MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

DMEA
DEPARTMENT OF THE INTERIOR
Form Approved.
Budget Bureau No. 42-R1035.2.

SEP 17 1956
REGION III
DENVER, COLORADO

Denied 1/11/57

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. 4471
Metal or Mineral U3O8
Date Received
Estimated Cost
Participation (Government %)

USGS Washington Survey Copy

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:

Chipeta Uranium Corporation
315 North Avenue
Grand Junction, Colorado

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

16—66551-1

See supplemental sheets for answers to the above and following questions.

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

.....

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

☑ Money ☑ Use of equipment owned by you ☑ Other Services

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 September 14, 1956

Chipeta Uranium Inc.
(Applicant)

By A. L. Thomas, President

Grand Junction, Colorado

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

September 10, 1956

Defense Minerals Exploration Administration
District Bureau of Mines
New Custom House
Denver, Colorado

Attention: Mr. Townsend

Dear Mr. Townsend:

I am forwarding you under separate cover an application for a DMEA loan on the mining claims we have in the Gateway Mining District of Mesa County, Colorado. You will also find in the enclosures four copies each of the Lease Agreement we have with B. B. Warren and Kanarado Mining Company respectively.

Should you need any additional information on this application please advise to my home address:

A. C. Thomas
1309 Glenwood Ave.
Grand Junction, Colorado

Very truly yours,

CHIPETA URANIUM INC.

By: A. C. Thomas, President

ACT:js

COPY

Chipeta Uranium Corporation
315 North Avenue
Grand Junction, Colorado

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

1 (a) The Corporation is known as The Chipeta Uranium Corporation
A. C. Thomas, President
Box 464 or 1309 Glenwood Avenue
Grand Junction, Colorado

Carmen Santy, Vice President
261 Ute Avenue
Grand Junction, Colorado

Tony Santy, Sec't. & Treas.
315 North Avenue
Grand Junction, Colorado

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SEP 12 1956
REGION III
DENVER, COLORADO

1 (b) Corporation papers dated July 19, 1955, recorded Aug. 13, 1955 11:26 A.M., number 644169 & 4513 are at the Mesa County Courthouse, Grand Junction, Colorado, are a matter of public record.

The Board of Directors are:

1 (c)	A. C. Thomas	C. H. Pierson
	Carmen Santy	Ben F. Hall
	Tony Santy	A. H. Minowitz
	R. N. Dunn	Fred Zanett

3 (a) The Claim group lies in T 50 N, R 18 W, sections 29, 32 and 33, and the south one-half of the Little Maverick No. 6 lies in T 49 N, R 17 W, Sec. 4, on the western point of Calamity Mesa, Juanita Arch Area, Mesa County, Colorado.

The claim group consists of the Little Mavericks 3, 4, 5 and 6 and Kanarado 1-6.

The proposed drilling program would be on the Kanarado 1-2, 4, 5, and 6, and the Little Maverick #6. Drilling should be confined to the west half of Kanarado 1 & 2 and most of Little Maverick #6 and the Kanarado 4, 5 and 6. (see claim map)

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Grand Junction, Colorado

3 (b) The property has been worked under the names of Little Maverick and Kanarado mining claims and ore has been shipped under these names.

The Kanarado 1-6 and Little Maverick 3, 4, 5 and 6 are certified and there is a remaining eligible balance of 9656.67 pounds of uranium.

3 (c) The Little Maverick 3 & 6 and Karanado 3, 4, 5, and 6 claims are held by rights of lease. The mining rights are held by the Chipeta Uranium Corporation. A copy of the original leases to Chipeta Uranium Corp. are included as exhibits under 3 (d) below.

3d The photostatic copies of the lease accompany this report. See attached photostats, Exhibits A - B.

3e There are no known liens or encumberances on the property.

3f The following is recorded in the Mesa County Courthouse, Grand Junction, Colorado.

Claim	Loc. Date	Rec. Date	Book	Page
Kanarado 1	6/18/51	8/4/51	551	421
Kanarado 2	6/18/51	8/4/51	551	422
Kanarado 3	6/18/51	8/4/51	551	423
Kanarado 4	6/18/51	8/4/51	551	424
Kanarado 5	6/18/51	8/4/51	551	425
Kanarado 6	6/18/51	8/4/51	551	426

Located by Kanarado Mining Co. by C. T. Vashus et al.

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Grand Junction, Colorado

Claim	Loc. Date	Rec. Date	Book	Page
Little Maverick 3	7/8/40	10/8/40	393	46
Little Maverick 4	7/8/40	10/8/40	393	46
Little Maverick 5	7/8/40	10/8/40	393	47
Little Maverick 6	7/8/40	10/8/40	393	47

Located by John Wade, Ernest Hoover, Rex Barton, O. L. Vowell.

4a Exploration drilling has been done on the north end of the group. Seventy-three holes have been drilled, (see map of claims) thirty-two have shown mineralization up to 0.10% U_3O_8 equivalent and 10 holes show 0.10 to 0.19% U_3O_8. The ore shows were also chemically analyzed. Three holes have been drilled on the claims which are to be considered on this exploration drilling program. Some ore has been shipped from a short adit on the Maverick No. 6, but figures are not available except from the Finance Division of the A.E.C. as the lessees can not be located, but this information is accessible to a D.M.E.A. team.

The drilling was done by the Chipeta Uranium Corporation but the mining was done some years in the past.

All mine workings are accessible.

4b There is no current production and no known ore reserves at present. The ore shipped was of commercial grade.

4c The ten claims lie on Salt Wash member of the Jurassic Morrison formation with the north one quarter of the Kanarado 4, 5 and 6 extending

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Grand Junction, Colorado

up onto the Brushy Basin member of the Morrison. All of the Kanarado #2 and 2/3 of the Little Maverick #6 also extending up onto the Brushy Basin member of the Morrison. These are the claims which we propose to include in the application for the D.M.E.A. exploration loan, and exclude the claims on the northwest end which have already been drilled. (see accompanying map).

The mineralization is carnotite-vanadium type deposit, and these have been important.

All known uranium-vanadium deposits in this area are in the Morrison formation. Most of the deposits are in the uppermost sandstone stratum of the Salt Wash sandstone member, scattered deposits are known in the conglomeratic sandstone lenses at the base of the Brushy Basin shale member. Ore grade mineralization has been found on this property in the top and middle stratum of the Salt Wash member.

In general the ore minerals are deposited in irregular layers that roughly follow the sandstone beds. In most deposits the highest grade concentrations of ore minerals occur in sharply bounded, elongated concretionary structures, called "rolls". Within these rolls this mineral generally is distributed as diffusion layers, the richer layers commonly lying near the margins of the rolls.

Although many rolls are small and irregular, the larger rolls are elongate and may extend with little change of direction for more than 100 feet. The elongate rolls in an ore body or group of ore bodies in

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a given area generally have a common orientation. This orientation is roughly parallel to the elongation of the ore bodies.

Cross bedded, relatively coarse grained sandstone is more favorable than thinly or evenly bedded, fine-grained sandstone. Sandstone that contains considerable amounts of gray, altered mudstone, or underlain by a considerable thickness of this rock, is most favorable--this guide is perhaps the most useful in diamond-drill exploration.

In this area the ground underlain by the Salt Wash sandstone member of the Morrison formation that appears to be the most favorable for the occurance of uranium-vanadium ore is Flat Top Mesa and along the eastern edge of the quadrangle near the Maverick Mines and the area just south of Little Maverick canyon. (see quadrangle map) There are numerous mines just north of this property and in the same formations and the same identical geology. The tip of Calamity Mesa has not been extensively explored by drilling as yet, and several rim shows have been mined and produced commercial ore.

Calamity Mesa to the east has numerous good mines in these same Salt Wash members and Numont Mining Co. has a very extensive ore "roll" about one mile east of this property in similar geologic formations.

"Deposits have been discovered recently and worked on Calamity Mesa south of Little Maverick canyon, and deposits in the Brushy Basin member have been prospected, one near the head of Cave canyon". (exerpt from Geology of the Juanita Arch Quadrangle, Colorado, by Eugene M. Shoemaker).

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The Depression mines, on the northwest side of Flat Top Mesa, are developed in a group of blanketlike ore bodies 100 to 300 feet across. The ore lays in layers up to 2 feet thick. Rolls are moderately developed. This also has the same geology as the western tip of Calamity Mesa and these claims for which application is being made.

4d The property is easily accessible on a good access road. The property is 14 miles past the Arrowhead Mine owned by Climax Uranium Co. which makes a 79 mile ore haul to the Climax mill. The same distance to supply points in Grand Junction and a trailer house provides living quarters for the drill crew on the property.

4e Man power will be provided by Chipeta Uranium Corp. Material and supplies are available at Grand Junction. Water is available 7 miles from the property for both domestic and drilling purposes.

5a This proposal is for the exploration of uranium-vanadium ores characteristic to this area.

5b AN EXPLORATION PROGRAM FOR THE LITTLE MAVERICK 6 AND KANARADO 1 - 6 MINING CLAIMS, CALAMITY MESA, JUANITA ARCH AREA, MESA COUNTY, COLORADO

We propose to drill and explore the middle rim of the Salt Wash as no known bottom rim deposits have been discovered in this area. The depth from the top of the Salt Wash thru the middle rim is assumed to be about 150 feet and 300 feet assumed from top of Brushy Basin. Plus or minus footage could be compensated by more or less holes as drilling progresses.

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The proposal is to divide the drilling program in two stages, stage #1 with approximately 8100 feet of drilling and stage #2 of 1900 feet of drilling to be used for off-set holes on ore hole discoveries.

Stage #1 is to be comprised of three groups of holes on 200' centers beginning at the southeast corner of Kanarado #6 and extending due eastward five holes, then the second row of holes 200' north extending due east-west but offset 100' west so the fence has a tendency to cover the ground more thoroughly than a square grid would. This group is composed of eleven (11) holes with an approximate 1800 feet of drilling.

The second group is 400 feet north of group 1 and the first hole of the bottom line is due north of the first hole of group 1. The same grid is used for 13 holes with a drilling footage of 3000 feet.

Group 3 is 400 feet north of group 2, same grid with 12 holes for a drilling footage of 3300 feet.

The remaining 1900 feet could be used to offset ore holes or for the extension of the grids should drilling warrant. (see claim map)

Geologically as well as structerally this property is similar to the geology and structure of Flat Top Mesa, the area east of Maverick canyon and the rest of Calamity Mesa, all three of which have good producing mines. This property is surrounded by producing properties

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Grand Junction, Colorado

and has indications of ore on outcrops, has produced some ore and is very definitely worthy of a drilling program.

Location

The claims are 79 miles from Grand Junction, Colorado and the Climax Mill. The property is reached by traveling 9 miles southeast to Whitewater then southwest toward Gateway to the end of the black-topped pavement at Taylors Ranch, then left over the Uncompahgre road to Calamity Mesa, continue on 14 miles past the Arrowhead Mine of Climax Uranium to the property on the western tip of Calamity Mesa.

Grand Junction is the mining center for this area. Numerous firms stock mining and drilling supplies. Sufficient mining or drilling labor may be secured in Grand Junction as well as operational supplies.

History and Production

This ground was located for uranium-vanadium and five small adit operations have been worked on rim exposures. The tonnage and grade figures are available only thru the shipper or the Finance Division of the Atomic Energy Commission. The lessee personal are unable to be located, but the Finance Division will give these figures to a duly qualified D.M.E.A. team.

The Kanarado 1 - 6 and Little Maverick 3, 4, 5 & 6 have a remaining certification bonus payment on 10,000 pounds of 9656.67 pounds of uranium.

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Grand Junction, Colorado

With a supposed average of 0.20% U_3O_8 this would mean at least 100 tons of ore shipped of commercial grade.

The Chipeta Uranium Corporation has drilled approximately 500 feet of exploratory drill holes on the north end of the group but now desire a D.M.E.A. loan to explore the Brushy Basin-Salt Wash members of the Morrison, on the south and east end of the group.

The claims were reported to have been surveyed by Melbye & Rudd of Holden, Colorado.

Claims

There are ten claims in this group in T 50 N, R 18 W, Sections 29, 32, 33 and T 49 N, R 17 W, Section 4, on the western tip of Calamity Mesa, Juanita Arch Area, Mesa County, Colorado.

The claims are recorded in the Mesa County Courthouse, Grand Junction, Colorado.

Ore Reserves

Blocked out ore is non-existant except for some narrow exposures in the adits.

Geology

The ten claims lie on Salt Wash member of the Jurassic Morrison formation with the north one quarter of the Kanarado 4, 5 and 6 extending

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up onto the Brushy Basin member of the Morrison. All of the Kanarado #2, 4, 5 & 6 and 3/4 of the Kanarado #1 and 2/3 of the Little Maverick #6 also extending up onto the Brushy Basin member. These are the claims which we propose to include in the application for the D.M.E.A. exploration loan, and exclude the claims on the northwest end which have already been drilled. (see accompanying map)

The mineralization is carnotite-vanadium type deposit, and these have been important.

All known uranium-vanadium deposits in this area are in the Morrison formation. Most of the deposits are in the middle and top sandstone stratum of the Salt Wash sandstone member, scattered deposits are known in the conglomeratic sandstone lenses at the base of the Brushy Basin shale member. Ore grade mineralization has been found on this property in the top and middle stratum of the Salt Wash member.

The Salt Wash member crops out above the slope forming Summerville formation as a series of thick, resistant ledges and benches of which there are three such ledges on this property. Sandstone predominates and ranges in color from nearly white to gray, light buff, and rusty red. Sandstone commonly occurs as strata traceable as ledges for considerable distances along the outcrop, but within each stratum individual beds are lenticular and discontinuous; beds wedge out laterally, and other beds occupying essentially the same stratigraphic position wedge in. Thus any relative continuous sandstone stratum ordinarily consists of numerous

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interfingering lenses, with superposed lenses in many places filling channels carved in underlying beds.

Ripple marks, current lineation, rill marks, and cut and fill structures indicate the Salt Wash was deposited under fluvial conditions. The Salt Wash is about 200 feet thick in this particular area.

The Brushy Basin shale member contrasts strongly in overall appearance with the Salt Wash, but the contact between the two members is gradational.

The Brushy Basin shale member consists predominantly of vari-colored bentonitic shale and mudstone, with intercalated beds and lenses of conglomerate and sandstone, and a few thin layers of limestone. Beds of chert pebble conglomerate a few inches to 25 feet thick occur at intervals throughout the member.

The Brushy Basin at this particular location is approximately 200 feet thick.

The general elevation is about 6100 feet above sea level.

Two ore horizons have rim ore exposures on this property with five adit operations already worked and numerous other exposures along the rims.

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Cost Estimates:

Basis

10,000 ft. drilling @ 150' per day	67 days
67 days at 26 working days	2 1/2 months

Drilling costs:

10,000 feet of drilling		
5000 feet plug bit	@ $1.25	6,250.00
5000 feet core	@ 2.50	12,500.00
		18,750.00

Road work

Drill roads and drill sites $3000.00

5c The work will start within 15 days and be completed within two and one-half months from the date of an exploration project contract.

5d The Personal record of Mr. J. M. Harlan is attached and he will supervise the operation.

6a There will be no independent contract work.

6b The labor will consist of:

1 Engineering & Geological Consultant		$500.00 per month
$500.00 x 2½ months	Total	$1250.00

6c Operating materials and supplies:

Gas for engineers car	$50.00	
Oil for engineers car	5.00	
Upkeep for engineers car	20.00	
	$75.00 per month	
$75.00 x 2½ months	$187.50	Total

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315 North Avenue
Grand Junction, Colorado

6d Operating equipment:

This equipment is now owned by the Chipeta Uranium Corporation, and will be used on the drilling program.

1 1955 Willys 4 wheel drive pick-up	2507.00
1 Bon Ton Trailerhouse	600.00
	3107.00

6e Rehabilitation and repairs:

There is no rehabilitation or repairs to be made on any of the buildings, installations, fixtures or moveable operating equipment, now owned by Operator which will be devoted to the exploration project.

6f No new buildings, improvements or installations are necessary for the exploration project.

6g Miscellaneous:

Accounting $25.00 per month @ 2½ months		$ 62.50
workmen compensation		
employers liability insurance	total	
payroll taxes	20,000 @ 6%	1200.00
		$1262.50

The $1200.00 will be borne by the drilling company

6h No contingencies

7a We are prepared to furnish our share of the cost of the proposed project in accordance with the regulations on Government participation. (Sec. 7, D.M.E.A. No. 1)

7b See application sheet

PERSONAL HISTORY

Jack M. Harlan
Registered Professional Engineer of Colorado, #2527

Born in Butte, Montana, May 13, 1913, married and have three children.
Reside at 1060 Grand Avenue, Grand Junction, Colorado, phone 4893.
Had 4 years at Montana School of Mines in Mining Engineering and Mining Geology, and 20 years of experience in the mineral industries in uranium, copper, lead, zinc, manganese, chrome and oil. Experienced in exploration and production of the metals both underground, and by open pit methods and petroleum exploration.

PROFESSIONAL RECORD

(1) "Q" Security clearance from the Federal Bureau of Investigation, for the Atomic Energy Commission. The "Q" group is the highest security group for loyalty, honesty, and integrity granted by the Federal Government.

(2) May, 1955 to present - 10 months as an independent Professional Mining and Geological Consulting Engineer, Colorado #2527. Such work included mine evaluation, geological evaluation, mine management and exploration with the reports and maps required as a Professional Consultant.

(3) Jan. 1952-May 1955 - 2½ years United States Atomic Energy Commission, six months of exploration and two years in the Mining Division. This work consisted of geological as well as mine evaluation, and as District Engineer for the area of Colorado, Utah, Nevada and California, and northern Arizona and New Mexico. I was responsible for all information on prospecting, mining, geology and production records in this area, and coordinator between the producers and the A.E.C.

(4) Jan. 1951-Jan. 1952 - 1 year with Kennecott Copper Corporation, as Mining Engineer in the open pit operations at Santa Rita, New Mexico. This work entailed the engineering of the open pit operations, laying out of highways, railroads and during this period the layout of a new town-site as the pit

operations required the removal of the old town.

(5) 1950-1951 - 1 year U. S. Bureau of Mines, Region 7, in North and South Carolina, Tennessee, Georgia, Mississippi and Florida. This work consisted of mining and geological evaluation and examination of all minerals in this area, and advisory suggestions for operation and exploration to the operators and prospectors with reports to the U. S. Bureau of Mines.

(6) 1944-1950 - 6 years Continental Oil Co., Petroleum Exploration, Oil Geology and Geophysics. This time was divided into Seismic Operator, Computer, and Chief of Party. The work consisted of structural mapping and interpretation, and the management of field crews in the field of Petroleum Exploration.

(7) 1936-1944 - 8 years Anaconda Copper Mining Co., Butte, Montana. The work was divided into several phases as it was the first practical application of the technical education.

1 Contract miner in drifts, raises and stopes.

2 Sampling proceedures and ore reserve calculations.

3 Mining Engineering.

4 Mining Engineering Research Department on improving underground mining methods, improved drilling methods, problems in service and ore haulage, and other problems in mining.

5 Supervisor of "On-The-Job" instructions for miners (during the war) when the armed forces released 2000 men to the A.C.M. to be trained in underground copper mining.

6 Production management. Shift boss over a portion of the mine and shaft boss. This work entailed the direction of about 40 contract miners in the mining of copper ores.

April 28, 1956
1060 Grand Avenue
Grand Junction, Colorado

DMEA
OF THE INTERIOR
1956
III
COLORADO

Mr. A. C. Thomas, President
Chipeta Uranium Corporation
315 North Avenue
Grand Junction, Colorado

Dear Mr. Thomas:

Enclosed is the D.M.E.A. application and proposal for the Chipeta Uranium Corporation on the Kanarado 1 - 6 and Little Maverick #6, Calamity Mesa, Juanita Arch Area, Mesa County, Colorado.

The total estimate for the proposal is $23,250.00

Basis:

10,000 drilling @ 150' per day	67 days
67 days at 26 working days	2½ months

Drilling:

10,000 feet

5000 feet plug bit @ 1.25	$ 6250.00
5000 feet core drill @ 2.50	12500.00
	$18750.00

Road work:

Drill roads & sites 36 holes $3000.00

Engineering:

1 Engineer & Consultant @ $500.00 per month $1250.00

Operating & Supplies:

Engineers car -

gas	50.00	per month x 2½ months	$125.00
oil	5.00	" " " " "	12.50
upkeep	20.00	" " " " "	50.00
			$187.50

Miscellaneous:

Accounting $25.00 per month	@ 2½ months	$ 62.50
Workman compensation		
Employers liability insurance		
Payroll taxes	$20,000 @ 6%	1200.00

This $1200.00 would be borne by contract drilling company.

Total cost:

Drilling	$18,750.00
Road work	3,000.00
Engineering	1,250.00
Engineering expenses	187.50
Accounting	62.50
	$23,250.00

Bids for the drilling should be called for when the application is accepted by the D.M.E.A.

Respectfully submitted,

Jack M Harlan

JMH/bh

Jack M. Harlan
Registered Professional Engineer
and Consultant
Colo. #2527

LEASE AGREEMENT

THIS AGREEMENT, Made and entered into this 18th day of May, A. D. 1956, by and between KANARADO MINING & DEVELOPMENT COMPANY of Ohio City, Colorado, hereinafter called Lessor, and CHIPETA URANIUM COMPANY, Inc., of Grand Junction, Colorado, hereinafter called Lessee, WITNESSETH:

WHEREAS, Lessor is owner in full interest of certain unpatented mining claims staked and recorded as Kanardo Mining Claims Nos. 1 to 6 both inclusive and are owners of three-fourths (3/4) interest in Little Maverick Claims Nos. 3 and 6, all situate in the Gateway Mining District of Mesa County, Colorado, and

WHEREAS, It is the mutual wish and desire of the lessor and lessee hereto that the lessor lease the above described mining claims of full and complete interest to the lessee, and also that the lessor lease their three-fourths interest of the said Little Maverick Claims Nos. 3 and 6 to the lessee for a period of three (3) years beginning May 1, 1956 and ending May 1, 1959, and subject to the agreements and covenants herein contained, and hereafter stated;

NOW, THEREFORE, In consideration of the premises and mutual covenants and agreements herein contained, IT IS MUTUALLY COVENANTED AND AGREED as follows, to-wit:

1. That the lessor hereto for and in consideration of the royalties and bonuses hereinafter reserved does hereby lease unto the lessee the above described mining claims of full and

This brochure is about a copy of the lease from B.V. Warren to Chipeta Uranium, Inc.
Amc 9-17-56

partial interest for a period of three years beginning on May 1, 1956 and ending May 1, 1959, subject, however, to the renewal clause hereinafter stated.

2. That the lessee hereby agrees to pay to the lessor as royalty fifteen per cent (15) of the value of all ores extracted from said premises, and, or of all monies received from the sale of such ores produced and sold. The lessee agrees to ship said ores or deliver same to some regular ore buyer, and to instruct said buyer, or buyers, to pay to lessor the percentage as royalty as hereinabove stated, and as per the interest held by the lessor in the said above described properties.

3. The lessee further agrees to pay to the lessor one-third (1/3) or thirty-three and one-third (33 1/3) per cent of any and all bonus payments received by the lessee from any source during the life of this lease.

4. Lessee agrees to enter upon said mining claims within fifteen (15) days from the date of this lease, and to perform or cause, or have performed at lease forty (40) eight hour shifts of mining labor per month, such performance to be in a good mining fashion, in a manner necessary to good and economical mining, with due regard to the development and preservation of said mine or mining properties as a workable mining property, and to the special covenants herein contained. Lessee agrees to perform said forty shifts of mining each and every month during the life of this lease, unless prevented by actions of the elements or causes beyond the control of the lessee.

5. Should lessee, in connection with or in any way relating to the mining of said claims, employ over three (3) men, the lessee shall carry workmen's compensation insurance upon all employees, or sub-lessee's in or about said mining claims, and shall pay promptly all bills for labor and materials incurred in it's

operation hereunder, and shall pay Social Security Taxes and other taxes which may be imposed upon it in carrying on operations, and shall post the property in the usual manner to advise the public of the fact that such operations are being conducted by the lessee and that the lessor will not be responsible therefor.

6. Lessee shall keep accurate accounts or records, of the ore produced and sold from said mining properties, and furnish the lessor or his agent with duplicate settlement sheets of all ores sold. Such records shall be open to the inspection by the duly authorized agent or attorney of the lessor, together with lessee's records of geological data and log of said work done in said development of said claims.

7. The lessee further agrees to allow the lessor or his agents from time to time to enter upon and into allportions of said mines for inspection, probing and checking of work done on said properties.

8. The lessee agrees to not transfer this lease to any other lessee without written consent of the lessor herein. In the event lessee shall fail, refuse or neglect to perform any of its promises and covenants herein contained, lessor shall have the right to rescind and terminate this contract by giving notice to terminate this contract by registered mail, with the same to become effective thirty (30) days from and after the date of the mailing of the said notice. Within the period of thirty days the lessee may remove the defaults mentioned in said notice and thereupon this contract shall be fully reinstated, but should should it fail to remove the said defaults within said period this contract shall be considered as rescinded and of no further force and effect, and the lessee shall have the right to remove all of its owned or leased or rented equipment other than that owned by the lessor.

9. IT IS MUTUALLY AGREED between the lessee and lessor hereto that time is of the essence of this agreement, and upon failure of the lessee to make any one or more of said royalty payments, or perform any of the covenants and agreements herein contained to be kept and performed by it, this agreement may be terminated at the election of the lessor upon giving lessee thirty days written notice of his intention so to do, as hereinabove provided, and in the event of such termination, all payments theretofore made by lessee to lessor shall be kept and retained by lessor in full satisfaction and liquidation of all damages lessor may have sustained by breach of this agreement and by way of rental, and upon such termination, lessor shall have the right to re-enter and take immediate possession of said properties.

10. IT IS FURTHER MUTUALLY UNDERSTOOD AND AGREED that the lessee is hereby granted the option to renew this lease for a further term of three (3) years from and after May 1, 1959 upon giving to lessor thirty (30) days notice of intention so to do prior to the end of the primary term.

11. Lessor agrees that lessee may obtain a D.M.E.A. loan in connection with mining operations to be carried on by lessee hereunder and agrees to cooperate fully with lessee in the obtaining of such loan.

12. IT IS FINALLY AGREED That each and all covenants and agreements herein contained shall be binding upon, and inure to the benefit of the heirs, executors, administrators, successors and assigns of the parties hereto.

IN WITNESS WHEREOF The parties hereto have executed this lease the day and year first above written.

KANAPADO MINING & DEVELOPMENT COMPANY

By _____ President

ATTEST:

_____
Acting - Secretary

CHIPETA URANIUM COMPANY, Inc.

By A. C. Thomas President

ATTEST:

_____
Secretary

Mr. Selfridge
Mr. Ebeling

DRAFT

Suggest letter closing these claims.

Mr. A. C. Thomas
President, Chipeta Uranium Corporation
1309 Glenwood Avenue
Grand Junction, Colorado

Re: Docket No. DMEA-4471 (Uranium)
Kanarado and Little Maverick Claims
Mesa County, Colorado

Dear Mr. Thomas:

Your request under date of January 4, 1957, that a field examination of your property be made before refusing to grant financial assistance for your proposed project has been carefully considered.

I have had a review made of your application and of all the information we have available on your property and the surrounding area. Information gathered over a period of 15 years, including the results of considerable drilling by other Government agencies in the Calamity Mesa area, and reports on six DMEA field examinations in the same vicinity, indicate that this area is unfavorable for the discovery of significant deposits of uranium ore.

A field examination of your property would not add any new information, and therefore, is not justified. However, if you do any further work on your property, or can submit new evidence that would indicate the possibility of finding significant uranium ore deposits on your property, we would be glad to give further consideration to your request.

Sincerely yours,

Administrator

FEJ:ms 1/10/57

DEFENSE MINERALS ADMINISTRATION

97021

PRODUCTION EXPANSION DIVISION

LOAN APPLICATIONS

Name of Company and Address _____

Name of Mine and Location _____

Docket No. DMA - _____ Date received by P.E.D. _____

Metals or Minerals involved _____

Amount of loan and interest rate _____

Type of Loan (R.F.C. or Guaranteed Bank Loan) _____

Term of Loan _____

Purpose of Loan — Mine Equipment _____

Mill or Reduction Plant _____

Operating Funds _____

Other _____

Repayment and Rate _____

Comments on Contract: _____

_____

_____

_____

_____

Date sent to Legal Division: _____

Date of Recommendation to D.P.A. for Certification _____

Date Certification sent to R.F.C. by D.P.A. _____

Date Signed into Contract by R.F.C. _____

Additional Remarks: _____

_____

_____

_____

_____

Interior—Duplicating Section, Washington, D. C.

Signed _____

DMEA Form 7
(12-56)

700

OFFICIAL FILE COPY

Date	Surname	Code
1/10/57	Ching	700
1-11	Ellis	700
	[illegible]	130
1/11	Selfridge	130
		~~100~~
1/14	Cav	225

JAN 11 1957

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

Re: Docket No. DMEA-4471 (Uranium)
Chipeta Uranium Corporation
Kanarado and Little Maverick Claims
Mesa County, Colorado

Dear Mr. Traver:

For your information, we are enclosing two copies each of a letter, dated January 4, 1957, from Chipeta Uranium Inc. and the Administrator's reply.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

Enclosures

APPROVED:

Frank D. Lamb

Member, Bureau of Mines

Thor H. Kiilsgaard

Member, Geological Survey

MChing/gla
1-10-57
cc to: Admr.'s Reading File
Operating Committee
Code 700
Mr. Ching
Messrs. JECrawford, 3643
THKiilsgaard, 5224
JOHosted, 3210, GSA

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
1/10/57	Ching	700
1-11	Ellis	700
	FEJohnson	110
1/11	Selfridge	130
		~~100~~
		225

JAN 11 1957

Mr. A. C. Thomas
President, Chipeta Uranium Corporation
1309 Glenwood Avenue
Grand Junction, Colorado

Re: Docket No. DMEA-4471 (Uranium)
Kanarado and Little Maverick Claims
Mesa County, Colorado

Kilsgaard
Lamb

Dear Mr. Thomas:

Your request under date of January 4, 1957, that a field examination be made before refusing to grant financial assistance for your proposed project has been carefully considered.

I have had a review made of your application and of all the information we have available on your property and the surrounding area. Information gathered over a period of 15 years, including the results of considerable drilling by other Government agencies in the Calamity Mesa area, and reports on six DMEA field examinations in the same vicinity, indicate that this area is unfavorable for the discovery of significant deposits of uranium ore.

A field examination of your property would not add any new information, and therefore, is not justified. However, if you do any further work on your property, or can submit new evidence that would indicate the possibility of finding significant uranium ore deposits on your property, we would be glad to give further consideration to your request.

Sincerely yours,

Frank E. Johnson
ACTING Administrator

FEJohnson/ms/gla 1/10/57
cc to: Admr.'s Reading File
Operating Committee
Code 700, Mr. Ching
Messrs. JECrawford, 3643
THKiilsgaard, 5224
JOHosted, 3210, GSA
DMEA Field Team, Region III (2)

8623

A. C. THOMAS

1309 Glenwood Avenue
GRAND JUNCTION, COLORADO

OFFICIAL FILE COPY
D M E A
RECEIVED JAN 8 1957

DATE	INITIALS	CODE
1-8-57	~~cbaig~~	~~700~~
		225

January 4, 1957

Mr. C. O. Mittendorf
United States Department of the Interior
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No. DMEA-4471 (Uranium)
Kanarado and Little Maverick Claims
Mesa County, Colorado

Dear Mr. Mittendorf:

We have received your letter of October 17, 1956 whereby the government has refused participation on a DMEA loan on the above mentioned property.

I have talked with your representatives in Denver and have been told that this grant was refused without a physical examination on the property. For this reason I am writing you on behalf of our corporation requesting that the government examine the property before refusing the grant requested.

I am aware of the fact that in prior years an examination was made on property in the same area and reported unfavorable. Since then, however, there have been two substantial ore discoveries in the immediate area and on the same trend as our property, namely the New Verde Mining Company and the Calamity Creek Uranium Company.

I, therefore, would appreciate very much your attention to this application.

Very truly yours,

Chipeta Uranium Inc.

By: A. C. Thomas, President

A. C. Thomas

700

FILE COPY
Surname: Ching
Ellis
Hood
Kilpatrick
Jeffrey

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

OCT 17 1956

Chipeta Uranium Corporation
315 North Avenue
Grand Junction, Colorado

Re: Docket No. DMEA-4471 (Uranium)
Kanarado and Little Maverick Claims
Mesa County, Colorado

Gentlemen:

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

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

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

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

Sincerely yours,

C. O. Mittendorf

Administrator

MChing/izm 10-15-56
cc to: Docket
Code 700
Mr. Ching
Admr.'s Reading File
Operating Committee
DMEA Field Team, Reg. III (2)
Messrs. JECrawford, Rm. 3643
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA

Docket

700

Ching
Ellis

Summary of Proposed Project

Object: Denial of application for an exploration project.

Docket No.: DMEA-4471

Commodity: Uranium

Applicant: Chipeta Uranium Corporation
315 North Avenue
Grand Junction, Colorado

Property: 10 unpatented lode mining claims, Kanarado Nos. 1-6 and Little Maverick Nos. 3-6 in secs. 29, 32, and 33, T. 50 N., R. 18 W., and in secs. 4 and 5, T. 49 N., R. 18 W., N.M.P.M.&B., Mesa County, Colorado. Applicant is the Lessee of Little Maverick Nos. 3 and 6 and Kanarado Nos. 1 through 6. No evidence was submitted to show property rights on Little Maverick Nos. 4 and 5.

Date of Application: September 14, 1956

Amount of Application: $23,250.00

Work Proposed: Explore the Salt Wash member of the Morrison formation by plug bit and core drilling in two stages. Stage I to consist of 36 holes aggregating approximately 8,100 feet and Stage II to consist of 1,900 feet of offset drilling of mineralized holes of Stage I. Costs are estimated as follows:

5,000 ft. plug bit drilling @ $1.25/ft.	$ 6,250.00	
5,000 ft. core drilling @ $2.50/ft.	12,500.00	
Access roads and drill site preparation	3,000.00	
Engineering and technical services	1,250.00	
Supplies, accounting, etc.	250.00	
Total		$23,250.00
Government participation @ 75%		$17,437.50

Field Team Report: September 26, 1956 - W. B. Gazdik, USGS: Concurred in by W.M. Traver, E.N. Harshman, J. William Hasler and J. F. Shaw.

The subject claims are located on the southwest tip of Calamity Mesa, about 4 miles outside the western boundary of the Uravan Mineral Belt, where known uranium deposits consist of small, discontinuous ore bodies with erratic spatial distribution.

The USGS and AEC conducted extensive drilling programs in the Calamity Mesa area. A total of 1,226 holes aggregating 116,481 feet were drilled, resulting in the discovery of 105,000 tons of indicated and inferred ore reserves averaging 0.32% U_3O_8 and 1.51% V_2O_5 . However, most of the ore was

found in the northern part of Calamity Mesa and the drilling indicated that the southern part is generally unfavorable for significant ore deposits.

Five of six DMEA applications covering nearby properties to the north and east of the subject claims were closed out for lack of information, denied, or recommended for denial, and in each case the properties involved were considered generally unfavorable for significant uranium deposits. The sixth application, Docket 4041, American Leduc Corporation, resulted in a contract. Results of drilling to date on this property have verified the general unfavorableness of the southern part of Calamity Mesa.

The Applicant drilled 76 holes in this area and claimed that 32 showed mineralization up to 0.10% U_3O_8 and 10 showed mineralization from 0.10 to 0.19% U_3O_8. No supporting assay data were submitted. Applicant stated that some ore hasbeen shipped from the Maverick No. 6 claim but AEC production records do not show this. The records do show 1.64 tons of ore containing 0.31% U_3O_8 and 1.38% V_2O_5 shipped from the Kanarado No. 3 claim in 1953. There are no known ore reserves on the subject claims.

Mineralized trends are practically nonexistent on the property. Ore bodies, if present, would probably be in the 50-100 ton class. Drilling depths would range from 150 to 300 feet. The proposed project is not suitable and it is recommended that the application be denied without a field examination.

Commodity Group Comments:

USGS, W. P. Williams, October 5, 1956:

All previous work in the areashows the southern part of Calamity Mesa to be unfavorable for any but very small, scattered ore deposits. Agrees with the recommendation that the application be denied forthwith on the basis of the large amount of information already available to the Government.

USBM, John E. Crawford, October 10, 1956:

Reviewed Report of Examination with the AEC representative. Agrees with the Field Team that the application should be denied without a field examination.

Rare & Miscellaneous Metals Div., Michael Ching, October 15, 1956:

The application is ambiguous with respect to the number of claims to be included in the proposed project. If all 10 claims listed are to be included, the 73 holes mentioned in the examiner's

report were drilled on the subject property and not on "adjoining claims to the northwest" as stated in the examiner's report. Apparently the holes were drilled on the Little Maverick No. 3 claim on 26 to 50-foot centers. While 10 holes reportedly penetrated ore-grade material, the Applicant gave no indication of having tried to exploit the deposit and it must be assumed that it was not of economic size or grade.

Properties such as those of the Calamity Creek Uranium Company (Docket 3934) and Cal-M-Co Uranium Corporation (Docket 4046), located nearer proven ore bodies and favorable sandstone were, nevertheless, denied exploration projects after field examinations. The subject property offers even less promise and denial on the basis of information already available on the general area appears to be warranted.

Conclusions and Recommendations:

The chances of making a significant discovery on this property are not good. In view of the history of this area and the large amount of information already available on nearby properties it is recommended that the application be denied without a field examination.

Ernest Wm. Ellis

Ernest Wm. Ellis, Chief
Rare and Miscellaneous
Metals Division

OCT 11 1956 gla

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

RECEIVED
OCT 11 1956

Date 10/10/56

DMEA Docket No. 4471
DMEA Contract No.
Commodity Uranium
Name of applicant Chipeta Uranium Corporation
Name of property Kanarado and Little Maverick Claims
Location of property Mesa County, Colorado
Estimated cost of project $23,250

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee

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

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

1. Date of subject document: 9/14/56. 2. Date received by reviewer: 10/5/56.

3. Prior reports on this property known to reviewer: Yes ☐, No ☒.

4. Prior reports on nearby properties known to reviewer: Yes ☒, No ☐.

5. Information available on past production: Yes ☐, No ☒.

6. Other pertinent factors known to reviewer: Yes ☒, No ☐.

7. Explain items marked yes above:
✓ DMEA dockets 3636, 3934, 3990, 4041, 4046, and 4275 were for properties in the same general area.

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

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

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

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

10/8/56 gla

IN REPLY REFER TO:

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

RECEIVED
OCT - 8 1956

October 5, 1956

Memorandum

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

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

Subject: Review of application, DMEA 4471, Chipeta Uranium Corp., Kanarado and Little Maverick claims, Calamity Mesa, Mesa County, Colorado.

The applicant proposes to explore for uranium ore deposits on five mining claims located on the south end of Calamity Mesa.

The proposed project would consist of 10,000 feet of drilling in 36 holes at an estimated total cost of $23,250.

Grand Junction personnel point out that over 100,000 feet of drilling has been completed on Calamity Mesa by the Atomic Energy Commission and the U. S. Geological Survey. Six field examinations have been made on the mesa in connection with other DMEA applications. All but one were denied. The single active contract is achieving poor results.

All previous work in the area shows the southern part of Calamity Mesa to be unfavorable for any but very small, scattered ore deposits.

I agree with the recommendation that the application be denied forthwith on the basis of the large amount of information already available to the Government.

W. P. Williams

W. P. Williams

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

RECEIVED
OCT - 3 1956

224 New Customhouse
Denver 2, Colorado

October 1, 1956

Memorandum

To: Secretary to the Operating Committee

From: DMEA Field Team, Region III

Subject: Docket DMEA 4471 (Uranium) Chipeta Uranium Corporation (Kanarado and Little Maverick Claims) Mesa County, Colorado

Enclosed are the original and three copies of the joint recommendations of members of the Grand Junction Office, DMEA. From their knowledge of habits and distribution of ore bodies on Calamity Mesa, and from their experience in that area, they recommend that the application be denied without a field examination. We concur in this recommendation.

DMEA Field Team, Region III

By W. M. Traver
Executive Officer

IN REPLY REFER TO:

MINERAL SITES
DMEA
RECEIVED
SEP 27 1956
U. S.
GEOLOGICAL SURVEY
DENVER, COLORADO

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DMEA
DEPARTMENT OF THE INTERIOR
SEP 28 1956
REGION III
DENVER, COLORADO

P. O. Box 360
Grand Junction, Colorado

September 26, 1956

RECEIVED
OCT - 3 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

Through: J. William Hasler
E. N. Harshman
J. F. Shaw

From: W. B. Gazdik

Subject: Recommendation for field examination, DMEA docket 4471 (Uranium), Chipeta Uranium Corporation (Kanarado and Little Maverick claims), Mesa County, Colo.

The Chipeta Uranium Corporation has applied for DMEA assistance on the Kanarado and Little Maverick claims, located on the southwest tip of Calamity Mesa in sections 29, 32 and 33, T. 50 N., R. 18 W., and section 4, T. 49 N., R. 17 W., Mesa County, Colorado.

The subject claims are located about 4 miles outside the western boundary of the Uravan Mineral Belt in an area of small production where known uranium ore deposits consist of small, discontinuous ore bodies with an erratic spatial distribution.

The U. S. Geological Survey and the A.E.C. conducted extensive drilling programs in the Calamity Mesa area. A total of 1226 holes consisting of 116,481 feet was drilled by the two Government agencies. A total of 105,000 tons of indicated and inferred ore reserves averaging 0.32 percent U_3O_8 and 1.51 percent V_2O_5 were found, mostly in the northern part of Calamity Mesa. This drilling indicated that the southern part of the mesa is generally unfavorable for significant uranium deposits.

The following DMEA applications for Government aid were submitted on properties located several miles east and north of the subject claims:

DMEA NO.	COMPANY	ACTION TAKEN.
3636	Atomic Uranium Company	Denied closed
3934	Calamity Creek Uranium Corp.	Denied
3990	Chesapeake & Colorado Uranium Co.	Denied
4041	American Leduc Corporation	Approved
4046	Col-M-Co. Uranium Corporation	Denied
4275	National Mines, Inc.	Denied pending

As shown above, five of the applications were denied because the properties involved were considered generally unfavorable for significant uranium deposits by the Defense Minerals Exploration Administration. However, DMEA 4041 (American Leduc Corporation) was approved and a drilling program is in progress a few miles east and northeast of the subject claims. Results of this drilling, thus far, have verified the general unfavorableness of the southern part of Calamity Mesa. The applicant drilled three holes on the subject claims and 73 holes on adjoining claims to the northwest. Map locations and assay data were not submitted with the application although it was indicated that 32 holes were drilled in weakly mineralized ground and 10 holes reportedly penetrated ore-grade material containing 0.10 to 0.19 percent U_3O_8.

There are no known ore reserves on the subject claims. However, the applicant intimated that some uranium ore was produced from the Little Maverick 6 claim which is included in the subject application. A search of A.E.C. production records failed to disclose any production from this claim, but it was recorded that 1.64 tons of uranium ore averaging 0.31 percent U_3O_8 and 1.38 V_2O_5 were shipped from the Kanardo 3 claim in 1953.

The applicant's proposed DMEA program consists of 5,000 feet of noncore drilling and 5,000 feet of core drilling at a total estimated cost of $23,250. Drill hole depths estimated by the applicant range from 150 to 300 feet. The proposed drilling is set up in two stages. Stage I drilling consists of 8100 feet and 36 holes spaced 200 feet apart on east-west fences. The holes on one fence line are staggered relative to holes on the next fence line and the fence lines are from 200 to 400 feet apart. Stage II drilling consisting of an estimated 1900 feet is planned to offset stage I ore holes.

From what is known of the habits and distribution of ore bodies on Calamity Mesa, the applicant's proposed DMEA program does not appear suitable. The history of the area shows that ore bodies are small and discontinuous and, if present on the subject property, would probably be in the 50-100 ton class. Mineralized trends are practically nonexistent. The drilling project as proposed by the applicant, with holes spaced 200 to 400 feet apart, is obviously inadequate. Holes spaced on a 50-foot grid would be more appropriate. On the other hand, holes drilled on 50-foot centers to a depth range of 150 to 300 feet would not be economically feasible considering the small size of the ore bodies that are to be expected.

In summary, extensive Government exploratory drilling, five DMEA field examinations and one DMEA drilling project have indicated that the subject claims are located in an area considered unfavorable for significant uranium deposits. The applicant did not furnish adequate data on the results of a drilling project that was completed on company claims adjacent to the subject property on the north. The company's proposed drilling project is considered unsuitable because drilling is planned on 200 to 400-foot centers in an area where known ore bodies are characteristically small and discontinuous. It is, therefore, recommended that the application for DMEA assistance be denied without a field examination.

W. B. Gazdik,
Geologist.

WBG/mlr

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration
Washington 25, D. C.

September 20, 1956

Chipote Uranium Corporation
315 North Avenue
Grand Junction, Colorado

Subject: DMEA-4471
Re: Exploration Assistance
Kanarado & Little Maverick Claims

Your application for exploration assistance, dated September 14, 1956 submitted to our office at Denver, has been assigned Docket Number DMEA-4471 and referred to the Rare and Miscellaneous Metals Division in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

Allen S. Dakan, Chief
Operations Control and
Statistics Division

Copy to:

Region III-Denver, Colorado
Code 700

3571

4471

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

RECEIVED
SEP 17 1956

224 New Customhouse
Denver 2, Colorado

September 13, 1956

Mr. A. C. Thomas
1309 Glenwood Avenue
Grand Junction, Colorado

Re: Application For DMEA Aid (Uranium)
(Kanarado and Little Maverick Claims)
Mesa County, Colorado

Dear Mr. Thomas:

Returned herewith are four copies of the Form MF-103 submitted with your application for DMEA aid.

Will you please date and sign each copy of the Certification and return all copies to this office so that we may continue to process your application.

Very truly yours,

W. M. TRAVER

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

Encls.
HMC:bh
cc-Sect., Op. Comm. (2)
Subject
Chron.

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

RECEIVED
SEP 19 1956

224 New Customhouse
Denver 2, Colorado

September 17, 1956

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Application for DMEA Aid (Uranium) Chipeta Uranium Corporation (Kanarado and Little Maverick claims) Mesa County, Colorado

Enclosed are two copies of the subject application in the amount of $23,250.00. One copy of the application is being forwarded the Grand Junction office DMEA for their review and recommendations concering the advisability of making a field examination. One copy of the application is being retained in our file.

DMEA Field Team, Region III

W. M. Traver

By W. M. Traver
Executive Officer

Enclosures

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

RECEIVED
SEP 1 0 1956

224 New Customhouse
Denver 2, Colorado

September 17, 1956

Memorandum

To: J. W. Hasler

From: Field Team, Region III

Subject: Application for DMEA Aid (Uranium) Chipeta Uranium Corporation (Kanarado and Little Maverick claims) Mesa County, Colorado

Enclosed is one copy of the subject application.

Will you please discuss this application with the Bureau of Mines representative in the Grand Junction office and the Atomic Energy Commission and forward this office nine copies of your joint recommendations concerning the advisability of a field examination on the subject property.

DMEA Field Team, Region III

W. M. TRAVER

By W. M. Traver
Executive Officer

Enclosures

WMC:ytl

cc: Sec. Op. Comm. (2)
Harshman
Shaw (2)
Docket
Chron.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

DMEA
DEPARTMENT OF THE INTERIOR
Form Approved.
Budget Bureau No. 42-R1035.2.
SEP 17 1956
REGION III
DENVER, COLORADO

SEP 10 1956

DMEA
DEPARTMENT OF THE INTERIOR
SEP 12 1956
REGION III
DENVER, COLORADO

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

Not to be filled in by applicant

Docket No. 4471
Metal or Mineral Uranium
Date Received 9-19-56
Estimated Cost $23,250
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:

Chipeta Uranium Corporation
315 North Avenue
Grand Junction, Colorado

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

16—66551-1

See supplemental sheets for answers to the above and following questions.

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

.....

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

☑ Money ☑ Use of equipment owned by you ☑ Other Services

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 September 14, 1956

Chipeta Uranium Inc.
(Applicant)

By A. L. Thomas, President

Grand Junction, Colorado

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

DMEA
DEPARTMENT OF THE INTERIOR
SEP 11 1956
REGION III
DENVER, COLORADO

RECEIVED
SEP 10 1956

September 10, 1956

Defense Minerals Exploration Administration
District Bureau of Mines
New Custom House
Denver, Colorado

Attention: Mr. Townsend

Dear Mr. Townsend:

I am forwarding you under separate cover an application for a DMEA loan on the mining claims we have in the Gateway Mining District of Mesa County, Colorado. You will also find in the enclosures four copies each of the Lease Agreement we have with B. B. Warren and Kanarado Mining Company respectively.

Should you need any additional information on this application please advise to my home address:

A. C. Thomas
1309 Glenwood Ave.
Grand Junction, Colorado

Very truly yours,

CHIPETA URANIUM INC.

By: A. C. Thomas, President

ACT:js

COPY

April 28, 1956
1060 Grand Avenue
Grand Junction, Colorado

DMEA
DEPARTMENT OF THE INTERIOR
SEP 12 1956
REGION III
DENVER, COLORADO

Mr. A. C. Thomas, President
Chipeta Uranium Corporation
315 North Avenue
Grand Junction, Colorado

Dear Mr. Thomas:

Enclosed is the D.M.E.A. application and proposal for the Chipeta Uranium Corporation on the Kanarado 1 - 6 and Little Maverick #6, Calamity Mesa, Juanita Arch Area, Mesa County, Colorado.

The total estimate for the proposal is $23,250.00

Basis:

10,000 drilling @ 150' per day	67 days
67 days at 26 working days	2½ months

Drilling:

10,000 feet

5000 feet plug bit @ 1.25	$ 6250.00
5000 feet core drill @ 2.50	12500.00
	$18750.00

Road work:

Drill roads & sites 36 holes $3000.00

Engineering:

1 Engineer & Consultant @ $500.00 per month $1250.00

Operating & Supplies:

Engineers car -

gas	50.00	per month x 2½ months	$125.00
oil	5.00	" " " " "	12.50
upkeep	20.00	" " " " "	50.00
			$187.50

Miscellaneous:

Accounting $25.00 per month @ 2½ months		$ 62.50
Workman compensation		
Employers liability insurance		
Payroll taxes	$20,000 @ 6%	1200.00

This $1200.00 would be borne by contract drilling company.

Total cost:

Drilling	$18,750.00
Road work	3,000.00
Engineering	1,250.00
Engineering expenses	187.50
Accounting	62.50
	$23,250.00

Bids for the drilling should be called for when the application is accepted by the D.M.E.A.

Respectfully submitted,

Jack M. Harlan

Jack M. Harlan
Registered Professional Engineer
and Consultant
Colo. #2527

JMH/bh

Chipeta Uranium Corporation
315 North Avenue
Grand Junction, Colorado

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

1 (a) The Corporation is known as The Chipeta Uranium Corporation
A. C. Thomas, President
Box 464 or 1309 Glenwood Avenue
Grand Junction, Colorado

Carmen Santy, Vice President
261 Ute Avenue
Grand Junction, Colorado

Tony Santy, Sec't. & Treas.
315 North Avenue
Grand Junction, Colorado

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DEPARTMENT OF THE INTERIOR
SEP 12 1956
REGION III
DENVER, COLORADO

1 (b) Corporation papers dated July 19, 1955, recorded Aug. 13, 1955 11:26 A.M., number 644169 & 4513 are at the Mesa County Courthouse, Grand Junction, Colorado, are a matter of public record.

The Board of Directors are:

1 (c)

A. C. Thomas	C. H. Pierson
Carmen Santy	Ben F. Hall
Tony Santy	A. H. Minowitz
R. N. Dunn	Fred Zanett

3 (a) The Claim group lies in T 50 N, R 18 W, sections 29, 32 and 33, and the south one-half of the Little Maverick No. 6 lies in T 49 N, R ~~17~~ 18 W, Sec. 4, on the western point of Calamity Mesa, Juanita Arch Area, Mesa County, Colorado.

mc

The claim group consists of the Little Mavericks 3, 4, 5 and 6 and Kanarado 1-6.

The proposed drilling program would be on the Kanarado 1-2, 4, 5, and 6, and the Little Maverick #6. Drilling should be confined to the west half of Kanarado 1 & 2 and most of Little Maverick #6 and the Kanarado 4, 5 and 6. (see claim map)

Chipeta Uranium Corp.
315 North Avenue
Grand Junction, Colorado

3 (b) The property has been worked under the names of Little Maverick and Kanarado mining claims and ore has been shipped under these names.

The Kanarado 1-6 and Little Maverick 3, 4, 5 and 6 are certified and there is a remaining eligible balance of 9656.67 pounds of uranium.

3 (c) The Little Maverick 3 & 6 and Karanado 3, 4, 5, and 6 claims are held by rights of lease. The mining rights are held by the Chipeta Uranium Corporation. A copy of the original leases to Chipeta Uranium Corp. are included as exhibits under 3 (d) below.

3d The photostatic copies of the lease accompany this report. See attached photostats, Exhibits A - B.

3e There are no known liens or encumberances on the property.

3f The following is recorded in the Mesa County Courthouse, Grand Junction, Colorado.

Claim	Loc. Date	Rec. Date	Book	Page
Kanarado 1	6/18/51	8/4/51	551	421
Kanarado 2	6/18/51	8/4/51	551	422
Kanarado 3	6/18/51	8/4/51	551	423
Kanarado 4	6/18/51	8/4/51	551	424
Kanarado 5	6/18/51	8/4/51	551	425
Kanarado 6	6/18/51	8/4/51	551	426

Located by Kanarado Mining Co. by C. T. Vashus et al.

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315 North Avenue
Grand Junction, Colorado

Claim	Loc. Date	Rec. Date	Book	Page
Little Maverick 3	7/8/40	10/8/40	393	46
Little Maverick 4	7/8/40	10/8/40	393	46
Little Maverick 5	7/8/40	10/8/40	393	47
Little Maverick 6	7/8/40	10/8/40	393	47

Located by John Wade, Ernest Hoover, Rex Barton, O. L. Vowell.

4a Exploration drilling has been done on the north end of the group. Seventy-three holes have been drilled, (see map of claims) thirty-two have shown mineralization up to 0.10% U_3O_8 equivalent and 10 holes show 0.10 to 0.19% U_3O_8. The ore shows were also chemically analyzed. Three holes have been drilled on the claims which are to be considered on this exploration drilling program. Some ore has been shipped from a short adit on the Maverick No. 6, but figures are not available except from the Finance Division of the A.E.C. as the lessees can not be located, but this information is accessible to a D.M.E.A. team.

The drilling was done by the Chipeta Uranium Corporation but the mining was done some years in the past.

All mine workings are accessible.

4b There is no current production and no known ore reserves at present. The ore shipped was of commercial grade.

4c The ten claims lie on Salt Wash member of the Jurassic Morrison formation with the north one quarter of the Kanarado 4, 5 and 6 extending

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Grand Junction, Colorado

up onto the Brushy Basin member of the Morrison. All of the Kanarado #2 and 2/3 of the Little Maverick #6 also extending up onto the Brushy Basin member of the Morrison. These are the claims which we propose to include in the application for the D.M.E.A. exploration loan, and exclude the claims on the northwest end which have already been drilled. (see accompanying map).

The mineralization is carnotite-vanadium type deposit, and these have been important.

All known uranium-vanadium deposits in this area are in the Morrison formation. Most of the deposits are in the uppermost sandstone stratum of the Salt Wash sandstone member, scattered deposits are known in the conglomeratic sandstone lenses at the base of the Brushy Basin shale member. Ore grade mineralization has been found on this property in the top and middle stratum of the Salt Wash member.

In general the ore minerals are deposited in irregular layers that roughly follow the sandstone beds. In most deposits the highest grade concentrations of ore minerals occur in sharply bounded, elongated concretionary structures, called "rolls". Within these rolls this mineral generally is distributed as diffusion layers, the richer layers commonly lying near the margins of the rolls.

Although many rolls are small and irregular, the larger rolls are elongate and may extend with little change of direction for more than 100 feet. The elongate rolls in an ore body or group of ore bodies in

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a given area generally have a common orientation. This orientation is roughly parallel to the elongation of the ore bodies.

Cross bedded, relatively coarse grained sandstone is more favorable than thinly or evenly bedded, fine-grained sandstone. Sandstone that contains considerable amounts of gray, altered mudstone, or underlain by a considerable thickness of this rock, is most favorable--this guide is perhaps the most useful in diamond-drill exploration.

In this area the ground underlain by the Salt Wash sandstone member of the Morrison formation that appears to be the most favorable for the occurance of uranium-vanadium ore is Flat Top Mesa and along the eastern edge of the quadrangle near the Maverick Mines and the area just south of Little Maverick canyon. (see quadrangle map) There are numerous mines just north of this property and in the same formations and the same identical geology. The tip of Calamity Mesa has not been extensively explored by drilling as yet, and several rim shows have been mined and produced commercial ore.

Calamity Mesa to the east has numerous good mines in these same Salt Wash members and Numont Mining Co. has a very extensive ore "roll" about one mile east of this property in similar geologic formations.

"Deposits have been discovered recently and worked on Calamity Mesa south of Little Maverick canyon, and deposits in the Brushy Basin member have been prospected, one near the head of Cave canyon". (exerpt from Geology of the Juanita Arch Quadrangle, Colorado, by Eugene M. Shoemaker).

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Grand Junction, Colorado

The Depression mines, on the northwest side of Flat Top Mesa, are developed in a group of blanketlike ore bodies 100 to 300 feet across. The ore lays in layers up to 2 feet thick. Rolls are moderately developed. This also has the same geology as the western tip of Calamity Mesa and these claims for which application is being made.

4d The property is easily accessible on a good access road. The property is 14 miles past the Arrowhead Mine owned by Climax Uranium Co. which makes a 79 mile ore haul to the Climax mill. The same distance to supply points in Grand Junction and a trailer house provides living quarters for the drill crew on the property.

4e Man power will be provided by Chipeta Uranium Corp. Material and supplies are available at Grand Junction. Water is available 7 miles from the property for both domestic and drilling purposes.

5a This proposal is for the exploration of uranium-vanadium ores characteristic to this area.

5b AN EXPLORATION PROGRAM FOR THE LITTLE MAVERICK 6 AND KANARADO 1 - 6 MINING CLAIMS, CALAMITY MESA, JUANITA ARCH AREA, MESA COUNTY, COLORADO

We propose to drill and explore the middle rim of the Salt Wash as no known bottom rim deposits have been discovered in this area. The depth from the top of the Salt Wash thru the middle rim is assumed to be about 150 feet and 300 feet assumed from top of Brushy Basin. Plus or minus footage could be compensated by more or less holes as drilling progresses.

Chipeta Uranium Corp.
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The proposal is to divide the drilling program in two stages, stage #1 with approximately 8100 feet of drilling and stage #2 of 1900 feet of drilling to be used for off-set holes on ore hole discoveries.

Stage #1 is to be comprised of three groups of holes on 200' centers beginning at the southeast corner of Kanarado #6 and extending due eastward five holes, then the second row of holes 200' north extending due east-west but offset 100' west so the fence has a tendency to cover the ground more thoroughly than a square grid would. This group is composed of eleven (11) holes with an approximate 1800 feet of drilling.

The second group is 400 feet north of group 1 and the first hole of the bottom line is due north of the first hole of group 1. The same grid is used for 13 holes with a drilling footage of 3000 feet.

Group 3 is 400 feet north of group 2, same grid with 12 holes for a drilling footage of 3300 feet.

The remaining 1900 feet could be used to offset ore holes or for the extension of the grids should drilling warrant. (see claim map)

Geologically as well as structerally this property is similar to the geology and structure of Flat Top Mesa, the area east of Maverick canyon and the rest of Calamity Mesa, all three of which have good producing mines. This property is surrounded by producing properties

Chipeta Uranium Corp.
315 North Avenue
Grand Junction, Colorado

and has indications of ore on outcrops, has produced some ore and is very definitely worthy of a drilling program.

Location

The claims are 79 miles from Grand Junction, Colorado and the Climax Mill. The property is reached by traveling 9 miles southeast to Whitewater then southwest toward Gateway to the end of the black-topped pavement at Taylors Ranch, then left over the Uncompahgre road to Calamity Mesa, continue on 14 miles past the Arrowhead Mine of Climax Uranium to the property on the western tip of Calamity Mesa.

Grand Junction is the mining center for this area. Numerous firms stock mining and drilling supplies. Sufficient mining or drilling labor may be secured in Grand Junction as well as operational supplies.

History and Production

This ground was located for uranium-vanadium and five small adit operations have been worked on rim exposures. The tonnage and grade figures are available only thru the shipper or the Finance Division of the Atomic Energy Commission. The lessee personal are unable to be located, but the Finance Division will give these figures to a duly qualified D.M.E.A. team.

The Kanarado 1 - 6 and Little Maverick 3, 4, 5 & 6 have a remaining certification bonus payment on 10,000 pounds of 9656.67 pounds of uranium.

Chipeta Uranium Corp.
315 North Avenue
Grand Junction, Colorado

With a supposed average of 0.20% U_3O_8 this would mean at least 100 tons of ore shipped of commercial grade.

The Chipeta Uranium Corporation has drilled approximately 500 feet of exploratory drill holes on the north end of the group but now desire a D.M.E.A. loan to explore the Brushy Basin-Salt Wash members of the Morrison, on the south and east end of the group.

The claims were reported to have been surveyed by Melbye & Rudd of Holden, Colorado.

Claims

There are ten claims in this group in T 50 N, R 18 W, Sections 29, 32, 33 and T 49 N, R 17 W, Section 4, on the western tip of Calamity Mesa, Juanita Arch Area, Mesa County, Colorado.

The claims are recorded in the Mesa County Courthouse, Grand Junction, Colorado.

Ore Reserves

Blocked out ore is non-existant except for some narrow exposures in the adits.

Geology

The ten claims lie on Salt Wash member of the Jurassic Morrison formation with the north one quarter of the Kanarado 4, 5 and 6 extending

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Grand Junction, Colorado

up onto the Brushy Basin member of the Morrison. All of the Kanarado #2, 4, 5 & 6 and 3/4 of the Kanarado #1 and 2/3 of the Little Maverick #6 also extending up onto the Brushy Basin member. These are the claims which we propose to include in the application for the D.M.E.A. exploration loan, and exclude the claims on the northwest end which have already been drilled. (see accompanying map)

The mineralization is carnotite-vanadium type deposit, and these have been important.

All known uranium-vanadium deposits in this area are in the Morrison formation. Most of the deposits are in the middle and top sandstone stratum of the Salt Wash sandstone member, scattered deposits are known in the conglomeratic sandstone lenses at the base of the Brushy Basin shale member. Ore grade mineralization has been found on this property in the top and middle stratum of the Salt Wash member.

The Salt Wash member crops out above the slope forming Summerville formation as a series of thick, resistant ledges and benches of which there are three such ledges on this property. Sandstone predominates and ranges in color from nearly white to gray, light buff, and rusty red. Sandstone commonly occurs as strata traceable as ledges for considerable distances along the outcrop, but within each stratum individual beds are lenticular and discontinuous; beds wedge out laterally, and other beds occupying essentially the same stratigraphic position wedge in. Thus any relative continuous sandstone stratum ordinarily consists of numerous

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Grand Junction, Colorado

interfingering lenses, with superposed lenses in many places filling channels carved in underlying beds.

Ripple marks, current lineation, rill marks, and cut and fill structures indicate the Salt Wash was deposited under fluvial conditions. The Salt Wash is about 200 feet thick in this particular area.

The Brushy Basin shale member contrasts strongly in overall appearance with the Salt Wash, but the contact between the two members is gradational.

The Brushy Basin shale member consists predominantly of vari-colored bentonitic shale and mudstone, with intercalated beds and lenses of conglomerate and sandstone, and a few thin layers of limestone. Beds of chert pebble conglomerate a few inches to 25 feet thick occur at intervals throughout the member.

The Brushy Basin at this particular location is approximately 200 feet thick.

The general elevation is about 6100 feet above sea level.

Two ore horizons have rim ore exposures on this property with five adit operations already worked and numerous other exposures along the rims.

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315 North Avenue
Grand Junction, Colorado

Cost Estimates:

Basis

10,000 ft. drilling @ 150' per day		67 days
67 days at 26 working days		2 1/2 months

Drilling costs:

10,000 feet of drilling		
5000 feet plug bit	@ $1.25	6,250.00
5000 feet core	@ 2.50	12,500.00
		18,750.00

Road work

Drill roads and drill sites $3000.00

5c The work will start within 15 days and be completed within two and one-half months from the date of an exploration project contract.

5d The Personal record of Mr. J. M. Harlan is attached and he will supervise the operation.

6a There will be no independent contract work.

6b The labor will consist of:

1 Engineering & Geological Consultant		$500.00 per month
$500.00 x 2½ months	Total	$1250.00

6c Operating materials and supplies:

Gas for engineers car	$50.00	
Oil for engineers car	5.00	
Upkeep for engineers car	20.00	
	$75.00 per month	
$75.00 x 2½ months	$187.50	Total

Chipeta Uranium Corp.
315 North Avenue
Grand Junction, Colorado

6d Operating equipment:

This equipment is now owned by the Chipeta Uranium Corporation, and will be used on the drilling program.

1 1955 Willys 4 wheel drive pick-up	2507.00
1 Bon Ton Trailerhouse	600.00
	3107.00

6e Rehabilitation and repairs:

There is no rehabilitation or repairs to be made on any of the buildings, installations, fixtures or moveable operating equipment, now owned by Operator which will be devoted to the exploration project.

6f No new buildings, improvements or installations are necessary for the exploration project.

6g Miscellaneous:

Accounting $25.00 per month @ 2½ months		$ 62.50
workmen compensation		
employers liability insurance	total	
payroll taxes	20,000 @ 6%	1200.00
		$1262.50

The $1200.00 will be borne by the drilling company

6h No contingencies

7a We are prepared to furnish our share of the cost of the proposed project in accordance with the regulations on Government participation. (Sec. 7, D.M.E.A. No. 1)

7b See application sheet

PERSONAL HISTORY

Jack M. Harlan
Registered Professional Engineer of Colorado, #2527

RECEIVED
SEP 1 0 1956

Born in Butte, Montana, May 13, 1913, married and have three children. Reside at 1060 Grand Avenue, Grand Junction, Colorado, phone 4893. Had 4 years at Montana School of Mines in Mining Engineering and Mining Geology, and 20 years of experience in the mineral industries in uranium, copper, lead, zinc, manganese, chrome and oil. Experienced in exploration and production of the metals both underground, and by open pit methods and petroleum exploration.

PROFESSIONAL RECORD

(1) "Q" Security clearance from the Federal Bureau of Investigation, for the Atomic Energy Commission. The "Q" group is the highest security group for loyalty, honesty, and integrity granted by the Federal Government.

(2) May, 1955 to present - 10 months as an independent Professional Mining and Geological Consulting Engineer, Colorado #2527. Such work included mine evaluation, geological evaluation, mine management and exploration with the reports and maps required as a Professional Consultant.

(3) Jan. 1952-May 1955 - 2½ years United States Atomic Energy Commission, six months of exploration and two years in the Mining Division. This work consisted of geological as well as mine evaluation, and as District Engineer for the area of Colorado, Utah, Nevada and California, and northern Arizona and New Mexico. I was responsible for all information on prospecting, mining, geology and production records in this area, and coordinator between the producers and the A.E.C.

(4) Jan. 1951-Jan. 1952 - 1 year with Kennecott Copper Corporation, as Mining Engineer in the open pit operations at Santa Rita, Mew Mexico. This work entailed the engineering of the open pit operations, laying out of highways, railroads and during this period the layout of a new town-site as the pit

operations required the removal of the old town.

(5) 1950-1951 - 1 year U. S. Bureau of Mines, Region 7, in North and South Carolina, Tennessee, Georgia, Mississippi and Florida. This work consisted of mining and geological evaluation and examination of all minerals in this area, and advisory suggestions for operation and exploration to the operators and prospectors with reports to the U. S. Bureau of Mines.

(6) 1944-1950 - 6 years Continental Oil Co., Petroleum Exploration, Oil Geology and Geophysics. This time was divided into Seismic Operator, Computer, and Chief of Party. The work consisted of structural mapping and interpretation, and the management of field crews in the field of Petroleum Exploration.

(7) 1936-1944 - 8 years Anaconda Copper Mining Co., Butte, Montana. The work was divided into several phases as it was the first practical application of the technical education.

1 Contract miner in drifts, raises and stopes.

2 Sampling proceedures and ore reserve calculations.

3 Mining Engineering.

4 Mining Engineering Research Department on improving underground mining methods, improved drilling methods, problems in service and ore haulage, and other problems in mining.

5 Supervisor of "On-The-Job" instructions for miners (during the war) when the armed forces released 2000 men to the A.C.M. to be trained in underground copper mining.

6 Production management. Shift boss over a portion of the mine and shaft boss. This work entailed the direction of about 40 contract miners in the mining of copper ores.

LEASE AGREEMENT

RECEIVED
SEP 10 1956

This agreement, Made and entered into this 16th day of May, A. D. 1956, by and between B. V. Warren of Grand Junction, Colorado, hereinafter called Lessor and Chipeta Uranium Inc, of Grand Junction, Colorado hereinafter called Lessee, WITNESSETH:

Whereas, Lessor is owner of one quarter (1/4) interest in certain unpatented mining claims staked and recorded as Little Maverick, claims Numbers three (3) and six (6) situated in the Gateway Mining District, Mesa County, Colorado. and

Whereas, It is the mutual wish and desire of the lessor and lessee hereto that the lessor lease the above described mining claims of full and complete interest to the lessee, and also that the lessor lease their three-fourths interest of the said Little Maverick Claims Nos. 3 and 6 to the lessee for a period of three (3) years beginning May 1, 1956 and ending May 1, 1959, and subject to the agreements and covenants herein contained, and hereafter stated;

NOW, THEREFORE, In consideration of the premises and mutual covenants and agreements herein contained, IT IS MUTUALLY COVENANTED AND AGREED as follows, to-wit:

1. That the lessor hereto for and in consideration of the royalties and bonuses hereinafter reserved does hereby lease unto the lessee the above described mining claims of full and partial interest for a period of three years begining on May 1, 1956 and ending May 1, 1959, subject, however, to the renewal clause hereinafter stated.

2. That the lessee hereby agrees to pay to the lessor as royalty fifteen per cent (15) of the value of all ores extracted from said premises, and, or of all monies received from the sale of such ores produced and sold. The lessee agrees to ship said ores or deliver same to some regular ore buyer, and to instruct said buyer, or buyers, to pay to

lessor the percentage as royalty as hereinabove stated, and as per the interest held by the lessor in the said above described properties.

3. The lessee further agrees to pay to the lessor one-third (1/3) or thirty-three and one-third (33 1/3) per cent of any and all bonus payments received by the lessee from any source during the life of this lease.

4. Lessee agrees to enter upon said mining claims within fifteen (15) days from the date of this lease, and to perform or cause, or have performed at least forty (40) eight hour shifts of mining labor per month, such performance to be in a good mining fashion, in a manner necessary to good and economical mining, with due regard to the development and preservation of said mine or mining properties as a workable mining property, and to the special covenants herein contained. Lessee agrees to perform said forty shifts of mining each and every month during the life of this lease, unless prevented by actions of the elements or causes beyond the control of the lessee.

5. Should lessee, in connection with or in any way relating to the mining of said claims, employ over three (3) men, the lessee shall carry workmen's compensation insurance upon all employees, or sub-lessee's in or about said mining claims, and shall pay promptly all bills for labor and materials incurred in it's operation hereunder, and shall pay Social Security Taxes and other taxes which may be imposed upon it in carrying on operations, and shall post the property in the usual manner to advise the public of the fact that such operations are being conducted by the lessee and that the lessor will not be responsible therefor.

6. Lessee shall keep accurate accounts or records, of the ore produced and sold from said mining properties, and furnish the lessor or his agent with duplicate settlement sheets of all ores sold. Such records shall be open to the inspection by the duly authorized agent or attorney of the lessor, together with lessee's records of geological data and log of said work done

in said development of said claims.

7. The lessee further agrees to allow the lessor or his agents from time to time to enter upon and into all portions of said mines for inspections, probing and checking of work done in said development of said claims.

8. Thes lessee agrees to not transfer this lease to any other lessee without written consent of the lessor herein. In the event lessee shall fail, refuses or neglect to perform any of its promises and covenants herein contained, lessor shall have the right to rescind and terminate this contract by giving notice to terminate this contract by registered mail, with the same to become effective thirty (30) days from and after the date of the mailing of the said notice. Within the period of thirty days the lessee may remove the defaults mentioned in said notice and thereupon this contract shall be fully reinstated, but should it fail to remove the said defaults within said period this contract shall be considered as rescinded and of no further force and effect, and the lessee shall have the right to remove all of its owned or leased or rented equipment other than that owned by the lessor.

9. IT IS MUTUALLY AGREED between the lessee and lessor hereto that time is of the essence of this agreement, and upon failure of the lessee to make any one or more of said royalty payments, or perform any of the covenants and agreements herein contained to be kept and performed by it, this agreement may be terminated at the election of the lessor upon giving lessee thiety days written notice of his intention so to do, as hereinabove provided, and in the event of such termination, all payments theretofore made by lessee to lessor shall be kept and retained by lessor in full satisfaction and liquidation of all damages lessor may have sustained by breach of this agreement and by way of rental, and upon such termination, lessor shall have the right to re-enter and take immediate possession of said properties.

10. IT IS FURTHER MUTUALLY UNDERSTOOD AND AGREED that the lessee is hereby granted the option to renew this lease for a

further term of three (3) years from and after May 1, 1959 upon giving to lessor thirty (30) days notice of intention so to do prior to the end of the primary term.

11. Lessor agrees that lessee may obtain a D. M. E. A. loan in connection with mining operations to be carried on by lessee hereunder and agrees to cooperate fully with lessee in the obtaining of such loan.

12. IT IS FINALLY AGREED That each and all covenants and agreements herein contained shall be binding upon, and inure to the benefit of the heirs, executors, administrators, successors and assigns of the parties hereto.

IN WITNESS WHEREOF The parties hereto have executed this lease the day and year first above written.

B. V. Warren, Lessor

B V Warren

CHIPETA URANIUM INC.

BY A C Thomas President

ATTEST:

Tom Beatty
Secretary

LEASE AGREEMENT

THIS AGREEMENT, Made and entered into this 16th day of May, A. D. 1956, by and between KANARADO MINING & DEVELOPMENT COMPANY of Ohio City, Colorado, hereinafter called Lessor, and CHIPETA URANIUM COMPANY, Inc., of Grand Junction, Colorado, hereinafter called Lessee, WITNESSETH:

WHEREAS, Lessor is owner in full interest of certain unpatented mining claims staked and recorded as Kanardo Mining Claims Nos. 1 to 6 both inclusive and are owners of three-fourths (3/4) interest in Little Maverick Claims Nos. 3 and 6, all situate in the Gateway Mining District of Mesa County, Colorado, and

WHEREAS, It is the mutual wish and desire of the lessor and lessee hereto that the lessor lease the above described mining claims of full and complete interest to the lessee, and also that the lessor lease their three-fourths interest of the said Little Maverick Claims Nos. 3 and 6 to the lessee for a period of three (3) years beginning May 1, 1956 and ending May 1, 1959, and subject to the agreements and covenants herein contained, and hereafter stated;

NOW, THEREFORE, In consideration of the premises and mutual covenants and agreements herein contained, IT IS MUTUALLY COVENANTED AND AGREED as follows, to-wit:

1. That the lessor hereto for and in consideration o the royalties and bonuses hereinafter reserved does hereby lease unto the lessee the above described mining claims of full and

partial interest for a period of three years beginning on May 1, 1956 and ending May 1, 1959, subject, however, to the renewal clause hereinafter stated.

2. That the lessee hereby agrees to pay to the lessor as royalty fifteen per cent (15) of the value of all ores extracted from said premises, and, or of all monies received from the sale of such ores produced and sold. The lessee agrees to ship said ores or deliver same to some regular ore buyer, and to instruct said buyer, or buyers, to pay to lessor the percentage as royalty as hereinabove stated, and as per the interest held by the lessor in the said above described properties.

3. The lessee further agrees to pay to the lessor one-third (1/3) or thirty-three and one-third (33 1/3) per cent of any and all bonus payments received by the lessee from any source during the life of this lease.

4. Lessee agrees to enter upon said mining claims within fifteen (15) days from the date of this lease, and to perform or cause, or have performed at lease forty (40) eight hour shifts of mining labor per month, such performance to be in a good mining fashion, in a manner necessary to good and economical mining, with due regard to the development and preservation of said mine or mining properties as a workable mining property, and to the special covenants herein contained. Lessee agrees to perform said forty shifts of mining each and every month during the life of this lease, unless prevented by actions of the elements or causes beyond the control of the lessee.

5. Should lessee, in connection with or in any way relating to the mining of said claims, employ over three (3) men, the lessee shall carry workmen's compensation insurance upon all employees, or sub-lessee's in or about said mining claims, and shall pay promptly all bills for labor and materials incurred in it's

operation hereunder, and shall pay Social Security Taxes and other taxes which may be imposed upon it in carrying on operations, and shall post the property in the usual manner to advise the public of the fact that such operations are being conducted by the lessee and that the lessor will not be responsible therefor.

6. Lessee shall keep accurate accounts or records, of the ore produced and sold from said mining properties, and furnish the lessor or his agent with duplicate settlement sheets of all ores sold. Such records shall be open to the inspection by the duly authorized agent or attorney of the lessor, together with lessee's records of geological data and log of said work done in said development of said claims.

7. The lessee further agrees to allow the lessor or his agents from time to time to enter upon and into allportions of said mines for inspection, probing and checking of work done on said properties.

8. The lessee agrees to not transfer this lease to any other lessee without written consent of the lessor herein. In the event lessee shall fail, refuse or neglect to perform any of its promises and covenants herein contained, lessor shall have the right to rescind and terminate this contract by giving notice to terminate this contract by registered mail, with the same to become effective thirty (30) days from and after the date of the mailing of the said notice. Within the period of thirty days the lessee may remove the defaults mentioned in said notice and thereupon this contract shall be fully reinstated, but should should it fail to remove the said defaults within said period this contract shall be considered as rescinded and of no further force and effect, and the lessee shall have the right to remove all of its owned or leased or rented equipment other than that owned by the lessor.

9. IT IS MUTUALLY AGREED between the lessee and lessor hereto that time is of the essence of this agreement, and upon failure of the lessee to make any one or more of said royalty payments, or perform any of the covenants and agreements herein contained to be kept and performed by it, this agreement may be terminated at the election of the lessor upon giving lessee thirty days written notice of his intention so to do, as hereinabove provided, and in the event of such termination, all payments theretofore made by lessee to lessor shall be kept and retained by lessor in full satisfaction and liquidation of all damages lessor may have sustained by breach of this agreement and by way of rental, and upon such termination, lessor shall have the right to re-enter and take immediate possession of said properties.

10. IT IS FURTHER MUTUALLY UNDERSTOOD AND AGREED that the lessee is hereby granted the option to renew this lease for a further term of three (3) years from and after May 1, 1959 upon giving to lessor thirty (30) days notice of intention so to do prior to the end of the primary term.

11. Lessor agrees that lessee may obtain a D.M.E.A. loan in connection with mining operations to be carried on by lessee hereunder and agrees to cooperate fully with lessee in the obtaining of such loan.

12. IT IS FINALLY AGREED That each and all covenants and agreements herein contained shall be binding upon, and inure to the benefit of the heirs, executors, administrators, successors and assigns of the parties hereto.

IN WITNESS WHEREOF The parties hereto have executed this lease the day and year first above written.

KANARADO MINING & DEVELOPMENT COMPANY

By _____ President

ATTEST:

_____ & Acting Secretary

CHIPETA URANIUM COMPANY, Inc.

By _____ President

ATTEST:

_____ Secretary

U. S. Government Messenger Envelope

Standard Form No. 65 (Rev. 1/46)

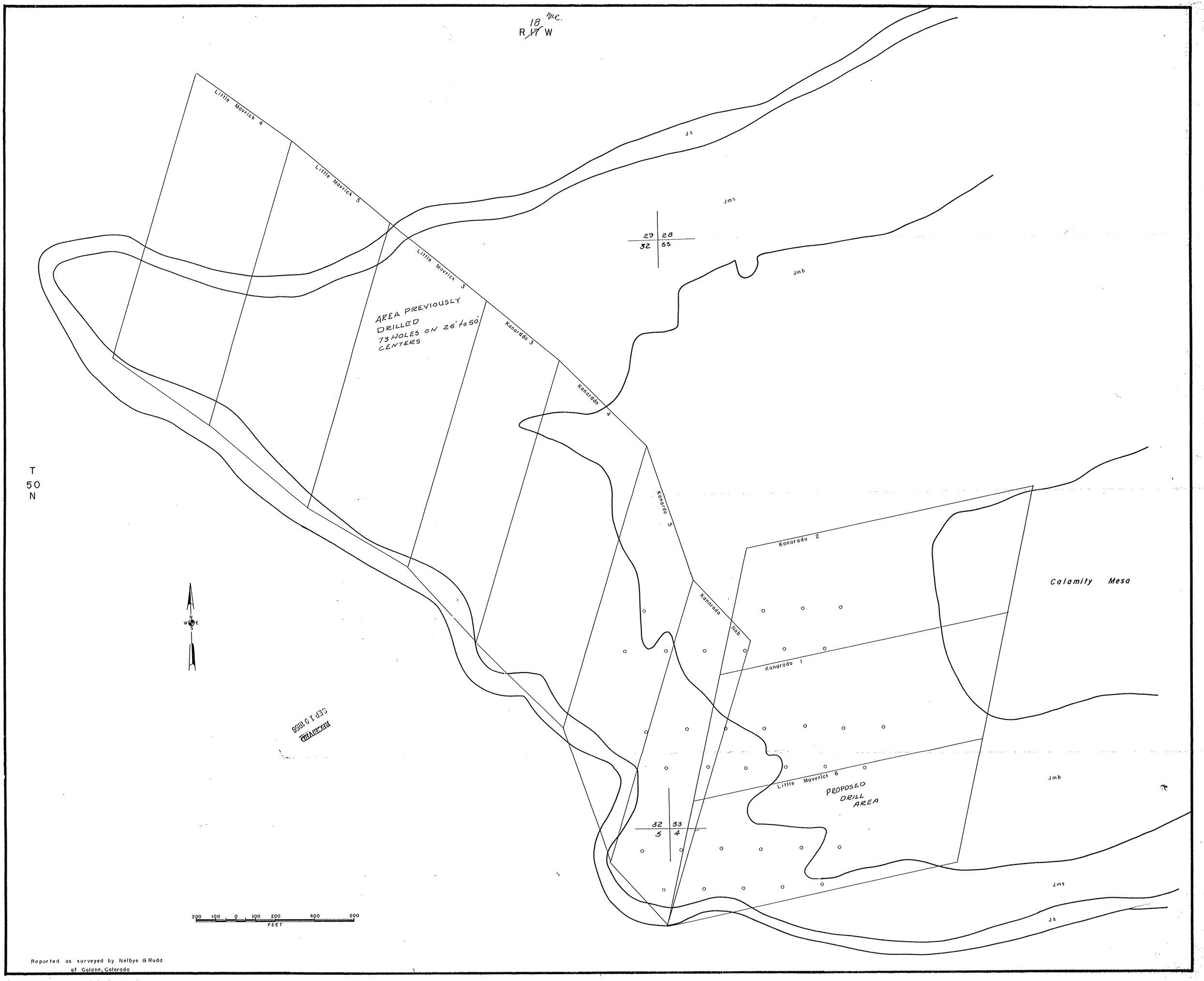
1. Use blocks consecutively, one at a
2. Void previous block.
3. Write clearly.

NAME OR TITLE OF PERSON, DEPARTMENT, ADDRESS, AND ROOM		NAME OR TITLE OF PERSON, DEPARTMENT, ADDRESS, AND ROOM	
Mr. Ellis 4443 Int.	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP
	RUN STOP		RUN STOP

Send surplus envelopes to supply room for reissue.

Use other side

Use RUN and STOP only when messenger service between Government buildings in Washington is required. Your mail room has RUN and STOP information.



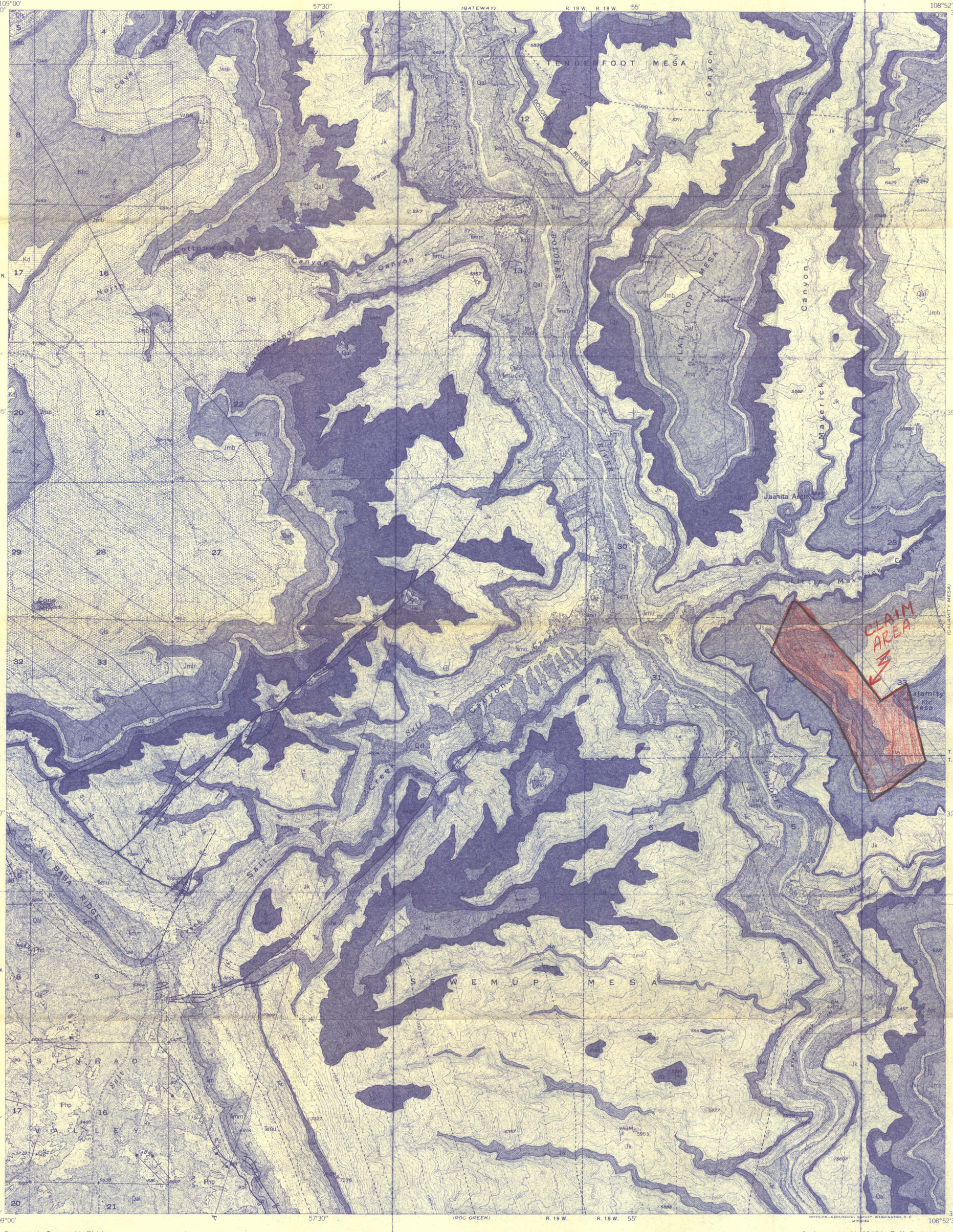
Claim Map of Chipeta Uranium Corp's - Calamity Mesa - Juanita Arch - Mesa County, Colorado

RECEIVED
SEP 1 9 1956

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
W. E. WRATHER, DIRECTOR

PREPARED IN COOPERATION WITH THE
U. S. ATOMIC ENERGY COMMISSION
COLORADO GEOLOGICAL SURVEY BOARD
AND COLORADO METAL MINING FUND BOARD

GEOLOGY OF THE
JUANITA ARCH QUADRANGLE
COLORADO
GQ 81



EXPLANATION

QUATERNARY — Pleistocene and Recent

Qal — Alluvium
Includes colluvium, talus, sheet wash, windblown deposits, valley fill, and stream deposits, undifferentiated.

Qt — Terrace gravel

Qls — Landslide deposits

UNCONFORMITY

CRETACEOUS — Lower and Upper Cretaceous

Kd — Dakota sandstone
Red and brown thin-bedded conglomeratic sandstone.

UNCONFORMITY

Lower Cretaceous

Kbc — Burro Canyon formation
White, gray, and red sandstone and conglomerate with interbedded green and purplish shale.

JURASSIC — Upper Jurassic

Jmb, Jms — Morrison formation
Variegated shale and mudstone; white, gray, rusty-red, and buff sandstone; rusty-red conglomerate; local Ihm limestone beds. At the top the Brushy Basin shale member, Jmb, consisting largely of bentonitic shale but including some sandstone and conglomerate lenses, and at the base the Salt Wash sandstone member, Jms, with more numerous and thicker sandstone beds.

Middle and Upper Jurassic — San Rafael group

Js — Summerville formation
Thin-bedded red, gray, green, and brown sandy shale and mudstone.

Jec — Entrada sandstone and Carmel formation undivided
Orange, buff, and white, fine-grained, massive and cross-bedded Entrada sandstone at the top. Red sandstone and mudstone of the Carmel formation at the base.

UNCONFORMITY

JURASSIC(?) — Glen Canyon group*

Jn — Navajo sandstone
Buff and gray crossbedded, fine-grained sandstone.

Jk — Kayenta formation
Irregularly bedded, red, buff, gray, and lavender fine- to coarse-grained sandstone, siltstone, shale, and limestone- and shale-pebble conglomerate.

Jw — Wingate sandstone
Fine-grained reddish-brown, cliff-forming sandstone, thick-bedded, massive and crossbedded.

TRIASSIC — Upper Triassic

Ꞧc — Chinle formation
Red to orange-red siltstone, with interbedded lenses of red sandstone, shale, and limestone-pebble and clay-pellet conglomerate. Lenses of quartz-pebble conglomerate and grit at base.

UNCONFORMITY

Lower Triassic

Ꞧmu, Ꞧmm, Ꞧml — Moenkopi formation
Chocolate-brown ripple-bedded shale, brick-red sandy mudstone, reddish-brown and chocolate-brown sandstone, and purple and reddish-brown arkosic conglomerate. Local gypsum beds. The upper member, Ꞧmu, consists of thin- and ripple-bedded shale with interbedded sandstone; the middle member, Ꞧmm, consists of ledge-forming beds of shale, sandstone, and arkosic conglomerate; and the lower member, Ꞧml, consists of poorly sorted sandy mudstone and local gypsum beds near base.

UNCONFORMITY

PERMIAN(?)

Pc — Cutler formation
Maroon and purple conglomerate and arkose and red-brown sandy mudstone.

Pr — Rico formation
Red arkose, red-brown mudstone, and gray limestone.

PENNSYLVANIAN

Php — Paradox member of Hermosa formation
At the top, gray fossiliferous limestone member with thin beds of shale, Phl, shown in cross section only; and at the base, sandstone, black shale, gypsum, and salt of the Paradox member, Php.

Contact
Dashed where approximately located.

Indefinite contact
Includes inferred contacts and indefinite boundaries of surficial deposits.

Fault
Dashed where approximately located; dotted where concealed. U, upthrown side; D, downthrown side.

Anticline
Showing trace of axial plane and bearing and plunge of axis; dashed where approximately located.

Concealed anticline

Syncline
Showing trace of axial plane and bearing and plunge of axis; dashed where approximately located.

Concealed syncline

Strike and dip of beds

Strike and dip of beds
In Paradox member of Hermosa formation where strike and dip cannot be precisely measured.

Strike of vertical beds

Horizontal beds

Generalized strike and dip of crumpled beds

Generalized strike of crumpled beds showing direction of dip

Strike of vertical foliation

Structure contours
Drawn on top of Entrada sandstone; short dashes indicate projection above surface; hachured where depressed. Contour interval 100 feet. Datum is mean sea level.

Adit

Prospect

Mine

Since the preparation of this report the age designation of the Glen Canyon group has been changed in U. S. Geological Survey usage to Triassic and Jurassic; the age designation of the Wingate sandstone has been changed to Triassic; and the age designation of the Navajo sandstone has been changed to Jurassic.

Base map by Topographic Division
U. S. Geological Survey, 1949

Geology mapped in 1949 by E. M. Shoemaker
F. W. Cater, Jr., and E. J. McKay

APPROXIMATE MEAN DECLINATION, 1955
TRUE NORTH
MAGNETIC NORTH
15°

GEOLOGIC MAP
OF THE
JUANITA ARCH QUADRANGLE, COLORADO

By
Eugene M. Shoemaker

Scale 1:24000

1 ½ 0 1 Mile

Contour interval 20 feet
Datum is mean sea level

1955

URANIUM PROSPECTOR SERVICE
503 Rood Ave.
Grand Junction, Colo.