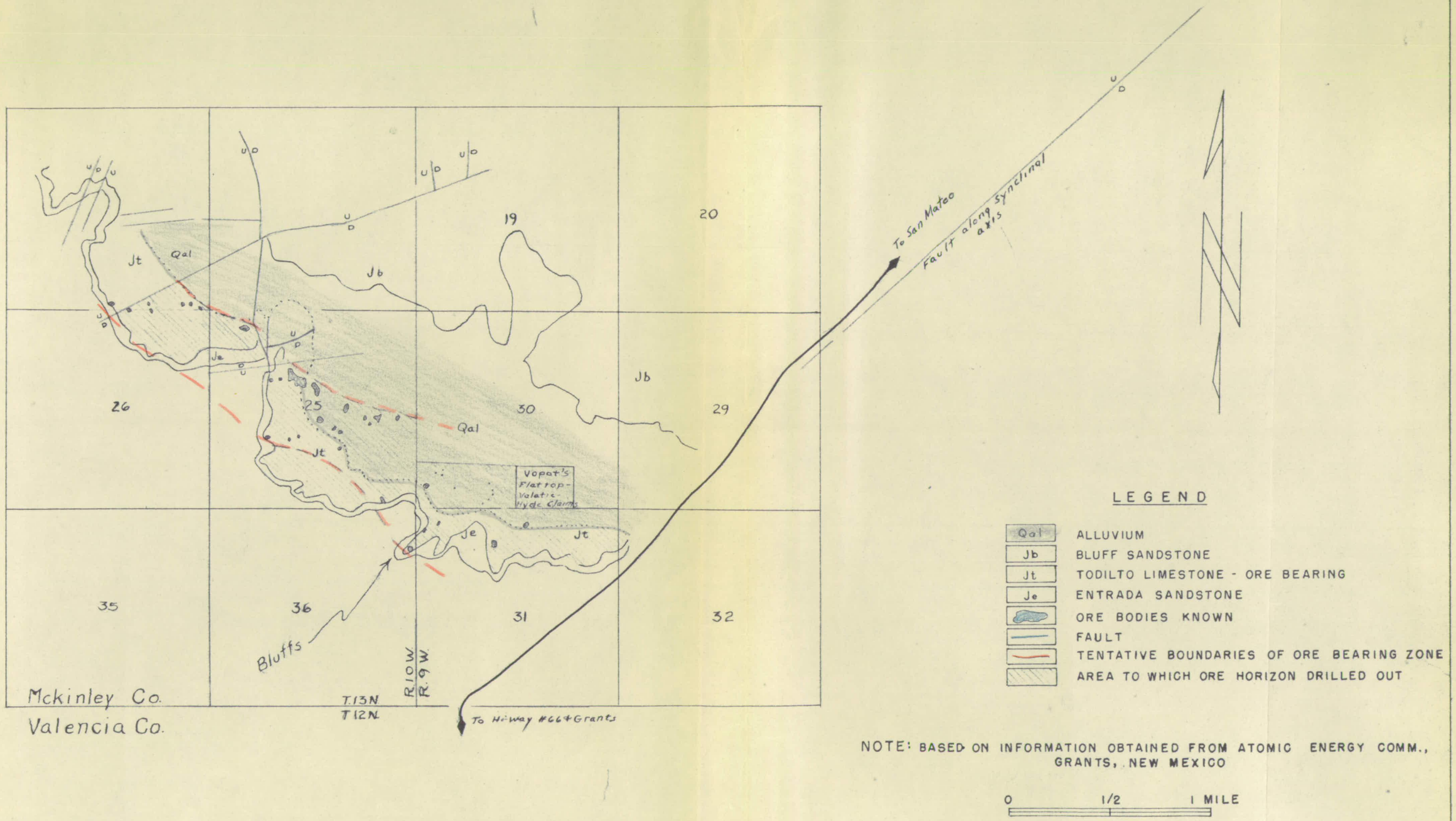
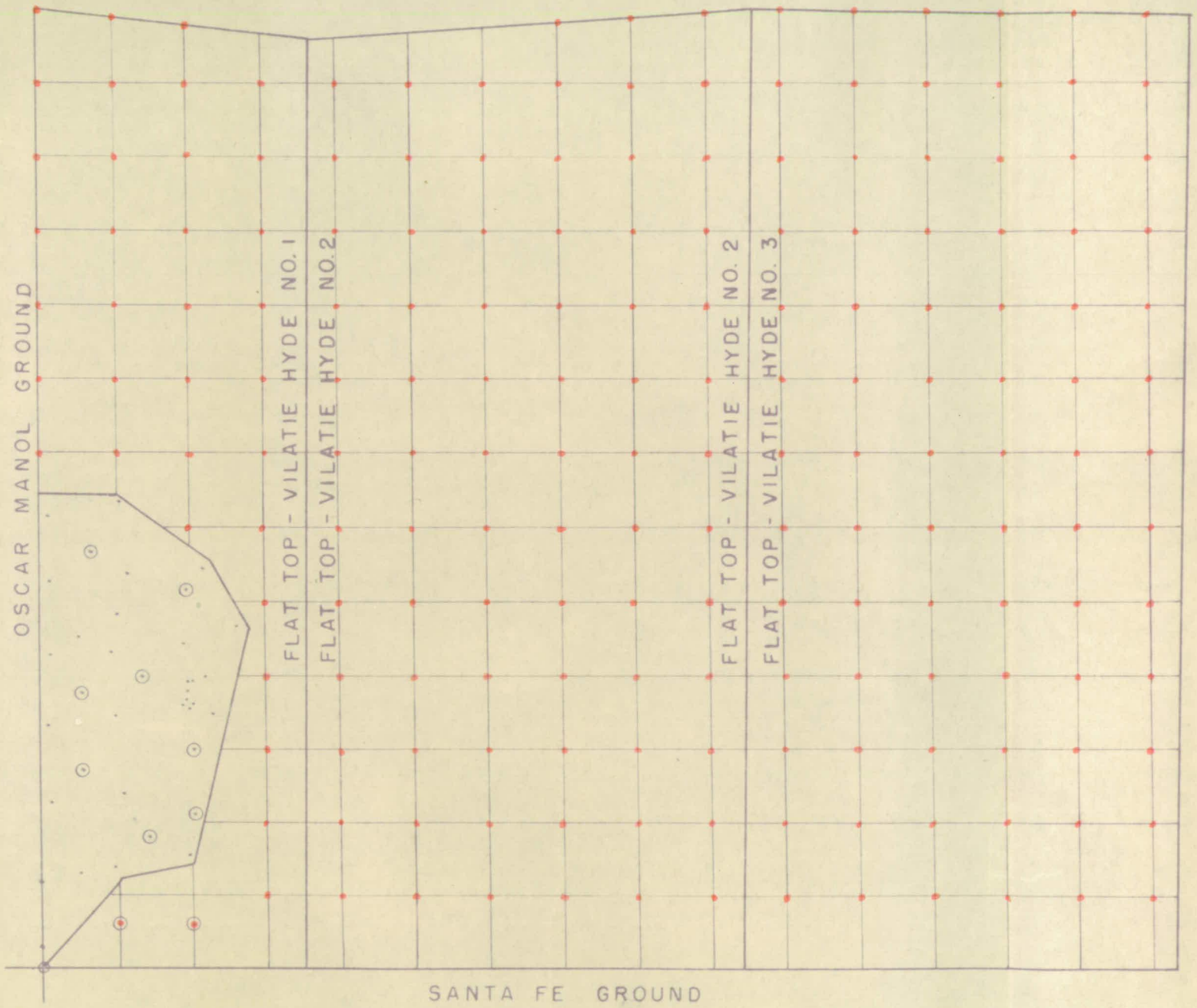


FIGURE 1. - LOCATION MAP - RICHARD VOPAT
FLAT TOP - VILATIE HYDE CLAIMS McKINLEY COUNTY, NEW MEXICO



DMEA 2897

FIGURE 1. - GEOLOGY OF PORTION OF GRANTS AREA IN VICINTY OF FLAT TOP-VILATIE HYDE CLAIMS
McKINLEY COUNTY, NEW MEXICO



LEGEND

· SITE OF WAGON DRILL HOLES BY VOPAT

⊙ SITE OF PRIMARY HOLES TO BE DRILLED OFF GRID PATTERN (8)

SITE OF PRIMARY HOLES ON GRID PATTERN (189)

CLAIM BOUNDARIES

AREA DRILLED BY VOPAT

0 100 200 400

SCALE-FEET

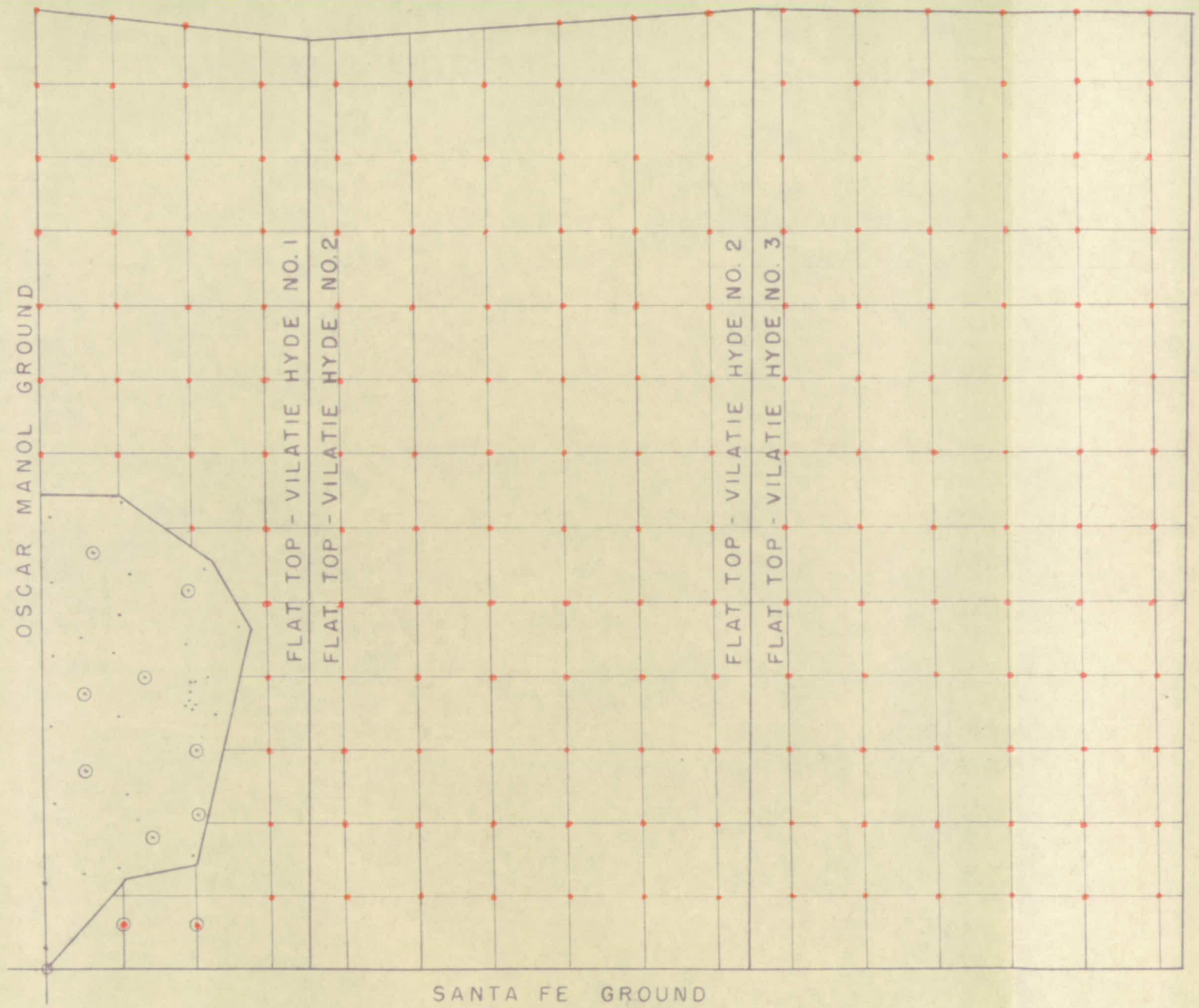
BASE AND CLAIM MAP FROM A E C.

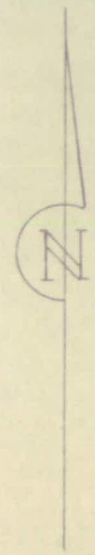
GRID PATTERN TO BE STARTED ON WEST SIDE LINE AND SOUTH END LINE OF CLAIMS.

DMEA 2897 (URANIUM)

FIGURE 2. - PROPOSED DRILLING ON FLAT TOP-VILATIE HYDE CLAIMS

~~GRANTS~~, McKINLEY COUNTY, NEW MEXICO





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- SITE OF PRIMARY HOLES ON GRID PATTERN (189)
- CLAIM BOUNDARIES
- AREA DRILLED BY VOPAT

0 100 200 400

SCALE- FEET

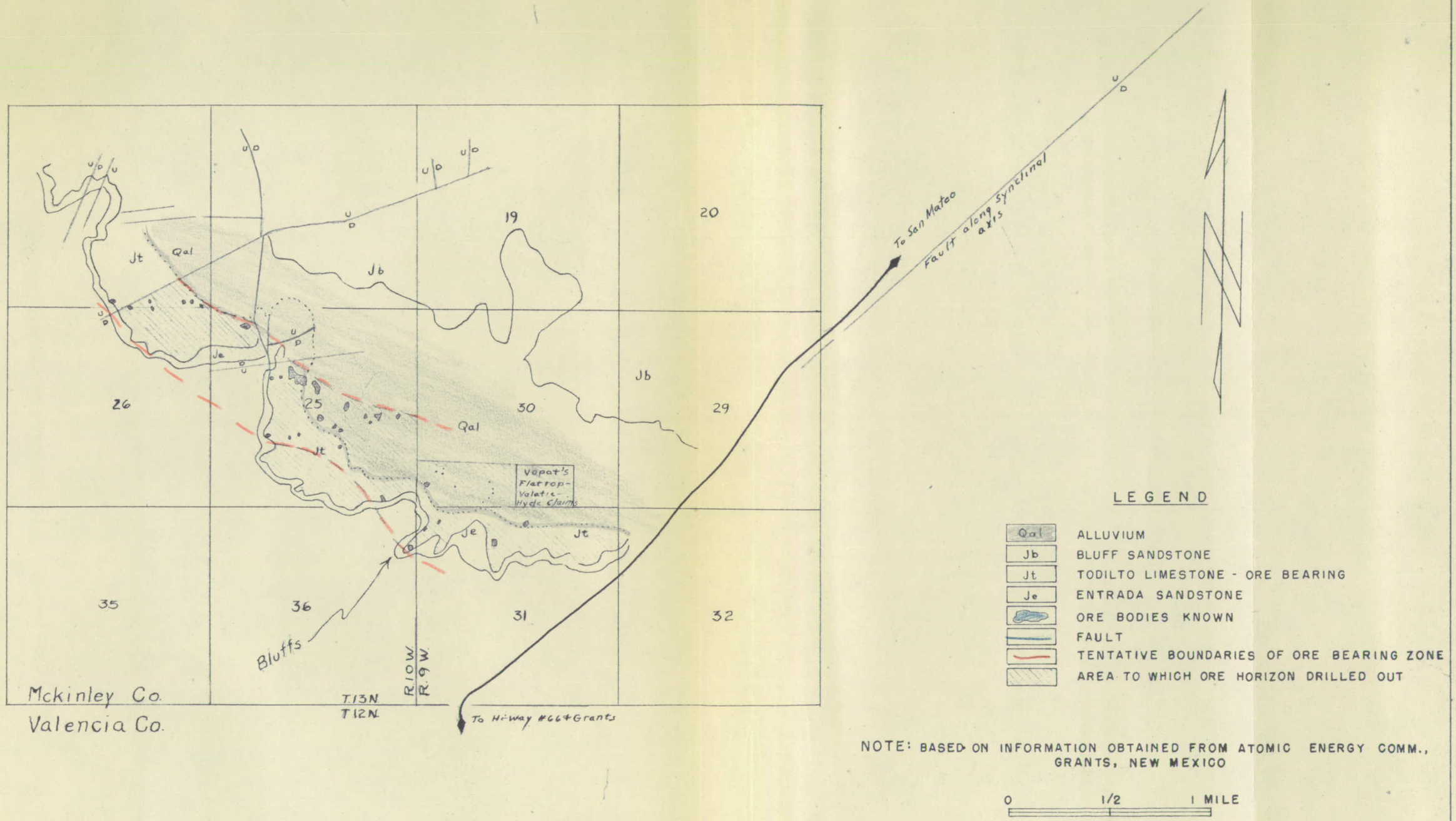
BASE AND CLAIM MAP FROM A E C.

GRID PATTERN TO BE STARTED ON WEST SIDE LINE AND SOUTH END LINE OF CLAIMS.

DMEA 2897 (URANIUM)

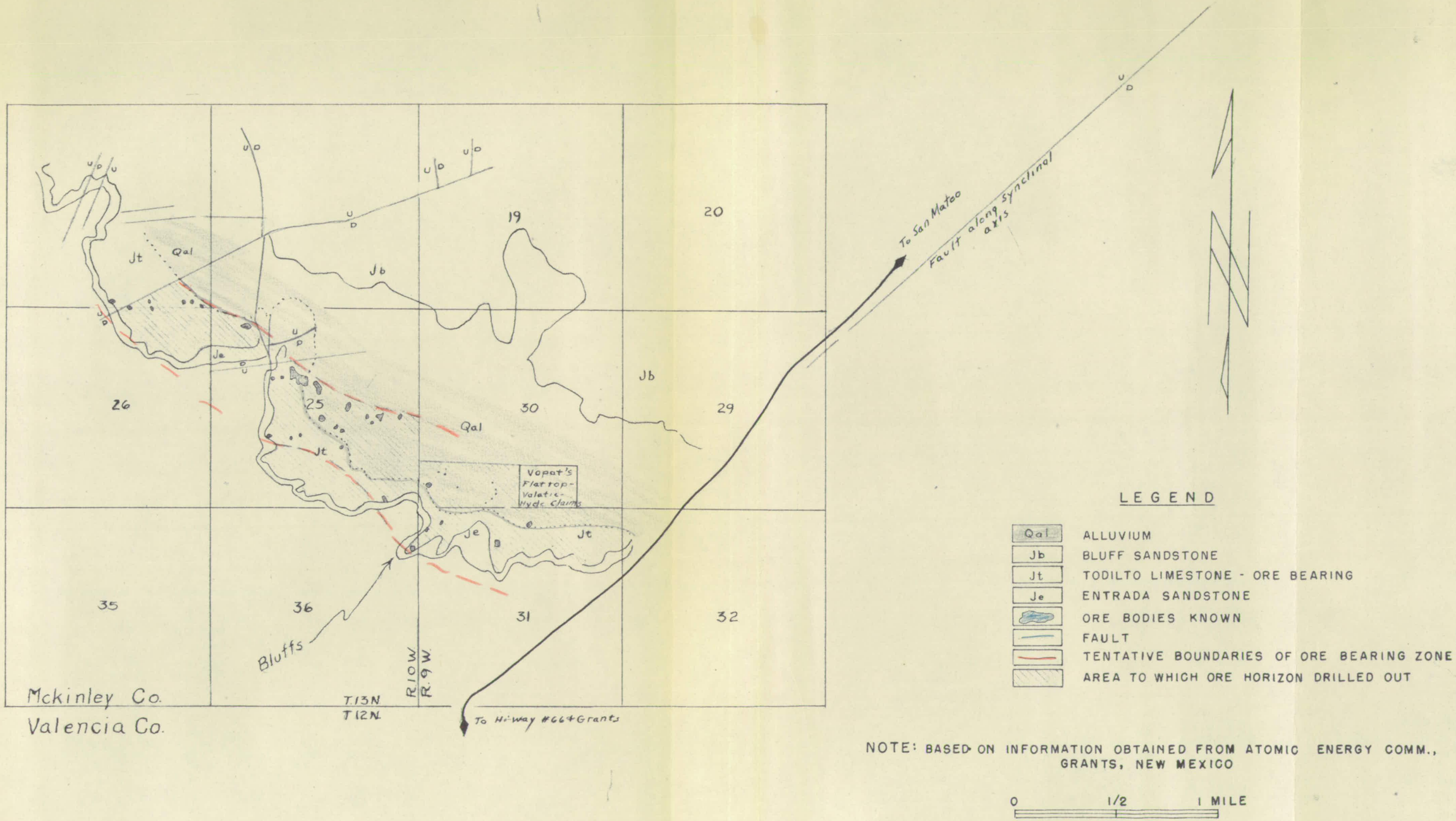
FIGURE 2. - PROPOSED DRILLING ON FLAT TOP - VILATIE HYDE CLAIMS

~~GRANTS,~~ MCKINLEY COUNTY, NEW MEXICO



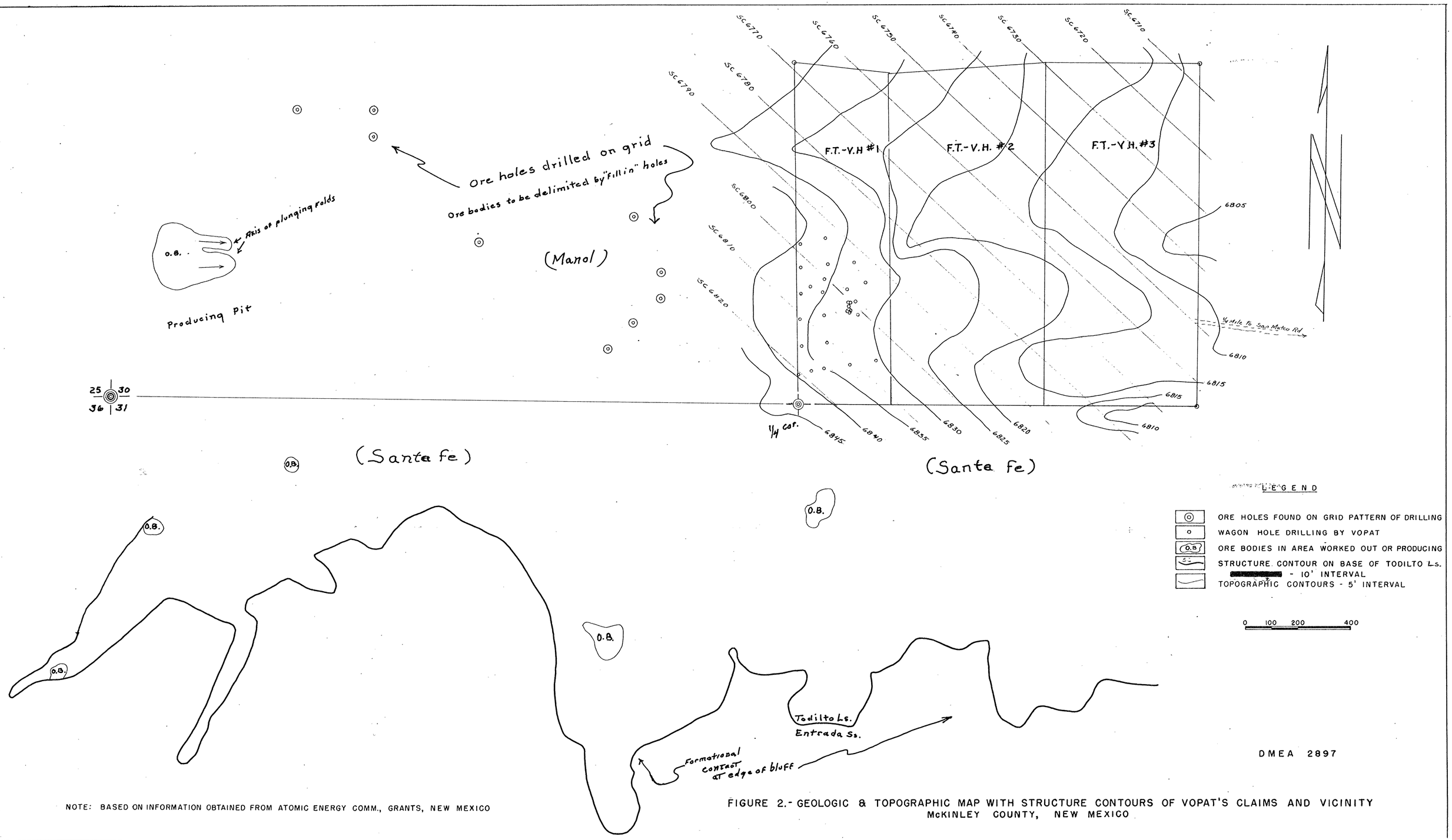
DMEA 2897

FIGURE 1. - GEOLOGY OF PORTION OF GRANTS AREA IN VICINTY OF FLAT TOP-VILATIE HYDE CLAIMS
McKINLEY COUNTY, NEW MEXICO



DMEA 2897

FIGURE 1. - GEOLOGY OF PORTION OF GRANTS AREA IN VICINTY OF FLAT TOP-VILATIE HYDE CLAIMS
McKINLEY COUNTY, NEW MEXICO



NOTE: BASED ON INFORMATION OBTAINED FROM ATOMIC ENERGY COMM., GRANTS, NEW MEXICO

FIGURE 2.- GEOLOGIC & TOPOGRAPHIC MAP WITH STRUCTURE CONTOURS OF VOPAT'S CLAIMS AND VICINITY
McKINLEY COUNTY, NEW MEXICO