MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 47

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

Not to be filled in by applicant

Docket No. DMEA 3974
Metal or Mineral Uranium
Date Received 9-9-55
Estimated Cost $102,786.50
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: Western Gold & Uranium, Inc., Box 27, Leeds, Utah. Incorporated under laws of Nevada.
President, Ralph G. Brown, 42 Broadway, New York 4, N.Y.
Vice Pres. and Treas. David P. Shirra, Grand Canyon, Arizona
Secretary, Darene Backus

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

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

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

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

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

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

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise The company controls the mineral rights of the first two properties under purchase agreements. The company owns the mineral rights on the second two properties.

(*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. Attached hereto: Copies of Beal and Savage agreements.

(*e*) If you own the land, describe any liens or encumbrances on it No liens or encumbrances.

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

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.

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See supplementary sheet attached for answers to questions 4(a) to 4(e), inclusive

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

(*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. Maps attached. 1. Proberty map. 2. Proposed work.

(*c*) The work will start within 60 days and be completed within 18 months from the date of an exploration project contract.

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

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. Attached.

(*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.). See supplementary sheet attached.

(*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. See supplementary sheet attached

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

(*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. See supplementary sheet attached.

(*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. See supplementary sheet attached.

(*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. Attached.

(*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. See supplementary sheet attached.

(*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. See supplementary sheet attached.

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

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

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated August 31, 1955

WESTERN GOLD & URANIUM, INC.
(Applicant)

By Ralph G. Brown
Pres

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

M F 103 Supplementary

Re: Questions 3(a) and 3(f)

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3 (a) Land on which we wish to explore: NE¼,SE¼,Sec.6,T41S,R13W.
NW¼,SE¼,Sec. 6, T41S,R13W (W.G.&J. has mineral rights under purchase agreement)
NW¼,NW¼,SE¼,SW¼,Sec.6,T41S,R13W. S½,S½,NW¼,SE¼,SW¼,Sec.6, T41S,R13W (W.G.&J. owns mineral rights)
Also the following unpatented claims:

		Book	Page No.
In Sec. 6, T41S,R13W:			
	Harris No. 3	X24	388
	Harris No. 4	X24	388
	Harris No. 5	X24	389
	Harris No. 6	X24	389
	Harris No. 7	X24	389
	Harris No. 8	X24	390
	Harris No. 9	X24	390
	Harris No. 10	X24	391
	Wyman No. 3	X24	457
In Sec. 1,T41S,R14W:			
	Harris No. 1	X24	387
	Harris No. 2	X24	388
	Harris No. 4	X24	388
	Ralph No. 1	X24	395
	Ralph No. 2	X24	395
	Ralph No. 3	X24	395
	Ralph No. 4	X24	395
	Ralph No. 5	X24	396
	Ralph No. 6	X24	396
	Ralph No. 7	X24	397
	Angelica No. 1	X24	463
	Angelica No. 2	X24	463
	Angelica No. 3	X24	464

3 (f) See above: 3 (a)

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MF-103 Supplementary Sheet re Questions 4(a) to 4(e), inclusive.

4 (a) No mining operations were performed on the above land. On the adjacent land to the south, 43,000 feet of wagon drilling were performed and 10,000 feet of rotary drilling, which blocked out 34,800 tons of ore running .10% U_3O_8, 11.00 oz. Ag., .50% Cu. and .60% V_2O_5.

During 1952, 53, and 54, 641 tons of ore running .315% U_3O_8 were shipped to Marysvale, Utah from the Chloride Chief mine, immediately south. This mine is owned by the company. Workings are accessible.

4 (b) Past production of district:

Unknown tonnage early days (1875-1909) Value, Ag. $8,000,000
1950-1954 Total district production approximately 700 tons of .31% U_3O_8

Ore reserves average .10 U_3O_8 and 11.00 oz. Ag., 34,800 tons.

4 (c) Regarding Geology, Mineralization and Type of Deposit:

Geologic Reasons in favor of Down-Dip Exploration of the Silver Reef Sandstone in its Primary Zone

A. Introduction: Western Gold and Uranium, Inc. has conducted a successful program of exploration for uranium and silver ore bodies at Silver Reef. All of the exploration has been concentrated within the oxidized zone to develop orebodies of the carnotite-type. (meta-tyuyamunite)

The following presentation must necessarily be based on theoretical grounds, and hypothetical reconstruction of the primary ore as based on observation of its oxidized counterpart, as we have little or no data concerning the truly unoxidized ore.

B. Theoretical Considerations: Within the Silver Reef Sandstone, near the nose of the Virgin Anticline, commercially valuable silver and uranium orebodies have been worked. All of these orebodies were found within that part of the Silver Reef member of the Chinle formation that had been bleached, and appears in the outcrop as a buff or grey-green sandstone.

That this is truly an alteration feature and not an original sedimentary facies (as described by Proctor*) can be demonstrated. The progressive alteration of purple clay to a grey-green clay, purple mica to green mica, and pink sandstone to orange and buff sandstone is shown by drill cores.

Cross sections of the drilling done at Silver Reef show the relationship between the amount of alteration of the sandstone and the presence or absence of orebodies. In each case, the individual orebody shows a dual control of fractures and a favorable bed within this alteration halo.

The relation of buff and pale green alteration to orebodies has recently been noted by others at Temple Mountain** and at Big Indian Wash***, both within the Chinle formation. In both cases there also appears to be a fracture control. Both districts are along major anticlines. Both districts had carnotite type ore near the outcrops. Both districts produce pitchblende from a pyritic ore in the primary zone. The principal mineralogic

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Question 4 (c) cont'd

difference is that the Silver Reef contains silver as well as uranium.

All of the uranium ore mined to date, and that developed by the drilling programs, has been found within the carbonaceous trash beds within the buff alteration zone, either replacing plant remains or impregnating the sandstone. Rusty limonite is closely associated with the ore, and in some cases it is plainly pseudomorphous after pyrite. The presence of limonite spots of this type throughout the buff alteration zone suggests that the original mineralization was more widespread than indicated by present known orebodies.

In reconstructing the primary ore from the oxidized remains, it is reasonable to believe that uranium ores were widespread throughout the sandstone as pitchblende, as in the areas aforementioned, with the same distribution as the pyrite. During oxidation following the erosion of the Virgin Anticline there was a partial leaching of uranium, and reprecipitation within the beds containing carbonaceous debris where the proper reducing conditions were maintained. The relationship between the valence states of uranium and the oxidation potential was explained by R. M. Garrels* (4) at the G.S.A. in Los Angeles, November 1954, and the above would appear to fit the conditions.

From our drilling in the area there appear to be three conditions of the mineralized zone, reasons for which are understood:

1. Zone of oxidation above water table: This is the zone of vadose circulation, with some downward circulation during wet weather, but probably never saturated. The presence of silver, uranium, and copper within this zone is controlled by the presence of suitable carbonaceous debris in the vicinity of through-going fractures. Silver may or may not be associated with carbon.
2. Zone of seasonal fluctuations of the water table. Within this zone there is the poorest chance of finding ore because the water table is constantly moving and actively flushing and colloids or minerals taken into solution. Solution from the primary zone would occur at times of low water table, and reprecipitation near the high water mark would occur to some degree even today. The zone itself would contain only low grade secondary mineralization. Within the zone, however, the residual primary features of the ore attest to a primary mineralization on the same order as those above this zone. The zone of fluctuation is believed to be on the order of 40' vertically.

   The AEC drilled a line of holes on the White Reef which were all the same distance back of the outcrop and all were drilled into this zone. Copper mineralization was heavy in many holes, and the alteration zone and presence of pyrite pseudomorphs showed the nature of the original mineralization.

   Oxidized conditions will persist through this zone and for some distance below.
3. Zone of unoxidized ores: Below the zone of fluctuating water table, there must exist a zone of stagnant water in which reducing conditions are maintained constantly, and in which

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Question 4 (c) cont'd

the uranium, silver, and copper exist in their primary orebodies. Uranium would be present in its lower valence forms, probably as pitchblende, vanadium as montrosite, silver as argentite, copper as chalcopyrite or bornite. Such ores have been found in several other localities of strikingly similar geologic setting and mineralogy.

6. Practical Considerations: The experience of other districts is that the primary orebodies are more uniform and larger in size than carnotite oreshoots. A drilling program to intercept the mineralized zone at 450 feet is believed to be a satisfactory approach. Because of the relationship of ore to alteration, the first step would be a line of holes to give a section from which offset holes could be spotted. The spacing on the first line of deep holes should be no more than 200'. The program would thus have a two-fold purpose: first, to prove the existance and type of ore mineralization within the unoxidized zone. Secondly, to locate orebodies within that zone using the data from the first holes to locate others.

We cannot demonstrate the actual existance of pitchblende ores as described above, because of the lack of deep exploration. However, there appears to be a very good chance for such ores on this property, and based on the theoretical application of data gathered from the oxidized zone, the chance appears to be good enough to warrant the expense of drilling a series of holes to test the theoretical and practical aspects of the property.

Accompanying this application are two maps. One showing property lines and one showing the outcrops of Silver Reef Sandstone, dip, previous work, and proposed drill holes of this program totalling 25,000 feet. Offset holes on any ore found will be financed by the company.

Richard V. Wyman

* Proctor, Paul D. "Geology of the Silver Reef (Harrisburg) Mining District", Utah Geol. and Min. Sur. Bull.44, (1953)

** Kerr, Paul F., et al, "Collapse features at Temple Mountain, Utah" Abst. of paper presented at 1955 Annual Meeting of AIME at Conrad Hilton Hotel, Chicago, Feb.14-17, 1955

*** Isachsen, Y. Wm., "Uranium Deposits, Big Indian Wash-Lisbon Valley Area, San Juan County, Utah" Abst. of paper presented at 67th annual meeting of G.S.A., Statler Hotel, Los Angeles, No. 1-3, 1954

*(4) Garrels, R. M., "Thermodynamic Relations amoung the Uranium Oxides and their relations to oxidation states of the uranium ores of the Colorado Plateaus" Abst. of paper presented to 67th annual meeting of G.S.A., Los Angeles, Nov. 1-3, 1954.

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Question 4 (d)

4 (d) Entire project area is within 2 miles of US91, a paved highway.
Distance to Cedar City, 35 miles, nearest railroad.
Distance to St. George, 17 miles.
Distance to Hurricane, 14 miles.
Distance to Leeds, 2 miles.

4 (e) Manpower supply available locally. Most materials available locally except drill bits, and machine parts which come from Salt Lake or Grand Junction.

The company owns a 15 ac. ft. primary water right.
Southern Utah Power services the area.

5 (d) Operating experience of company:
3½ years operation in exploration and mining at Silver Reef.
Operating experience of supervisors:
Richard V. Wyman, Geologist
2 years geologist New Jersey Zinc Co. exploration division supervising diamond drilling contractors and labor in Big Bug district and Verde district of Arizona.
2 years geologist Cerro de Pasco Corp, 9 months geologist-in-charge Cerro mine, supervising 70 Indians and 5 geologists.
1 3/4 years geologist Western Gold & Uranium, Inc.; supervision of exploration activities, wagon drilling and rotary drilling.

MF-103 Supplementary
Question 6 (a)

6 (a) Independent Contracts: Bulldozer operation - to make roads and prepare drill sites for 50 holes - estimated time required - 200 hrs. @ 8.00 — 1,600.00

6(b) Labor, Supervision & Consultants: All costs based on actual progress records in comparable formations - it is estimated that an average advance of 20' per shift can be maintained throughout the25,000 foot program, thus requiring 1250 shifts, or approximately 16 months.

1. Combination superintendent - Geologist @ 600.00 per month x 16	9,600.00
3. Driller per shift @ 13.85 x 1250	17,312.50
3. Helpers per shift @ 13.00 x 1250	16,250.00
1. Mechanic @ 400.00 per month	6,400.00

6(c) Operating Materials & Supplies

Gasoline - 40 gallons per shift 40x1250x.272	13,600.00
Lub Oil 1 gallon per shift 1x1250x.86	1,075.00
Grease 1000 pounds @ 1.75	175.00
Drill steel replacement - 500 feet 2.64/ft.	1,320.00
Tri cone bits - 8000 feet @ .20	1,600.00
Diamond bits - 1700 feet @ .15	2,550.00
Co Core barrels - 6 : 160.00	960.00
Drilling media - 50 tons Bentonite @ 20.00	1,000.00
Electric power for pumping water	500.00

6 (d) Operating Equipment - to be furnished by operator

1. Rotary drill	18000		
2. Water trucks	3000		
1. Utility truck	1000		
Shop equipment	1000	23,000.00	
Suggested use allowance - 1.00 per hour 1250 shiftsx8hrs.x1.00			10,000.00

6 (e) Rehabilitation & Reapirs - None

6 (f) New Buildings, Improvements, Installations - None

6 (g) Miscellaneous

Anticipated Rotary Drill repairs	
2 replacement motors @ 250.00	500.00
Sludge pump replacement parts	1,500.00
Replacement parts for rotary table	1,000.00
Miscellaneous repairs, gears, universals, shafting, hoist parts and cable	1,000.00
Water truck maintenance, tires, tubes and repairs	1,500.00
Analylical work in operators laboratory	1,000.00
Accounting	500.00
Workmen's compensation	1,000.00
Pay roll taxes, employment insurance & 2% company share S.S.	1,500.00

6 (h) Contingencies

Plus 10% to cover errors in estimation	9,344.00
Total	$102,786.50

A G R E E M E N T

THIS AGREEMENT, made and entered into in triplicate this 26 day of May, 1954, by and between, DAVID GLENN BEAL and WILMA C. BEAL, husband and wife, of Leeds, Utah, parties of the first part, hereinafter called the sellers and WESTERN GOLD AND URANIUM, INC., a corporation, with operating office at Leeds, Washington County, Utah, party of the second part, hereinafter called the buyer, WITNESSETH:

WHEREAS, the sellers are the owners of that certain real property hereinafter particularly described, together with the minerals and mineral rights therein and desire to sell and transfer the said minerals and mineral rights to the buyer for the consideration and pursuant to the terms hereinafter set forth, and the buyer desires to purchase and acquire said minerals and mineral rights pursuant to said terms,

NOW, THEREFORE, the sellers, in consideration of the premises and of the promises and covenants on the part of the buyer as hereinafter contained, hereby agree to sell, convey, transfer, and set over to the said buyer and the buyer agrees to purchase on the terms hereinafter set forth, all of the minerals and mineral rights of every kind in, upon, and under that certain tract of land hereinafter particularly described, owned by the sellers and situate in Washington County, State of Utah; together with all rights of way, easements, and appurtenances, including such use of the surface of said land as may be necessary for the extraction and removal of ore and minerals therefrom, it being understood and agreed, however, that there shall be no surface blasting within 500 feet of any present buildings nor upon any presently cultivated land, and further provided that all surface rights are removed and no mining or exploration activity will be carried on upon the surface of the following tract of the hereinafter described land: Beginning at a point on the South boundary fence, 120 feet S60° E from the Southeast corner of the present house, thence approximately 250' N 35° W, thence N 80° W to the West boundary fence.

Said real property is particularly described as follows, to-wit:

PARCEL 1: The Northwest Quarter of the Southeast Quarter (NW¼SE¼) of Section 6, Township 41 South, Range 13 West, Salt Lake Meridian, containing 40 acres, more or less;

PARCEL 2: Lot 9 in the Southwest Quarter of the Southeast Quarter of Section 6, Township 41 South, Range 13 West, Salt Lake Meridian, containing 15 acres, more or less.

Said minerals and mineral rights in said property to be sold to the buyer herein for the purchase price of Three Thousand ($3,000.00) Dollars, lawful money of the United States of America, payable as follows: Five Hundred ($500.00) Dollars paid by the buyer to the sellers upon the execution of this agreement, the receipt whereof is hereby acknowledged by the sellers. The balance of $2500.00 to be paid by the buyer to the sellers from the sale of the production of ore and minerals from said property, at the rate of Ten (10%) per cent of the net smelter returns therefrom and with a minimum guarantee of payments as follows: Not less than $500.00 on or before December 1, 1954, and a like sum each six months thereafter until the entire purchase price has been fully paid. No interest shall be charged on deferred balances provided the payments called for herein are made upon the day whereon the same are due and payable.

It is further understood and agreed by and between the parties hereto as follows:

1. That upon the execution of this agreement, and thereafter while the same remains in good standing, and until a breach or default by the buyer, the buyer shall be entitled to the exclusive possession of said minerals and mineral rights, rights of way, easements, and appurtenances, including the right to use such part of the surface of said land as shall be necessary in the extraction and removal of ore and minerals therefrom and to enjoy and receive all of the income and profits thereof, subject to the provisions hereof; that upon the happening of any breach, the sellers shall have the right to re

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

possession of said property, including all minerals and mineral rights and mineral and sub-surface rights therein and to cancel and to rescind this agreement and to terminate the same and to nullify the rights of the buyers herein and hereunder, in and to said property and to hold and retain all payments theretofore made by the buyers as rental and liquidated damages for the breach hereof, and to resume possession of said premises and property, and to remove and expell the buyer and all persons holding under it, either with or without legal process, or to pursue such other remedy as may be available to the sellers under the law, provided, that the sellers shall first give the buyers at least thirty (30) days written notice of their intention so to do, setting forth in detail wherein the said buyer is in default of its covenants and agreements herein contained, and if, during said thirty day period the buyer shall perform all of his covenants and agreements wherein it is in default, it shall thereby restore this agreement to good standing in the same manner as if no default had occurred.

2. That upon thirty (30) days written notice from the buyer addressed to the sellers at Leeds, Utah, the buyer may terminate this agreement and thereby be exonerated from any further liability hereunder, except for payments then accrued and owing, provided, however, that any payments theretofore made by the buyer to the sellers shall be forfeited to the sellers as rental and liquidated damages pursuant to the provisions hereof.

3. That the buyer shall have the right, and the same is hereby given by the sellers, to undertake and complete such exploration of said claims as it may desire and to authorize such explorations by the Atomic Energy Commission or other Government Agency, and the sellers further agree that the buyer shall have the right and permission is hereby granted by the sellers to the buyer to place a lien against or otherwise encumber any production from said claims resulting from such explorations of said Government Agency, as security for any loans from the Atomic Energy Commission or other Government Agency.

4. That the buyer shall well and faithfully complete all assessment work required by State or Federal Law to maintain the said claims in good standing during the continuance of this agreement, all of which work shall be completed at the expense of the buyer. The buyer further agrees to file, in a timely manner, any and all proofs of labor of affidavits in lieu thereof which shall or may be required pursuant to law, and to bear and pay all of the expenses thereof.

5. That the buyer shall be entitled to claim and have all depletion credit allowed by the Bureau of Internal Revenue incident to the production and sale of ore from said property during the continuance of this agreement.

6. That simultaneously with the tender of the full purchase price hereof, the sellers agree to execute and deliver to the buyer a good and sufficient mineral deed of conveyance of said minerals and mineral rights in said real property, including such use of the surface of said land as may be necessary, with warranty of title and freedom from encumbrances, said deed to particularly describe said property by full legal description. The said sellers further agree, at their expense, to furnish to the buyer a good and sufficient abstract of title brought down to the date of the execution of this agreement showing the title to said minerals and mineral rights vested in the sellers in a marketable condition. The buyer, may, at its option, procure said abstract and deduct the reasonable cost thereof from the final installment on the purchase price hereof, it being understood, however, that in the event the buyer shall elect to terminate this agreement pursuant to the provisions of paragraph 2 hereof, it shall be responsible for and pay the cost of said abstract. The buyer, at its option and expense, may cause said abstract to be examined by a competent attorney and the sellers agree to forthwith clearup any defects, liens, and encumbrances existing against the title to the said minerals and mineral rights.

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7. That the buyer will take good and sufficient care of said minerals and mineral rights in said property during his occupancy thereof, so long as there remains unpaid any balance of the purchase price hereof, and will mine the same according to good mining practice, and that it will not do or wilfully suffer to be done upon said premises or in connection therewith anything that will reduce the value thereof (excepting the extraction of ore) or impair the security of the sellers. That it will preserve all water rights, easements, rights of way, and appurtenances, if any, thereunto belonging and will not allow the commission of waste thereon, or unduly interfer with nor obstruct the sellers in the use of the surface of said property.

8. It is expressly understood and agreed by and between the parties hereto that the buyer accepts the said minerals and mineral rights in said property in their present condition, except as in regard to the condition of the title of the sellers thereto and that there are no representations, covenants, or agreements between the parties hereto except as herein specifically setforth.

9. That the buyer will keep and maintain full, true, and correct records of all production and/or marketing of ore, which records will be opened at all reasonable times for inspection by the sellers, and will render to the sellers regular reports of the net smelter proceeds of all ore mined, smelted, and sold.

10. It is mutually understood and agreed by and between the parties hereto that the rights of way and easements referred to herein which are granted by the sellers to the buyers for gaining access to the said property for mining purposes shall be located at the points and on the routes designated by the sellers, the location thereof to be at such points as will result in the minimum damage to the sellers crops and require the minimum expense on the part of the buyer in making them traversable, and the buyer agrees to pay the reasonable damage to any crops of the sellers arising from the use or improvement of such rights of way and easements.

11. That time and the prompt and faithful performance of each and every obligation of the buyer and the sellers are of the very essence of this agreement.

12. That this agreement shall be binding upon and shall enure to the benefit of the heirs, representatives, successors, and assigns of the respective parties hereto, and that the party hereto found to be in default of any of the material provisions hereof shall pay and discharge all costs, expenses, and a reasonable attorneys fee incurred by the innocent party in enforcing or defending the provisions hereof or in suing for a breach of this agreement.

13. That the buyer, in consideration of the premises and of the covenants on the part of the sellers as herein contained, hereby accepts and agrees to the above terms and conditions and agrees to pay the sums provided above in the manner and at the time set forth.

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

David Glenn Beal

Shirma C. Beal

Sellers, parties of the first part

WESTERN GOLD AND URANIUM, INC.,
a Corporation

David P Shirra

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

On this 26 day of May, 1954, personally appeared before me David Glenn Beal and Wilma C. Beal, husband and wife, two of the signers of the foregoing instrument, who duly acknowledges to me that they executed the same.

Notary Public

My Commission Expires July 15, 1954 Residing at St. George Utah

STATE OF Utah)
: ss
COUNTY OF Washington)

On this 26 day of May, 1954, personally appeared before me David P. Shirra, who being by me duly sworn, did say that he is the Vice-president and Treasurer of Western Gold and Uranium, Inc., a corporation, and that said instrument was signed in behalf of said corporation by authority of its by-laws and resolution of its board of directors, and the said David P. Shirra acknowledged to me that said corporation executed the same.

Notary Public

My Commission Expires July 15, 1954 Residing at St. George Utah

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

A G R E E M E N T

THIS AGREEMENT, made and entered into in triplicate, this 7 day of April, 1954, by and between RILEY C. SAVAGE and IVA ROSS SAVAGE, husband and wife, of Leeds, Washington County, State of Utah, parties of the first part, hereinafter called the sellers, and WESTERN GOLD AND URANIUM, INC., a corporation, with operating office at Leeds, Washington County, Utah, party of the second part, hereinafter called the buyer, WITNESSETH:

WHEREAS, the sellers are the owners of that certain real property hereinafter particularly described, together with the minerals and mineral rights therein and desire to sell and transfer the said minerals and mineral rights to the buyer for the consideration and pursuant to the terms hereinafter set forth, and the buyer desires to purchase and acquire said minerals and mineral rights pursuant to said terms.

NOW, THEREFORE, the sellers, in consideration of the premises and of the promises and covenants on the part of the buyer as hereinafter contained, hereby agree to sell, convey, transfer, and set over to the said buyer and the buyer agrees to purchase on the terms hereinafter setforth, all of the minerals and mineral rights of every kind in, upon, and under that certain tract of land hereinafter particularly described owned by the sellers and situate in Washington County, State of Utah; together with all rights of way, easements and appurtenances, including such use of the surface of said land as may be necessary for the extraction and removal of ore and minerals therefrom. Said real property is particularly described as follows, to-wit:

> The Northeast Quarter of the Southeast Quarter (NE¼SE¼) of Section 6, Township 41 South, Range 13 West, Salt Lake Meridian, containing 40 acres, more or less.

Said minerals and mineral rights in said property to be sold to the buyer herein for the purchase price of Two Thousand ($2,000.00) Dollars, lawful money of the United States of America, payable as follows: Two Hundred ($200.00) Dollars paid by the buyer to the sellers upon the execution of this agreement, the receipt whereof is hereby acknowledged by the sellers. The balance of Eighteen Hundred ($1800.00) Dollars to be paid by the buyer to the sellers from the sale of the production of ore and minerals from said property, at the rate of Ten (10%) per cent of the net smelter returns therefrom, and with a minimum guarantee of payments as follows: Not less than $200.00 on or before one year from date and a like sum on or before the anniversary date hereof thereafter until the entire purchase price has been fully paid. No interest shall be charged on deferred balances provided the payments called for herein are made upon the day whereon the same are due and payable.

It is further understood and agreed by and between the parties hereto as follows:

1. That upon the execution of this agreement, and thereafter while the same remains in good standing, and until a breach or default by the buyer, the buyer shall be entitled to the exclusive possession of said minerals and mineral rights, rights of way, easements, and appurtenances, including the right to use such part of the surface of said land as shall be necessary in the extraction and removal of ore and minerals therefrom and to enjoy and receive all of the income and profits thereof, subject to the provisions hereof; that upon the happening of any breach, the sellers shall have the right to resume possession of said property, including all minerals and mineral rights and mineral andsub-surface rights therein and to cancel and to rescind this agreement and to terminate the same and to nullify the rights of the buyer herein and hereunder, in and to said property and to hold and retain all payments theretofore made by the buyer as rental and liquidated damages for the breach hereof, and to resume possession of said premises and property, and to

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ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
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remove and expell the buyer and all persons holding under it, either with or without legal process, or to pursue such other remedy as may be available to the sellers under the law, provided, that the sellers shall first give the buyer at least thirty (30) days written notice of their intention so to do, setting forth in detail wherein the said buyer is in default of its covenants and agreements herein contained, and if, during said thirty day period the buyer shall performall of his covenants and agreements herein it is in default, it shall thereby restore this agreement to good standing in the same manner as if no default had occurred.

2. That upon thirty (30) days written notice from the buyer addressed to the sellers at Leeds, Utah, the buyer may terminate this agreement and thereby be exonerated from any further liability hereunder, except for payments then accrued and owing, provided, however, that any payments theretofore made by the buyer to the sellers shall be forfeited to the sellers as rental and liquidated damages pursuant to the provisions hereof.

3. That the buyer shall have the right, and the same is hereby given by the sellers, to undertake and complete such exploration of said claims as it may desire and to authorize such explorations by the Atomic Energy Commission or other Government Agency, and the sellers further agree that the buyer shall have the right and permission is hereby granted by the sellers to the buyer to place a lien against or otherwise encumber any production from said claims resulting from such explorations of said government Agency, as Security for any loans from the Atomic Energy Commission or other Government Agency.

4. That the buyer shall well and faithfully complete all assessment work required by State or Federal Law to maintain the said claims in good standing during the continuance of this agreement, all of which work shallbe completed at the expense of the buyer. The buyer further agrees to file, in a timely manner, any and all proofs of labor or affidavits in lieu thereof which shall or may be required pursuant to law, and to bear and pay all of the expenses thereof.

5. That the buyer shall be entitled to claim and have all depletion credit allowed by the Bureau of Internal Revenue incident to the production and sale of ore from said property during the continuance of this agreement.

6. That simultaneously with the tender of the full purchase price hereof, the sellers agree to execute and deliver to the buyer a good and sufficient mineral deed of conveyance of said minerals and mineral rights in said real property, including such use of the surface of said land as may be necessary, with warranty of title and freedom from encumbrances, said deed to particularly describe said property by full legal description. The said sellers further agree, at their expense, to furnish to the buyer a good and sufficient abstract of title brought down to the date of the execution of this agreement showing the title to said minerals and mineral rights vested in the sellers in a marketable condition. The buyer, may at its option, procure said abstract and deduct the reasonable cost thereof from the final installment on the purchase price hereof, it being understood, however, that in the event the buyer shall elect to terminate this agreement pursuant to the provisions of paragraph 2 hereof, it shall be responsible for and pay the cost of said abstract. The buyer, at its option and expense, may cause said abstract to be examined by a competent attorney and the sellers agree to forthwith clearup any defects, liens, and encumbrances existing against the title to the said minerals and mineral rights.

7. That the buyer will take good and sufficient care of said minerals and mineral rights in said property during his occupancy thereof, so long as there remains unpaid any balance of the purchase price hereof, and will mine the same according to good mining practice, and that it will not do or wilfully suffer to be done upon said premises or in connection therewith anything that will reduce the value thereof (excepting the extraction of ore)or impair the

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COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

security of the sellers. That it will preserve all water rights, easements, rights of way, and appurtenances, if any, thereunto belonging and will not allow the commission of waste thereon, or undul interfer with nor obstract the sellers in the use of the surface of said property.

8. It is expressly understood and agreed by and between the parties hereto that the buyer accepts the said minerals and mineral rights in said property in their present condition, except as in regard to the condition of the title of the sellers thereto and there are no representations, covenants, or agreements between the parties hereto except as herein specifically set forth.

9. That the buyer will keep and maintain full, true, and correct records of all production and/or marketing of ore, which records will be opened at all reasonable times for inspection by the sellers, and will render to the sellers regular reports of the net smelter proceeds of all ore mined, smelted, and sold.

10. That time and the prompt and faithful performance of each and every obligation of the buyer and the sellers are of the very essence of this agreement.

11. That this agreement shall be binding upon and shall enure to the benefit of the heirs, representatives, successors, and assigns of the respective parties hereto, and that the party hereto found to be in default of the material provisions hereof shall pay and discharge all costs, expenses, and a reasonable attorneys fee incurred by the innocent party in enforcing or defending the provisions hereof or in suing for a breach of this agreement.

12. That the buyer, in consideration of the premises and of the covenants on the part of the sellers as herein contained, hereby accepts and agrees to the above terms and conditions and agrees to pay the sums provided above in the manner and at the time set forth.

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

Eva Ross Savage
Riley C. Savage
Sellers, parties of the first part

WESTERN GOLD AND URANIUM, INC.,
A Corporation

David P. Sierra

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

On this 7 day of April, 1954, personally appeared before me Riley C. Savage and Eva Ross Savage, husband and wife, two of the signers of the foregoing instrument, who duly acknowledged to me that they executed the same.

Rodney Nelson
Notary Public

My Commission Expires July 15, 1954 Residing at St. George, Utah

State of Utah)
: ss
County of Washington)

On this 29 day of April, 1954, personally appeared before

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

David P. Shirra, who being by me duly sworn, did say that he is the Vice-President and Treasurer of Western Gold and Uranium, Inc., a corporation, and that said instrument was signed in behalf of said corporation by authority of its by-laws and resolution of its board of directors, and the said David P. Shirra acknowledged to me that said corporation executed the same.

Notary Public

My Commission Expires July 15, 1954 Residing at St. George, Utah

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

A G R E E M E N T

THIS AGREEMENT, made and entered into in triplicate, this 23 day of July, 1953, by and between RILEY C. SAVAGE and EVA ROSS SAVAGE, husband and wife, of Leeds, Utah, parties of the first part, hereinafter called the Sellers and WESTERN GOLD MINES, INC., a corporation, with operating office at Leeds, Washington County, Utah, party of the second part hereinafter called the Buyer, WITNESSETH:

WHEREAS, the Sellers are the owners of that certain real property hereinafter particularly described, together with the minerals and mineral rights therein and desire to sell and transfer the said minerals and mineral rights to the Buyer for the consideration and pursuant to the terms hereinafter set forth, and the Buyer desires to purchase and acquire said minerals and mineral rights pursuant to said terms.

NOW, THEREFORE, the Sellers, in consideration of the premises and of the promises and covenants and on the part of the Buyer as hereinafter contained, hereby agree to sell, convey, transfer, and set over to the said Buyer and the Buyer agrees to purchase on the terms hereinafter setforth, all of the minerals and mineral rights of every kind in, upon, and under those certain tracts of land hereinafter particularly described owned by the Sellers and situate in Washington County, State of Utah; together with all rights of way, easements, and appurtenances, including such use of the surface of said land as may be necessary for the extraction and removal of ore and minerals therefrom. Said real property is particularly described as follows:

The SE¼ SE¼ of Section 6, Township 41 South, Range 13 West, S.L.M., containing 40 acres, more or less;

ALSO

The W½ SW¼ SE¼; the SE¼ SW¼; and the SW¼ SW¼ of Section 5, Township 41 South, Range 13 West, S.L.M., excepting approximately 13 acres of the said SW¼ SW¼ of said Section 5 heretofore conveyed by the Sellers herein to A. A. Eastman, leaving a net acreage included in this agreement of approximately 77 acres, more or less, in said Section 5.

Said minerals and mineral rights in said property to be sold to the Buyer herein for the purchase price of Six Thousand ($6,000.00) Dollars, lawful money of the United States of America, payable as follows: One Thousand ($1000.00) Dollars paid by the Buyer to the Sellers upon the execution of this agreement, the receipt whereof is hereby acknowledged by the Sellers. The balance of Five Thousand and no/100 ($5000.00) Dollars to be paid by the Buyer to the Sellers from the proceeds from the sale of the production of ore and minerals from said property, at the rate of Ten (10%) per cent of the net smelter returns therefrom, and with a minimum guarantee of payments as follows: Not less than $500.00 on or before two years from date, and a like sum on or before the anniversary date hereof thereafter until the entire purchase price has been fully paid.

It is further understood and agreed by and between the parties hereto as follows:

1. That upon the execution of this agreement, and thereafter while the same remains in good standing, and until a breach or default by the Buyer, the Buyer shall be entitled to the exclusive possession of said minerals and mineral rights, rights of way, easements, and appurtenances, including the right to use such part of the surface of said land as shall be necessary in the extraction and removal of ore and minerals therefrom and to enjoy and receive all of the income and profits thereof, subject to the provisions hereof; that upon the happening of any breach, the Sellers shall have the right to resume possession of said property, including all minerals and mineral rights and mineral and sub-surface rights therein and to cancel and to rescind this agreement and to terminate the same and to nullify the rights of the Buyer herein

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ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

and hereunder, in and to said property and to hold and retain all payments theretofore made by the Buyer as rental and liquidated damages for the breach hereof, and to resume possession of said premises and property, and to remove and expell the Buyer and all persons holding under it, either with or without legal process, or to pursue such other remedy as may be available to the sellers under the law, provided, that the Sellers shall first give the Buyer at least thirty (30) days written notice of their intention so to do, setting forth in detail wherein the said Buyer is in default of its covenants and agreements herein contained, and if, during said thirty day period the Buyer shall perform all of his covenants and agreements wherein it is in default, it shall thereby restore this agreement to good standing in the same manner as if no default had occurred.

2. That upon thirty (30) days written notice from the Buyer addressed to the Sellers at Leeds, Utah, the Buyer may terminate this agreement and thereby be exonerated from any further liability hereunder, except for payments then accrued and owing, provided, however, that any payments theretofore made by the Buyer to the Sellers shall be forfeited to the Sellers as rental and liquidated damages pursuant to the provisions hereof.

3. That the Buyer shall have the right, and the same is hereby given by the Sellers, to undertake and complete such exploration of said claims as it may desire and to authorize such explorations by the Atomic Energy Commission or other Government Agency, and the Sellers further agree that the Buyer shall have the right and permission is hereby granted by the Sellers to the Buyer to place a lien against or otherwise encumber any production from said claims resulting from such explorations of said Government Agency, as security for any loans from the Atomic Energy Commission or other Government Agency.

4. That the Buyer shall well and faithfully complete all assessment work required by State or Federal Law to maintain the said clims in good standing during the continuance of this agreement, all of which work shall be completed at the expense of the Buyer. The Buyer further agrees to file, in a timely manner, any and all proofs of labor or affidavits in lieu thereof which shall or may be required pursuant to law, and to bear and pay all of the expenses thereof.

5. That the Buyer shall be entitled to claim and have all depletion credit allowed by the Bureau of Internal Revenue incident to the production and sale of ore from said property during the continuance of this agreement.

6. That simultaneously with the tender of the full purchase price hereof, the Sellers agree to execute and deliver to the Buyer a good and sufficient mineral deed of conveyance of said minerals and mineral rights in said real property, including such use of the surface of said land as may be necessary for the extraction and removal of ore and minerals therefrom, with warranty of title and freedom from encumbrances, said deed to particularly describe said property by full legal description.

7. That the Buyer will take good and sufficient care of said minerals and mineral rights in said property during his occupancy thereof, so long as there remains unpaid any balance of the purchase price hereof, and will mine the same according to good mining practice, and that it will not do or wilfully suffer to be done upon said premises or in connection therewith anything that will reduce the value thereof (excepting the extraction of ore) or impair the security of the Sellers. That it will preserve all water rights, easements rights of way, and appurtences, if any, thereunto belonging and will not allow the commission of waste thereon, or unduly interfer with nor obstract the Sellers in the use of the surface of said property.

8. It is expressly understood and agreed by and between the parties hereto that the Buyer accepts the said minerals and mineral rights in said property in their present condition, except as in regard to the condition of the title of the Sellers thereto and there are no representations, covenants, or agreements between the parties hereto except as herein specifically setforth.

9. That the Buyer will keep and maintain full, true, and correct records

IAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

of all production and/or marketing of ore, which records will be opened at all reasonable times for inspection by the Sellers, and will render to the Sellers regular reports of the net smelter proceeds of all ore mined, smelted, and sold.

10. That time and the prompt and faithful performance of each and every obligation of the Buyer and the Sellers are of the very essence of this agreement.

11. That this agreement shall be binding upon and shall enure to the benefits of the heirs, representatives, successors, and assigns of the respective parties hereto, and that the party hereto found to be in default of any of the material provisions hereof shall pay and discharge all costs, expenses, and a reasable attorneys fee incurred by the innocent party in enforcing or defending the provisions hereof or insuing for a breach of this agreement.

12. That the Buyer, in consideration of the premises and of the covenants on the part of the Sellers as herein contained, hereby accepts and agrees to the above terms and conditions and agrees to pay the sums provided above in the manner and at the time setforth.

IN WITNESS WHEREOF, the parties have hereunto set their hands the 29 day of July, 1953.

Riley O. Savage

Eva Ross Savage

Sellers, parties of the first part

ATTEST:

WESTERN GOLD MINES, INC., a corporation

Berene Barkus
Secretary

David P. Shirra
Vice Pres. & Treasurer

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

On this 29 day of July, 1953, personally appeared before me Riley O. Savage and Eva Ross Savage, husband and wife, two of the signers of the foregoing instrument, who duly acknowledged to me that they executed the same.

R. Pendry Nelson
NOTARY PUBLIC

My Commission expires July 15, 1954 Residing at St. George, Utah

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

On this 29 day of July, 1953, personally appeared before me David P. Shirra, who being by me duly sworn, did say that he is the Vice Pres. & Treasurer of Western Gold Mines, Inc., a corporation, and that said instrument was signed in behalf of said corporation by authority of its by-laws and resolution of its board of directors, and the said David P. Shirra acknowledged to me that said corporation executed the same.

R. Pendry Nelson
NOTARY PUBLIC

My Commission expires July 15, 1954 Residing at St. George, Utah

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
31 NORTH MAIN ST.
ST. GEORGE, UTAH

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
3/11/59	Knowlse	700
	Selfridge	120
		110
		100
		220
	DMEA-4575	225

(Incoming letter filed in DMEA-2855
D. B. McGee & A. R. Kleinkauf)

Mr. Arthur E. Granger, Chief
Salt Lake Branch
Production Evaluation Division
Atomic Energy Commission
222 South West Temple, Room 210
Salt Lake City, Utah

Re: FSL:BDimke

Dear Mr. Granger:

In accordance with your request of March 6, we are enclosing copies of the following property on-site examination reports:

DMEA-3882 Knowles Fisher Corporation, Radiant claims, Lemhi County, Idaho

DMEA-3974 Western Gold & Uranium, Inc., Silver Reef Mines, Washington County, Utah

DMEA-4291 Ralph E. Patton, et al., Foolproof claims, Custer County, Idaho

DMEA-4575 Idaho Nevada Uranium Corporation, Queen, et al., claims, Elko County, Nevada

We have requested our Reno, Nevada, office to forward a copy of the on-site examination report for Docket No. DMEA-4501, Kern Uranium Company, Little Sparkler and McTom claims, Kern County, California.

No DMEA reports are available because no on-site examinations were made of the following properties:

DMEA-2855 Allen R. Kleinkauf and Donald B. McGee, Minnie Lee and Fiend group of claims, San Bernardino County, California

DMEA-3759 Fall Creek Uranium Corporation, Inc., claims in Caribou Mountains, Bonneville County, Idaho.

FLKnowlse/gla 3-11-59 Sincerely yours,
cc to: Director's R. File
Operating Committee
FLKnowlse (signed) FRANK E. JOHNSON
Regions I, II, and III, w/cc
incoming letter Acting Director

Enclosures

43683

Surname copy

700

Ching

Selfridge

Fleming

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

MAR 22 1956

Mr. Ralph G. Brown, President
Western Gold & Uranium, Inc.
42 Broadway
New York 4, New York

Re: Docket No. DMEA-3974 (Uranium)
Silver Reef Mines
Washington County, Utah

Dear Mr. Brown:

Reference is made to your letter of March 14, 1956, requesting that we reopen the subject application on the basis of new evidence now available. Also, receipt of Mr. Richard V. Wyman's geological report, dated May 12, 1955, is acknowledged.

Our letter of February 27, 1956, was the result of painstaking study and investigation of your property and constitutes a formal denial of your application. The subject docket has, therefore, been closed, and is no longer open to further processing. Of course, this does not mean that you cannot make a new application on the basis of new and more favorable evidence of ore deposition on the property.

We find, however, that the new evidence submitted in your letter is not sufficiently encouraging to justify consideration as part of a new application. If, through additional work on your part, more substantial evidence of significant mineralization at depth is disclosed, we shall be pleased to hear from you.

Sincerely yours,

O. O. Mitchelmore

Administrator

MChing/gla
3-21-56
cc to: Admr.'s Reading File
Docket
Messrs. JECrawford, Rm. 3641
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA
Code 700, Mr. Ching
DMEA Field Team, Region III (2)

R.G.B.

3-20-56

RECEIVED
MAR 19 1956

WESTERN GOLD & URANIUM, INC.
42 BROADWAY
NEW YORK, 4 N. Y.

WHITEHALL 4-6478

SILVER REEF URANIUM MINES
OFFICE: LEEDS, UTAH

FIRST NATIONAL BANK BUILDING
CARSON CITY, NEVADA

March 14th, 1956

Mr. C. O. Mittendorf, Administrator,
U. S. Department of the Interior,
Defense Minerals Exploration Administration,
Washington, D.C.

Re: Docket No. DMEA 3974 (Uranium)
Silver Reef Mines,
Washington County, Utah.

Dear Mr. Mittendorf:

Answering your letter of February 27, 1956, and with particular reference to paragraph 3, I am pleased to advise you that we have new evidence now indicating the probability of disclosing significant ore reserves at about 400 feet of depth in our Silver Reef property. This new evidence consists of the fact that we have ourselves now completed three diamond drill core holes to this level which have found uranium mineralization with primary ore. One of these holes had ore which assayed .09 U_3O_8, and we believe that we are on the edge of what should be a worth while ore body with higher grade ore than the .09% U_3O_8.

We respectfully therefore request that you reopen our loan application. Perhaps you would like to re-read in our application, "Geologic Reasons in favor of Down Dip Exploration of the Silver Reef Sandstone in its Primary Zone", by our chief geologist, Richard V. Wyman.

We understand that engineers from the U. S. Geological Survey who were on our property a year ago, agree with these geologic reasons given by Mr. Wyman.

Yours very truly,

Ralph G. Brown

Ralph G. Brown,
President.

RGB C

c.c. Mr. Richard V. Wyman,
Western Gold & Uranium, Inc.
Box 27,
Leeds, Utah.

WESTERN GOLD & URANIUM, INC.
SILVER REEF URANIUM MINES
LEEDS, UTAH

42 BROADWAY
NEW YORK 4, N. Y.

FIRST NATIONAL BANK BUILDING
CARSON CITY, NEVADA

RECEIVED
MAR 19 1956

May 12, 1955

Geologic Reasons in favor of Down-Dip Exploration of the Silver Reef Sandstone in its Primary Zone

A. Introduction: Western Gold and Uranium, Inc. has conducted a successful program of exploration for uranium and silver orebodies at Silver Reef. All of the exploration has been concentrated within the oxidized zone to develop orebodies of the carnotite-type. (meta-tyuyamunite)

The following presentation must necessarily be based on theoretical grounds, and hypothetical reconstruction of the primary ore as based on observation of its oxidized counterpart, as we have little or no data concerning the truly unoxidized ore.

B. Theoretical Considerations: Within the Silver Reef sandstone, near the nose of the Virgin Anticline, commercially valuable silver and uranium orebodies have been worked. All of these orebodies were found within that part of the Silver Reef member of the Chinle formation that had been bleached, and appears in the outcrop as a buff or grey-green sandstone.

That this is truly an alteration feature and not an original sedimentary facies (as described by Proctor*) can be demonstrated. The progressive alteration of purple clay to a grey-green clay, purple mica to green mica, and pink sandstone to orange and buff sandstone is shown by drill cores.

Cross sections of the drilling done at Silver Reef show the relationship between the amount of alteration of the sandstone and the presence or absence of orebodies. In each case, the individual orebody shows a dual control of fractures and a favorable bed within this alteration halo.

The relation of buff and pale green alteration to orebodies has recently been noted by others at Temple Mountain** and at Big Indian Wash***, both within the Chinle formation. In both cases there also appears to be a fracture control. Both districts are along major anticlines. Both districts had carnotite type ore near the outcrops. Both districts produce pitchblende from a pyritic ore in the primary zone. The principal mineralogic difference is that the Silver Reef contains silver as well as uranium.

All of the uranium ore mined to date, and that developed by the drilling programs, has been found within the carbonaceous trash beds within the buff alteration zone, either replacing plant remains or impregnating the sandstone. Rusty limonite is closely associated with the ore, and in some cases it is plainly pseudomorphous after pyrite. The presence of limonite spots of this type throughout the buff alteration zone suggests that the original mineralization was more widespread than indicated by present known orebodies.

In reconstructing the primary ore from the oxidized remains, it is reasonable to believe that uranium ores were widespread throughout the sandstone as pitchblende, as in the areas aforementioned, with the same distribution as the pyrite. During oxidation following the erosion of the Virgin Anticline there was a partial leaching of uranium, and reprecipitation within the beds containing carbonaceous debris where the proper reducing conditions were maintained. The relationship between the valence states of uranium and the oxidation potential was explained by R.M.Garrels*(5) at the G.S.A. in Los Angeles, November 1954, and the above would appear to fit the conditions.

From our drilling in the area there appear to be three conditions of the mineralized zone, reasons for which are understood:

1.) Zone of oxidation above water table: This is the zone of vadose circulation, with some downward circulation during wet weather, but probably never saturated. The presence of silver, uranium, and copper within this zone is controled by the presence of suitable carbonaceous debris in the vicinity of through-going fractures. Silver may or may not be associated with carbon.

2.) Zone of seasonal fluctuations of the water table. Within this zone there is the poorest chance of finding ore because the water table is constantly moving and actively flushing and colloids or minerals taken into solution. Solution from the primary zone would occur at times of low water table, and reprecipitation near the high water mark would occur to some degree even today. The zone itself would contain only low grade secondary mineralization. Within the zone, however, the residual primary features of the ore attest to a primary mineralization on the same order as those above this zone. The zone of fluctuation is believed to be on the order of 40' vertically.

The AEC drilled a line of holes on the White Reef which were all the same distance back of the outcrop and all were drilled into this zone. Copper mineralization was heavy in many holes, and the alteration zone and presence of pyrite pseudomorphs showed the nature of the original mineralization.

Oxidized conditions will persist through this zone and for some distance below.

3.) Zone of unoxidized ores: Below the zone of fluctuating water table, there must exist a zone of stagnant water in which reducing conditions are maintained constantly, and in which the uranium, silver, and copper exist in their primary orebodies. Uranium would be present in its lower valence forms, probably as pitchblende, vanadium as montrosite, silver as argentite, copper as chalcopyrite or bornite. Such ores have been found in several other localities of strikingly similar geologic setting and mineralogy.

C. <u>Practical considerations:</u> The experience of other districts is that the primary orebodies are more uniform and larger in size than carnotite oreshoots. A drilling program to intercept the mineralized zone at 450 feet is believed to be a satisfactory approach. Because of the relationship of ore to alteration, the first step would be a line of holes to give a section from which offset holes could be spotted. The spacing on the first line of deep holes should be no more than 200'. The program would thus have a two-fold purpose: first, to prove the existance and type

of ore mineralization within the unoxidized zone. Secondly, to locate orebodies within that zone using the data from the first holes to locate others.

We cannot demonstrate the actual existance of pitchblende ores as described above, because of the lack of deep exploration. However, there appears to be a very good chance for such ores on this property, and based on the theoretical application of data gathered from the oxidized zone, the chance appears to be good enough to warrant the expense of drilling a series of holes to test the theoretical and practical aspects of the property.

Sincerely,

Richard V. Wyman

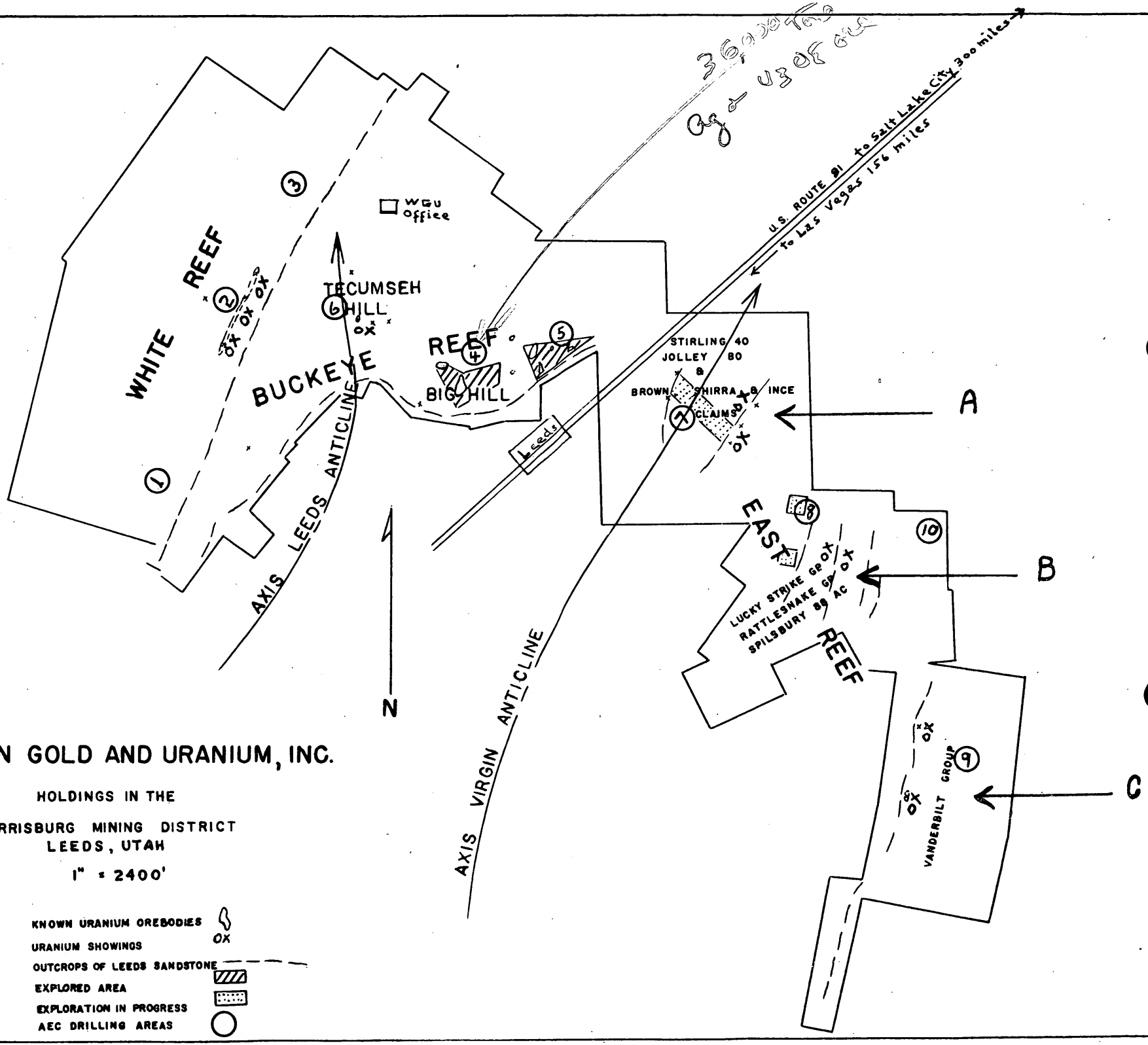
Richard V. Wyman, Geologist
Western Gold and Uranium, Inc.
P.O.Box 27
Leeds, Utah

* Proctor, Paul D. "Geology of the Silver Reef (Harrisburg) Mining District", Utah Geol. and Min. Sur. Bull.44, (1953)

** Kerr, Paul F., et al, "Collapse features at Temple Mountain, Utah" Abst. of paper presented at 1955 Annual Meeting of AIME at Conrad Hilton Hotel, Chicago, Feb.14-17, 1955

*** Isachsen, Y.Wm. "Uranium Deposits, Big Indian Wash-Lisbon Valley Area, San Juan County, Utah" Abst. of paper presented at 67th annual meeting of G.S.A., Statler Hotel, Los Angeles, No. 1-3, 1954

*(5) Garrels, R.M. "Thermodynamic Relations among the Uranium Oxides and their relations to oxidatio states of the uranium ores of the Colorado Plateaus" Abst. of paper presented to 67th annual meeting of G.S.A., Los Angeles, Nov.1-3,1954



WESTERN GOLD AND URANIUM, INC.

HOLDINGS IN THE

HARRISBURG MINING DISTRICT
LEEDS, UTAH

1" = 2400'

KNOWN URANIUM OREBODIES
URANIUM SHOWINGS
OUTCROPS OF LEEDS SANDSTONE
EXPLORED AREA
EXPLORATION IN PROGRESS
AEC DRILLING AREAS

RECEIVED
MAR 19 1956

700

FILE COPY
Surname:
Ching
Gill
Lathon
~~Kilgaard~~
Selbrede
Gilman

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

FEB 27 1956

Western Gold and Uranium, Inc.
Box 27
Leeds, Utah

Re: Docket No. DMEA-3974 (Uranium)
Silver Reef Mines
Washington County, Utah

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 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 Program and for bringing your property to our attention.

Sincerely yours,

C. O. Mitchell

Administrator

MChing/izm 2-20-56
cc to: Docket
Code 700
Mr. Ching
Admr.'s Reading File
Operating Committee
DMEA Field Team, Region III, (2)
Messrs. JECrawford, Rm. 2641
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA

R.C.L.

Docket Copy
700

Ching
Ellis

February 20, 1956

SUMMARY OF PROPOSED PROJECT

Object: Denial of application for an exploration project.

Docket No.: DMEA-3974

Commodity: Uranium

Applicant: Western Gold & Uranium, Inc., A Nevada Corporation
Box 27
Leeds, Utah

Property: 21 unpatented claims; Harris Nos. 1-10, Ralph Nos. 1-7, Angelica Nos. 1-3, and Wyman No. 3 in sec. 6, T. 41 S., R. 13 W., sec. 1, T. 41 S., R. 14 W., sec. 31 T. 40 S., R. 13 W., and sec. 36, T. 40 S., R. 14 W. Also, the N½ SE¼, and two small fractions in the NW¼SE¼SW¼, sec. 6, T. 41 S., R. 13 W. All in Washington County, Utah. Applicant is the owner in part, and contract purchaser in part, of the land.

Date of application: August 31, 1955

Amount of application: $102,780.50

Work Proposed: 25,000 feet of rotary and diamond drilling in 53 holes to explore the down-dip extension of the Silver Reef sandstone unit of the Chinle formation, the drilling to be conducted in 5 separate areas.

Estimated Cost with Applicant doing own work:

Bulldozer work	$1,600.00	
Labor, supervision and consultants	49,562.50	
Operating materials & supplies	22,780.00	
Operating equipment	10,000.00	
Miscellaneous	9,500.00	
Contingencies	9,344.00	
Total estimated cost		$102,786.50
Gov't. Participation @ 75%		77,089.88

Field Team Report: Transmitted January 27, 1956
R. W. Osterstock USGS & M. M. Gilkey, USBM

Known uranium mineralization in the area of the Applicant's property is confined to the Silver Reef sandstone unit of the Chinle formation. Ore bodies mined to date are isolated and irregular in occurrence and do not appear to be subject to projection in any direction. All known deposits have been found near the surface, in the zone of oxidation. The area has produced silver ores valued at

approximately $8,000,000. The Applicant has produced 641 tons of ore from the adjacent Chloride Chief mine which assayed 0.315% U_3O_8 and 3 ounces of silver per ton after hand sorting.

The Applicant's proposed program is based upon the theory that a zone of primary hydrothermal mineralization exists below the permanent water table and down-dip from the known uranium deposits. However, insufficient evidence is present to indicate the existence of such a primary mineralized zone. Two shafts in the district have reached depths in excess of 500 feet and 53,000 feet of drilling has been completed just south of the subject property. In addition the AEC drilled 14 holes down dip from the outcrop of the White reef, ranging in depth from 202 feet to 340 feet. None of the fore-going work appears to have penetrated a primary ore zone. Very weak uranium mineralization was encountered in three of the AEC holes. The Applicant reported that 43,000 feet of wagon drilling and 10,000 feet of rotary drilling on the adjacent property were all in the zone of oxidation and that the work "blocked out" 34,800 tons of material containing 0.10% U_3O_8 and 11.0 ounces of silver per ton.

The isolated nature of the near surface ore bodies, their areal irregularity, and low grade do not support the postulation regarding the existence of a primary ore zone at depth. It is recommended that the application be denied.

Commodity Group Comments:

USGS, Nelson, N. E., February 9, 1956:

The examiners conclude that further pursuit of proof of the existence of a primary ore zone at depth would be prospecting and not to be contenanced. Concurs with the recommendation for denial, but without prejudice.

USBM, Crawford, John E., Feburary 15, 1956:

Discussed the report of examination with the AEC representative. Concurs with the recommendation of the Field Team that the application be denied.

Rare & Miscellaneous Metals Division, Michael Ching, February 20, 1956:

The proposed project appears to be based upon a theory that is not too strongly supported by the available evidence. It is difficult to understand why the Applicant has not tested its own theory in view of the fact that the Company has drilled over 50,000 feet of holes on its adjacent property.

Conclusions and Recommendations:

The chances of finding worthwhile primary ore bodies at depth are not good. It is recommended that the application be denied.

Ernest Wm. Ellis

Ernest Wm. Ellis, Chief
Rare and Miscellaneous Metals Division

FEB 20 1956

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

RECEIVED
FEB 20 1956

February 16, 1956

224 New Customhouse
Denver 2, Colorado

Mr. Richard V. Wyman
Western Gold and Uranium, Inc.
Silver Reef Uranium Mines
Leeds, Utah

Re: Docket DMEA 3974 (Uranium), Silver Reef Mines, Washington County, Utah

Dear Mr. Wyman:

This will acknowledge receipt of your letter dated February 13, 1956 inquiring as to the present status of the subject application.

The Report of Examination on this property has been forwarded to the DMEA Washington office for their final action. You should receive advice from them within a reasonably short time.

Very truly yours,

W. M. TRAVER,

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

HMC:ab

cc: Chair. Op. Comm. (2)
Docket 3974
Chron.

(2)

FEB 20 1956

WESTERN GOLD & URANIUM, INC.

SILVER REEF URANIUM MINES

LEEDS, UTAH

42 BROADWAY
NEW YORK 4, N. Y.

FIRST NATIONAL BANK BUILDING
CARSON CITY, NEVADA

February 13, 1956

DMEA
Date Rec'd.
FEB 15 1956
BUREAU OF MINES
Denver, Colorado

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Regin III
224 New Customhouse Bldg.
Denver, 2, Colo.

Dear Mr. Traver:

Re: DMEA - 3974

We have not heard from your agency recently regarding the above application, which was for deep drilling for primary uranium ore.

You would be interested to know that we have drilled a few holds in the vicinity of hole #1 in area #1 of this application and found primary uranium mineralization, in one case three feet of .09% U_3O_8 (wet assay). In our opinion, the entire DMEA program becomes more urgent to us. When may we hear of the outcome of our application?

Yours truly,

WESTERN GOLD & URANIUM, INC.

R. V. Wyman

Richard V. Wyman

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

RECEIVED
FEB 20 1956

February 16, 1956

2124 New Customhouse
Denver 2, Colorado

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Executive Officer, DMEA
Field Team, Region III

HMC:ab

cc: Chair. Op. Comm. (2)
Docket 3974
Chron.

(2)

FEB 20 1956

WESTERN GOLD & URANIUM, INC.

SILVER REEF URANIUM MINES

LEEDS, UTAH

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CARSON CITY, NEVADA

2 BROADWAY
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R. V. Wyman

Richard V. Wyman

2-15-56 [illegible]

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

RECEIVED
FEB 15 1956

February 15, 1956

Memorandum

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

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

Subject: Report of Examination, DMEA Docket 3974, Western Gold and Uranium, Inc., Silver Reef Mines, Washington County, Utah

I have reviewed the Report of Examination, DMEA Docket 3974, Western Gold and Uranium, Inc., Silver Reef Mines, Washington County, Utah, dated January 27, 1956, and received in this office February 6. I have also discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

Western Gold and Uranium, Inc., applied for a loan of $102,786.50 to explore for uranium on company-owned property. Exploration was to consist of diamond drilling and rotary drilling some 51 holes, totaling 25,000 feet.

The Field Examiners, upon investigation of the subject property, have determined that insufficient evidence is present to indicate that significant deposits of uranium may exist at depth. Uranium mineralization near the surface in the oxidized zone is irregular and deposits are isolated.

We concur with the recommendation of the Field Team that the application be denied, inasmuch as it is extremely doubtful that exploration would result in the discovery of minable uranium deposits.

John E Crawford
John E. Crawford

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

RECEIVED
FEB 15 1956

February 15, 1956

Memorandum

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

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

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John K. Crawford

2/13/56

IN REPLY REFER TO:

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

RECEIVED
FEB 10 1956

February 9, 1956

Re: DMEA Docket 3974
Western Gold and Uranium, Inc.
Silver Reef mines
Washington County, Utah
$102,786.50 - Uranium - silver

Memorandum

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

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

Subject: Review of Field Team report.

The applicant requested Government participation in a 25,000 foot drilling project designed to test below the permanent water table, a sandstone reef in which, near surface, are oxidized uranium-silver ore bodies.

The applicant bases the application on the theory that the near surface oxidized ore, silver and uranium, will at a horizon near and below the permanent water table give way to primary ore. Drilling by the applicant has indicated, according to the applicants, 8 centers of uranium mineralization, 6 of which are in the vicinity of the worked out Chloride Chief silver mine. One body, 100 x 200 feet, is adjacent to the shaft areas of that mine. Whether or not the mine is open we are not informed. Two larger ore bodies are shown to the south of west of the shaft. As shown, 5 ore bodies are small. The applicant's estimate blocked out reserves at 34,800 tons containing 0.10% U_3O_8, 11 ozs. silver, 0.50% copper and 0.60% V_2O_5. per ton.

Shaded blocks, representing drilled areas, show the drilling that was done laterally and up and down dip from the ore bodies, but hole spacing is not indicated. Apparently the reef is oxidized wherever cut. The 14 holes drilled by the AEC in the White Reef section to the west also cut the reef in the oxidized zone. I assume that except for the holes that indicated the ore bodies the results were most unfavorable since no detailed information concerning the reef, that might bear on the validity of the theories, is given. Mr. Wyman, the applicant's geologist, seems to have concluded that the evidence supported his theory and the application, the examiners conclude further pursuit of proof of the theory, possibly sound, would be prospecting and in this case, not to be countenanced.

I concur with the recommendation of the examiners and the Field Team that the application be denied, but without prejudice.

N. E. Nelson

N. E. Nelson

IN REPLY REFER TO:

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

RECEIVED
FEB 10 1956

February 9, 1956

Re: DMEA Docket 3974
Western Gold and Uranium, Inc.
Silver Reef mines
Washington County, Utah
$102,786.50 - Uranium - silver

Memorandum

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I concur with the recommendation of the examiners and the Field Team that the application be denied, but without prejudice.

N. E. Nelson

N. E. Nelson

NENelson:cm

cc: DRF, 4212
Br reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641
J. O. Hosted, 3210

2/7/56 gla

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

RECEIVED
FEB - 3 1956

January 27, 1956

224 New Customhouse
Denver 2, Colorado

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Report of Examination, Docket DMEA 3974 (Uranium), Western Gold and Uranium Inc., Silver Reef Mines, Washington County, Utah

Enclosed are the original and three copies of an Engineering and Geologic Report of Examination on the subject property.

In view of the weakness of the uranium mineralization above the water table, and doubt as to the existence of a primary zone below the permanent water table, the field examiners recommend that the application be denied. We concur in this recommendation.

DMEA Field Team, Region III

W. M. Traver

W. M. Traver

E. N. Harshman

E. N. Harshman

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
2-6-56
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
1600 EAST FIRST SOUTH STREET
SALT LAKE CITY 12, UTAH

TRANSMITTED

JAN 27 1956

DMEA
Date Rec'd RECEIVED
JAN 27 1956

BUREAU OF MINES
Denver, Colorado

January 25, 1956

Memorandum

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

From: Stephen R. Wilson

Subject: Docket No. DMEA-3874 (Uranium), Western Gold and Uranium, Inc., Silver Reef mines, Washington County, Utah

Enclosed are the original and 10 copies of an engineering report covering examination of the subject property for appraisal of a request for DMEA assistance. The property was examined by M. M. Gilkey with R. W. Osterstock of the Survey during October 1955. Also included with the report are copies of a separate section, Summary, Conclusions and Recommendations, and a copy of the brochure.

Representatives of the Western Gold and Uranium, Inc., have requested a loan of $102,786.50 to explore company-owned property by 25,000 feet of rotary and diamond drilling. Company geologists have postulated a zone of primary hydrothermal mineralization below the permanent water table and down-dip from the known uranium deposits. The proposed exploratory project is based on this theory. Known uranium mineralization in the Silver Reef area is confined to a sandstone unit of the Chinle formation. Uranium ore bodies mined to date are isolated and irregular in occurrence and do not appear to be subject to projection in any direction. All disclosed deposits have been found near the surface in the zone of oxidation.

The examining engineer and geologist recommend denial of the request for DMEA assistance. They believe that insufficient evidence is present to indicate existence of a primary mineralized zone below the present zone of oxidation. Also, known uranium mineralization above the permanent water table is weak and erratically distributed. I am in accord with the recommendations of the examining personnel.

The application and property of Western Gold and Uranium, Inc., have been discussed with members of the Salt Lake City office of the Atomic Energy Commission.

Stephen R. Wilson
Stephen R. Wilson

Reviewed by
DMEA OPERATING COMMITTEE
2-6-56
(date)

Enclosures

cc: J. B. Clemmer

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DMEA
Date Rec'd.
JAN 27 1956
BUREAU OF MINES
Denver, Colorado

TRANSMITTED
JAN 27 1956

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By R. W. Osterstock and M. M. Gilkey

Western Gold and Uranium, Inc., has applied for Government assistance in exploration on uranium property in the Silver Reef area, Washington County, Utah. The application, under docket No. DMEA 3974, requests a loan of $102,786.50 for diamond drilling and rotary drilling totaling 25,000 feet in 51 holes. An examination of the proposed project area was made by DMEA personnel during October 1955.

Known uranium mineralization in the area of the applicant's property is confined to the Silver Reef sandstone unit of the Chinle formation. Ore bodies mined to date are isolated and irregular in occurrence and do not appear to be subject to projection in any direction. All disclosed deposits have been found near the surface, in the zone of oxidation. Representatives of the applicant company have postulated a zone of primary hydrothermal mineralization below the permanent water table and down-dip from the known uranium deposits. The proposed exploratory project is based on this theory.

The Silver Reef area has produced silver ores valued at approximately $8,000,000. During recent years limited activity in the district has consisted principally of exploration. The applicant company has mined approximately 650 tons of ores that were sold for the uranium content. A total of 641 tons, after hand sorting, assayed 0.315 percent U_3O_8 and 3 ounces of silver per ton.

Reviewed by
DMEA OPERATING COMMITTEE
2-6-56
(Date)

The examining engineer and geologist recommend denial of the request for DMEA assistance submitted by Western Gold and Uranium, Inc. It is believed insufficient evidence is present to indicate the existence of a primary mineralized zone below the present zone of oxidation. In addition, uranium mineralization above the water table is weak and erratically distributed.

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WESTERN GOLD AND URANIUM, INC.
SILVER REEF MINES
WASHINGTON COUNTY, UTAH
DMEA-3974
Uranium

TRANSMITTED
JAN 27 1956

Engineering Report

By M. M. Gilkey
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
2-6-56
(date)

WESTERN GOLD AND URANIUM, INC.
SILVER REEF MINES
WASHINGTON COUNTY, UTAH

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Topography and climate	5
Ownership and extent	5
History and production	6
Description of the deposits	7
Ore reserves	9
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ILLUSTRATIONS

Fig. 1 Location map, Western Gold and Uranium, Inc., Washington County, Utah

Fig. 2 Claim map, showing proposed drill holes

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FEB - 3 1956

SUMMARY

Western Gold and Uranium, Inc. has applied for Government aid in an exploratory drilling project, estimated to cost $102,786.50, on silver-uranium property in the Silver Reef area, Washington County, Utah. Geological Survey and Bureau of Mines personnel examined the property October 11, 1955.

The property is situated in an easily accessible area near Leeds, Utah, on U. S. Highway 91.

A large portion of the $8,000,000 in silver production recorded for the Silver Reef district came from chloride ores from the applicant's claims prior to 1909. The ore bodies are irregular, blanketlike replacement deposits, generally 2 to 5 feet in thickness. Weak uranium mineralization and small amounts of copper commonly occur with the silver. Approximately 650 tons of ore from the area has been sold for the uranium content. After sorting, 641 tons of this assayed 0.315 percent U_3O_8 and 3 ounces silver per ton. Recent activity in the district has been limited to exploratory drilling and shaft sinking.

The principal structural feature of the district is the northeasterly trending Virgin anticline. The applicant's claims lie in the area of the plunging, northeast end of that structure, where erosion has exposed the Moenkopi shale, Shinarump conglomerate, Chinle formation and Navajo sandstone. Near the middle of the Chinle formation is the ore-bearing Silver Reef sandstone.

The resistant Silver Reef sandstone, repeated by faulting, outcrops in three mineralized reefs. Rocks in the proposed project area strike northerly to easterly and dip westerly to northerly. A common dip is about 30 degrees.

Two shafts in the district have been extended to vertical depths in excess of 500 feet. More than 50,000 feet of drilling has been completed just south of the proposed project area. The applicant states that ore "blocked out" by the drilling totals 34,800 tons, containing 0.10 percent U_3O_8, 0.50 percent copper, 0.60 percent V_2O_5, and 11.0 ounces silver per ton. None of the mine workings or drill holes have penetrated a primary ore zone.

The applicant proposes to drill 51 rotary- and diamond-drill holes totaling 25,000 feet, down dip from mineralized outcrops, to intersect the ore horizon in a primary zone assumed to exist below the permanent water table. The estimated unit cost of $4.11 a foot is not unreasonable, and good core recovery could be expected in the ore zone.

Lack of evidence, however, of the existence of a primary ore zone below the permanent water table, and the weakness and erratic distribution of uranium mineralization in the zone above the water table, leads to the conclusion that the proposed drilling is not warranted. Therefore, it is recommended that the applicant's request be denied.

INTRODUCTION

Western Gold and Uranium, Inc. submitted an application dated August 31, 1955, for Government aid in an exploratory drilling project on silver-uranium property in Washington County, Utah. The estimated cost of the project is $102,786.50. The property was examined October 11, 1955, by R. W. Osterstock of the Geological Survey and M. M. Gilkey of the Bureau of Mines. R. V. Wyman, geologist and superintendent, represented the applicant.

The examiners recommend that the loan request be denied.

LOCATION

Property of the Western Gold and Uranium, Inc., generally known as the Silver Reef mines, is situated in the Silver Reef (Harrisburg) mining district in Washington County, Utah, near the small settlement of Leeds, Utah (Fig. 1). Most of the ground is within 1½ miles to the north and to the west of the town. Leeds is on U. S. Highway 91, about 18 miles north of St. George, Utah (population 4,545), the largest town in the area and source of supplies. The AEC ore receiving depot at Marysvale, Utah, is approximately 130 miles to the northeast.

The applicant's property lies principally in Sec. 1, T. 41 S., R. 14 W., and Sec. 6, T. 41 S., R. 13 W., S.L.B. and M. (Fig. 2). The property extends south into Secs. 11 and 12, T. 41 S., R. 14 W., and Sec. 7, T. 41 S., R. 13 W.; also north into Sec. 36, T. 40 S., R. 14 W., and Sec. 31, T. 40 S., R. 13 W. Fractions of several claims lie in Sec. 2, T. 41 S., R. 14 W. Only part of this ground is included in the area proposed for subordination to the Government.

TOPOGRAPHY AND CLIMATE

The Silver Reef mines are situated near the plunging, northeast end of the Virgin anticline, in an area where this structure has been breached, and the surface reduced by erosion to a series of shallow, horseshoe-shaped valleys and low hogback ridges. The average altitude is approximately 4,000 feet. A cliff of red Navajo sandstone rises about 100 feet above the mine area on the west flank of the anticline.

The region is semiarid, with long, hot summers and mild winters. Water for drilling purposes is available from Leeds Creek, a small stream which flows eastward across the company property.

OWNERSHIP AND EXTENT

Two title categories are represented by the company's holdings; part of the land is owned by the applicant and part is held under purchase agreements. A line shown on figure 2 separates the "owned" from the "controlled" land. Photocopies of three purchase agreements are attached to the application.

The boundaries of the area to be subordinated, as described in the application (Item 3 (a)), are also shown on the map.

Unpatented claims included in the proposed project area are listed below. These are recorded at St. George, Utah, county seat of Washington County.

In Sec. 6, T. 41 S., R. 13 W.:

	Book	Page
Harris No. 3	X24	388
" " 4	"	388
" " 5	"	389
" " 6	"	389
" " 7	"	389
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In Sec. 1, T. 41 S., R. 14 W.:

Harris No. 1	X24	387
" " 2	"	388
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Ralph No. 1	"	395
" " 2	"	395
" " 3	"	395
" " 4	"	395
" " 5	"	396
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" " 7	"	397
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" " 2	"	463
" " 3	"	464

HISTORY AND PRODUCTION

High-grade silver ore was discovered in the Silver Reef district in 1869. The recorded value of silver production, through 1909, is approximately $8,000,000. A large portion of this came from ground presently held by the applicant, in the vicinity of the proposed drilling areas. The limited activity in the district since 1909 has been principally of an exploratory nature—drilling and shaft sinking.

The presence of uranium mineralization in the silver ores in the Silver Reef district was discovered during the early productive period. The company geologist states that recorded production of ores sold for the uranium content includes 641 tons shipped by the applicant to the Marysvale, Utah receiving depot during 1952, 1953 and 1954. The ores were mined from the Chloride Chief property, which lies a short distance south of the proposed project area. The ore shipped is reported to have averaged, after some hand sorting, 0.315 percent U_3O_8 and 3 ounces per ton in silver. Additional reported production of uranium ores totals about 8 tons.

DESCRIPTION OF THE DEPOSITS

The ore deposits of the Silver Reef district occur in the Silver Reef sandstone which consists of the Tecumseh and Leeds members of the Chinle formation of upper Triassic age. The Chinle is one of the four sedimentary formations exposed by erosion of the northeasterly trending Virgin anticline, in the area of the applicant's property. In ascending order, the exposed formations are as follows:

1. In the interior, the lower Triassic Moenkopi shale
2. The upper Triassic Shinarump conglomerate
3. The upper Triassic Chinle formation (with the Silver Reef sandstone near the middle)
4. At the top, the red, Jurassic Navajo sandstone.

Total thickness, from the bottom of the Moenkopi through the Navajo, is approximately 3,200 feet.

The mineralized Silver Reef sandstone is light grey, medium grained and massive. On the west side of the anticline, this resistant bed is repeated once by a thrust fault, and again by a normal fault. Originally, the three reefs, the White, the Buckeye, and the Butte, were believed to constitute three distince mineralized beds (Fig. 2). The rocks in the proposed project area strike northerly to easterly, and dip westerly to northerly, commonly at about 30 degrees.

Many prospect holes and inclined shafts have been sunk on mineralized exposures in the prominent reef outcrops. A number of vertical shafts have been sunk to intersect the mineralized bed at depth. Some of the workings have been extended to depths greater than 500 feet, vertical distance. To date, none of the workings or exploratory drill holes have penetrated a primary ore zone postulated by the applicant.

Ore bodies mined for their silver content are irregular, blanket-like replacement deposits which generally range from 2 to 5 feet in thickness. The greater part of the silver produced has been from chloride ores, within 500 feet of the outcrop and within 150 feet vertical distance from the surface. Minor amounts of silver sulfide (and chalcopyrite) are found erratically distributed throughout the mine workings. Grade of the ores appears to decrease with depth.

Other minerals present include native silver, copper carbonates, and secondary minerals of uranium and vanadium. The silver, copper, and uranium minerals have no fixed quantitative relationships. Ores containing a comparatively high copper content may, or may not, include a high content of silver. Commercial uranium ore (0.315 percent U_3O_8) from the Chloride Chief mine contained only 3 ounces of silver per ton.

The silver, copper and uranium do not seem to be closely related genetically. Localization of the ore deposits appears to be influenced mainly by carbonaceous material. Mr. Wyman, company geologist, attaches considerable importance to fracturing as an ore control, and calls attention to bleaching of the sandstone in the vicinity of ore deposits. Fourteen exploratory holes have been drilled down dip from the outcrop of the White reef, by the AEC. The holes range in depth from 202 feet to 340 feet, all penetrating the oxidized ore zone. Copper stain and carbon trash are common. Very weak uranium mineralization was encountered in three of the holes. The results discouraged further drilling.

ORE RESERVES

The applicant states that, on the adjacent land to the south of the proposed project area, 43,000 feet of wagon drilling and 10,000 feet of rotary drilling have been completed in the zone above the

permanent water table. Ore "blocked out" by this drilling at company expense is reported to be 34,800 tons containing 0.10 percent U_3O_8, 0.50 percent copper, 0.60 percent V_2O_5, and 11.0 ounces silver per ton.

There are no known ore reserves on the ground to be subordinated.

PROPOSED EXPLORATION

The applicant proposes a project consisting of 51 holes and totaling 25,000 feet of rotary and diamond drilling. The proposed holes are located in five areas as shown on figure 2. Spacing of the holes, as plotted, ranges from 200 to 400 feet. It is reported that the two holes proposed for Area No. 4 are to be drilled by the company, in which event the equivalent footage would be used elsewhere on the project. Time to complete the program is estimated at 18 months from the date of a project contract. Actual working time, using one drilling rig, 6 days a week, on a three-shift basis, is 1,248 shifts, or 16 months.

Total estimated cost of the project is $102,786.50. Government participation is 75 percent of this amount, or $77,089.88. On the basis of 25,000 feet of drilling, the unit cost (average cost for rotary plus diamond drilling) is $4.11 a foot. The 51 holes indicated on figure 2 range from 300 to 700 feet and average 490 feet in depth. The total footage is not broken down into rotary and diamond drilling; it is assumed that a large portion of the drilling above the ore-bearing sandstone will be rotary drilling.

Road and drill-site construction are to be subcontracted. The applicant has assumed an average advance of 20 feet per shift and 16 operating months of expenditures for labor, supplies, equipment, and other cost categories, in reaching an average cost for 25,000 feet of drilling. The cost of road and drill-site construction is included in the average drilling cost. Although $4.11 a foot is not unreasonably high, it appears to be somewhat higher than might be expected under the prevailing conditions. It seems probable that the average advance would exceed 20 feet per shift.

Adequate operating equipment, including a rotary- and diamond-drilling rig, would be furnished by the operator. The equipment is now being used on the property, in a company drilling program.

The applicant proposes to drill the holes to intersect below the permanent water table, the down dip projection of mineralized outcrops. Some difficulty is experienced in rotary drilling through the boulder alluvium zone, but the ore-bearing sandstone is expected to yield good core recovery.

CONCLUSIONS AND RECOMMENDATIONS

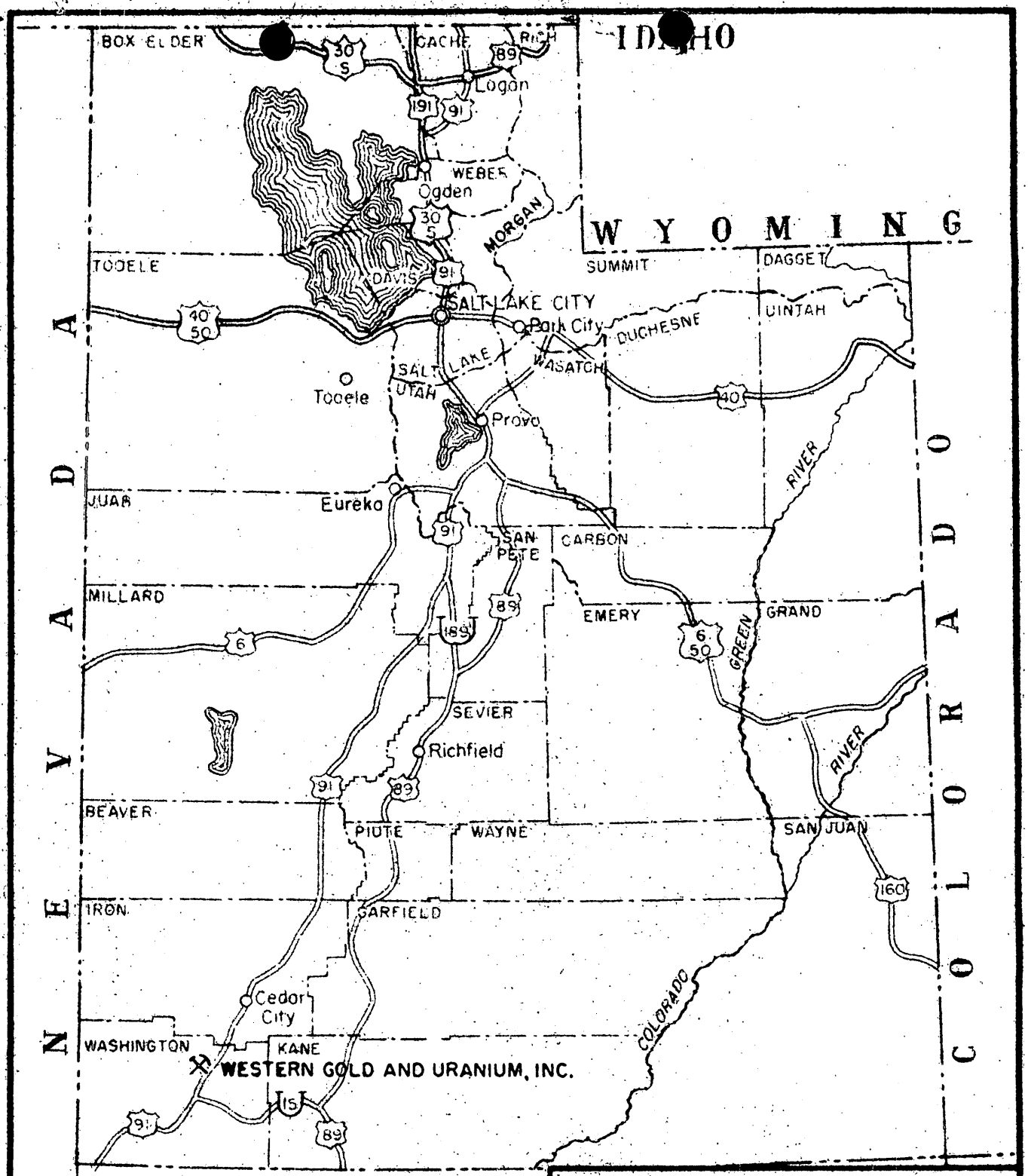
The applicant assumes the existence of a primary ore zone of hydrothermal origin containing pitchblende or urananite, argentite and chalcopyrite below the permanent water table. The host rock is a relatively thin stratum of sandstone, upturned by anticlinal folding.

The assumption of hydrothermal origin of the ores seems to be of questionable validity because of the lack of alteration of the enclosing rocks, and the absence of gangue minerals, or alteration products thereof, in the zone already explored above the permanent water table. The existence of a primary zone is not indicated by the distribution of sulfide mineralization in the mine workings; there is no apparent increase in the proportion of sulfides in the deeper workings.

Uranium mineralization, where encountered above the water table, is generally weak and erratically distributed.

In view of the weakness of the uranium mineralization above the water table, and doubt as to the existence of a primary zone below the permanent water table, it is recommended that the applicant's request for Government aid be denied.

The proposed project has been discussed with personnel of the Salt Lake City office of the Atomic Energy Commission.



U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Fig. 1 DMEA Docket No. 3974

Location Map

WESTERN GOLD AND URANIUM, INC.

LEEDS, WASHINGTON CO., UTAH

ENGINEER *Millard M. GILKEY* DATE: JAN., 10, 1956

TRACED: JAN., 1956; A.P.T.S.

CHECKED:

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MINERAL DEPOSITS
DMEA
RECEIVED
DEC 13 1955
U. S.
GEOLOGICAL SURVEY
DENVER, COLORADO

TRANSMITTED

JAN 27 1956

Room 208, 222 So. West Temple
Salt Lake City 1, Utah
December 9, 1955

DEC 19 1955
BUREAU OF MINES
Denver, Colorado

Memorandum

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

From: R. W. Osterstock

Subject: DMEA Docket 3974 (Uranium) Western Gold and Uranium, Inc., Silver Reef Mines, Washington County, Utah.

Enclosed are eleven copies of an initial geologic report of examination on the subject docket by R. W. Osterstock (USGS).

Western Gold and Uranium, Inc. applied for government assistance to search for uranium on their property in the Silver Reef district, Washington County, Utah. The property was examined by DMEA personnel and the report has been discussed with representatives of the Atomic Energy Commission.

Known uranium mineralization on the property is confined to a white sandstone unit in the Triassic Chinle formation. The ore bodies are isolated and irregular and do not appear to be subject to projection in any direction. All of the presently known ore deposits are in the oxidized zone near the outcrop. The applicants postulate the existence of a primary ore zone beneath the permanent water table down dip from the known deposits. Too little evidence exists to support this theory. Consequently, the program as proposed by the applicants is untenable. It is recommended that the application be denied.

R. W. Osterstock

R. W. Osterstock

Reviewed by
DMEA OPERATING COMMITTEE
2-6-56
(date)

WESTERN GOLD AND URANIUM, INC.

SILVER REEF MINES, WASHINGTON CO., UTAH

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TRANSMITTED
JAN 27 1956

DMEA DOCKET 3974

Initial Geologic Report

By R. W. Osterstock
U. S. Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE
2-6-56
(date)

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ILLUSTRATIONS

Figure 1. Index map of Utah.

Figure 2. Geologic map of the Silver Reef district.

RECEIVED
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SUMMARY

Western Gold and Uranium, Inc., applied for government aid in their search for uranium-silver ores on their property in the Silver Reef district, Washington County, Utah. The property was examined by DMEA personnel on October 11, 1955.

The Western Gold property covers most of the northern end of the northeasterly plunging nose of the Virgin anticline. The property boundaries encompass the most productive but now defunct silver mines in the district.

Known ore mineralization on the property is confined to a light colored sandstone unit in the Triassic Chinle formation, generally this unit is referred to as the Leeds member of the Chinle formation. The applicants postulate that this unit is an altered facies within the Tecumseh member of the Chinle. Carbon trash and clay galls appear to have provided some degree of ore locallization in the near surface deposits, all of which lie within an oxidized zone as evidenced by the minerals present. Known ore deposits are isolated, irregular blanket-like replacements which may contain one or all of silver, uranium and copper.

Drill hole data gathered by the AEC and the applicants tend to refute the dependability of downdip projections of ore zones. The association of fractures and joints with known ore bodies is fairly well established but these are local features lacking the persistence required for projection. Thus no firm lateral control for the ore zones is at hand. Postulating a primary ore zone below the permanent water table entails a hydrothermal theory of origin of the ores. If such is the case then the enriched ore bodies in the near surface oxidized zone should either be much more prevalent or much higher grade in order to provide for more than traces of the ore minerals in the protore zone.

The many intangible factors regarding the very existence of a protore zone necessitate the conclusion that the program as set forth by the applicants is a prospecting venture.

It is recommended that the application for government assistance be denied.

INTRODUCTION

Western Gold and Uranium, Inc., applied, on August 31, 1955, for DMEA assistance on a uranium exploration program on their property in the Silver Reef district, Washington County, Utah. The estimated total cost of the program as proposed by the applicants is $102,786,50.

At the request of the Region III DMEA Field Team, a joint examination of the property was conducted on October 11, 1955 by R. W. Osterstock (USGS) and M. M. Gilkey (USBM). The examiners were accompanied in the field by R. V. Wyman, geologist and superintendent of the Western Gold and Uranium, Inc. operation in the Silver Reef district.

Location and Accessibility

The Western Gold property, collectively known as the Silver Reef mines, is situate in the Silver Reef (Harrisburg) mining district in Washington County, Utah. Specifically the company ground lies within Sec. 6, T. 41 S., R. 13 W. and Sec. 1, T. 41 S., R. 14 W., SLB and M. Geographically, the property is in an area of subdued topography consisting of rounded hills and ridges separated by shallow gullies and basins. Some of the ridges in the western part of the area attain cuesta-like silhouettes as a result of their relatively greater resistance to erosion that the surrounding materials. Few of the hills exceed 4000 feet elevation, the basin floors are generally less than 300 feet lower. Westerly from company property a high plateau-like mass of Navajo sandstone dominates the terrain.

The mine area may be reached by travelling north from St. George, Utah on paved U. S. Highway 91 for 17 miles to Leeds, Utah, thence continue northerly on U. S. 91 for 0.5 mile, thence turn left on graded dirt road for 0.3 mile to Doyle homestead which is at the northeast corner of the company property.

Most of the roads providing access to the various parts of the property are unimproved dirt which might be subject to washout during severe rainstorms.

Generally however, rainfall is slight. The summers are extremely hot and winters are mild.

History and Production

From its discovery about 1875 until 1909, when the last large scale mining operation was closed down, the entire Silver Reef district produced about 8 million dollars worth of silver ores. Since 1909 there has been only sporadic leasing activity as well as some unsuccessful larger scale silver exploration ventures. The presence of uranium in the area was recorded in some of the early district studies, however no active interest in this metal was undertaken until 1950. To December 1950 only 8.68 tons of 0.67 percent U_3O_8 had been shipped from the entire district. During 1952, 53, 54 the applicants report having shipped 641 tons of 0.315 percent U_3O_8 to the AEC purchasing depot in Marysvale, Utah. They estimate total district production to date as about 700 tons of average grade 0.31 percent U_3O_8. Western Gold and Uranium, Inc. has thus far accomplished at their own expense about 43,000 feet of wagon drilling and 10,000 feet of rotary dilling on land slightly to the south of the ground under consideration for DMEA assistance. The applicants estimate that this work has "blocked out" 34,800 tons of ore containing .10 percent U_3O_8, 11 oz. Ag/ton, .50 percent copper and .60 percent V_2O_5.

GEOLOGY

The Silver Reef District is underlain by Triassic and Jurassic sedimentary rocks. The exposed stratigraphic sections, according to P. D. Proctor (Utah Geological and Mineralogical Survey, Bull. 44, pp 16-38, 1953) is as follows:

Navajo (Jurassic)—1200'-2100' thick, massive, crossbedded, locally red in lower part but generally white.

Chinle (Triassic)—about 1100' thick, alternating sandstone and shale. This formation is subdivided as follows:

Duffin ss.—427' thick, medium to coarse grained brick red ss and purple shale.

Silver Reef ss.—

Tecumseh ss.—35'-45' thick, thin bedded and massive lavendar colored ss.

Leeds ss.—60' thick, fine grained white to buff ss. Much carbon trash. This unit is the main ore carrier in the district.

Trail Hill ss.—310' thick, brownish red to brick red shale and interbedded fine grained ss.

Fire Clay Hill bentonitic shale—10'-13' thick, fluffy soil indicative of bentonite characterizes the outcrop. Contains calcareous concretions and a thin agate bed.

Hartley sh.—280' thick, deep red shale and lesser fine grained ss. Minor gypsum.

Shinarump congl. (Triassic?)—115' thick, coarse grained ss. with abundant interbedded pebble conglomerate.

Moenkopi (Triassic)—350' thick, interbedded red and maroon ss and minor gypsum beds.

The strata of the district are exposed in horseshoe shaped valleys and ridges, the topographic expression of each unit being dependent on its relative resistance to erosion. The ore bearing Silver Reef ss. member of the Chinle formation is characteristically exposed as a ridge which is topographically prominent and thus accounts for the name of the district. The entire sequence of beds is believed by Rogers, Mayer, and Ball (Preliminary Geological Report on the properties of the Silver Reef Consolidated Mines Company, unpublished, 1920) and Stugard (Uranium Resources in the Silver Reef District, Washington County, Utah, U. S. Geological Survey, TEMR 214, p. 1, 1951) to be

the result of shallow water deposition. Fluviatile origin of some of the beds is suggested by crossbedding, intraformational conglomerates and concentrations of carbon trash. The exact origin of the Fire Clay Hill bentonitic shale member of the Chinle formation is controversial, Proctor (1953, p. 142) suggests direct volcanic origin of the shale as a part of hic theory regarding the origin of the ore deposits. R. V. Wyman, company geologist, maintains that the lighter colored Leeds sandstone is an alteration feature of the lower portion of the Tecumseh member of the Chinle. AEC geologists in the district have been unable to differentiate between the Tecumseh and the Leeds on the east side of the district. Earl King (AEC, personal communication) questions the validity of Wyman's hypothesis of alteration as a guide to ore inasmuch as most of the district exhibits light colored sandstone.

No igneous rocks are exposed in the immediate mine area, however Quaternary basalt flows occur profusely a few miles to the southeast of the property. A Quaternary deposit of boulder alluvium fills the basins of the property, this is a rather distinct lithologic unit and has been mapped as such. The boulders are believed to have their origin in the intrusive mass of andesite porphyry which forms the core of the Pine Valley Mountains several miles to the northwest of the mine area.

In the early days the Silver Reef district was thought to have three separate ore bearing horizons which were termed the Butte Reef, the Buckeye Reef and the White Reef. More recent studies have demonstrated that only one "reef" exists but this has been repeated by thrusting and normal faulting.

The Silver Reef district lies near the northeasterly plunging nose of the Virgin anticline, this remarkably persistent anticlinal structure may be traced more than 18 miles southwesterly toward St. George, Utah. The structure reaches

a high point known as the Harrisburg dome just before it plunges northeasterly under alluvial cover and disappears. Lesser parallel folds are superimposed on the main anticline. The entire sequence of upwarped beds has been breached by erosion thus exposing the ore bearing bed as a horseshoe shaped hogback on the flanks and the nose of the plunging anticlinal structure. A few miles to the east of the district the Hurricane fault zone forms a long north-south escarpment.

The Western Gold property is located at the northwesternmost edge of the nose of the Virgin anticline in a region where overthrusts from the West have repeated the ore bearing section. The rocks in the area strike northeasterly to easterly and have moderate northwesterly to northerly dips.

Some faulting in the area has been noted by Proctor (see Fig. 2) and one of the normal faults (down on the east) serves to again repeat the section.

ORE DEPOSITS

All of the economic silver and uranium operations conducted in the district have been confined to the Silver Reef member (Tecumseh and Leeds) of the Triassic Chinle formation. By far the greatest production has come from the area on and near the northeasterly plunging nose of the Virgin anticline. Some of the operations have been conducted on the downdip extensions of mineralized outcrops. A few of the workings have reached a vertical depth of 500 feet or more.

The silver bearing ore bodies have been irregular blanket-like replacements in crossbedded lenses of light colored sandstone. The main silver bearing mineral in the ore bodies is cerargyrite and it appears to have been locallized by the presence of carbon trash and clay galls. R. V. Wyman reports that some fracture zones, generally less than 1000 feet long appear to have afforded additional locallizing control on some of mined out ore bodies. Wyman further emphasizes the importance of alteration as a locallizing factor. He states that commercially

valuable silver and uranium deposits have been restricted to that portion of the Silver Reef member of the Chinle formation which has been bleached. That such bleaching is an alteration feature and not an original sedimentary facies, Wyman attempts to demonstrate by the progressive alteration of purple clay to gray-green clay, purple mica to green mica and pink sandstone to orange and buff sandstone. Wyman believes the amount of alteration of the sandstone is a determining factor as to the presence or absence of ore bodies.

All of the uranium ore discovered to date has been associated with carbon trash and clay galls in the buff sandstone. Widespread limonite staining frequently in close proximity to the ore bodies, may in some instances be pseudomorphous after pyrite. Wyman suggests that this relationship may indicate original mineralization to have been more widespread than might be inferred by present known ore bodies. The ore bearing minerals are: Cerargyrite, pseudo-autonite, volberthite, and malachite. Some selinium in the ore suggests an unidentified silver selnide. Meta-tyuyamunite has recently been identified by AEC geologists. Manganese and iron staining are frequently associated with the ore.

Ore controls in the oxidized zone are extremely subtle, it has been noted that in some instances jointing and shattering are better developed in or near ore zones. Certainly the ore preference for carbon trash zones may not be denied. Stugard (1951, p. 28) notes that there appears to be no locallization by the anticlinal structure. The fact that the bulk of the district production has come from a fairly restricted area near the nose of the anticline would seem to refute Stugard's belief. It might also be pointed out that although uranium and silver ore bodies may be separate, they are both emplaced in the same structural and lithologic positions and are probably genetically related.

The ultimate origin of the silver-uranium-copper mineralization in the district is not clear. Rogers, Mayer and Ball (1920, p. 37) postulate normal hydrothermal emplacement, Wyman is of this opinion also. Proctor (1953, p. 142) suggests that the original minerals did not have hypogene origin and that the metals were primary constituents of original volcanic tuffs in the Chinle formation. Solution and mechanical transportation of the metals by streams eroding the tuffaceous sediments resulted in their redeposition in sandstone and shale. Further concentration was effected by solution in circulating ground water with precipitation on contact with entombed plant debris and associated bacteria. None of the theories of origin advanced to date have been completely satisfactory.

The applicants have attempted to reconstruct the "primary ore" zone from the evidence provided in the oxide ore zone. They believe that original uranium was present in the sandstone as pitchblende and was very widespread. During oxidation following the erosion of the Virgin anticline there was partial leaching of the uranium followed by precipitation in carbon trash zones. The applicants postulate the existence of three vertically separate zones of uranium mineralization:

1. Zone of oxidation above water table. Presence of silver, copper and uranium controlled by presence of suitable carbonaceous material.

2. Zone of seasonal fluctuations of water table. May be expected to contain only low grade secondary mineralization.

3. Zone of unoxidized ores. Reducing conditions constantly maintained with primary ore minerals pitchblende, montrosite, argenitite, chalcopyrite. It is this zone toward which the proposed exploration program is aimed.

Wyman believes there is a definite relation between primary Ag and U deposits but in the oxide zone the uranium tended to migrate to carbon trash bearing beds more than did the silver. Thus, he suggests initial exploration should take place down dip from the best silver shows rather than the best uranium shows. Earl

King (AEC) objects to the reference to the Leeds member of the Chinle as an alteration feature affording ore control since almost the entire reef area is light colored. King reasons that if the bleaching effect so notable in the Leeds sandstone is an alteration feature related to the ore then Ag-U mineralization should be much more widespread than present information would indicate and if not widespread because of concentrating processes of migration in the oxide zone these pockets of ore should be extremely high grade in order to postulate even a minimum mining grade in the protore zone. The applicants are expecting to encounter the following grade in the protore zone:

.20 percent U_3O_8 00 oz. Ag
or trade .01 percent U_3O_8 per oz. Ag.

Only a small amount of ore of this grade has been found to date in the enriched oxidized zone.

The Atomic Energy Commission has completed a drilling project down dip from the outcrop of the White Reef (See fig. 2). Most of the holes were more than 200 feet deep and all penetrated the ore zone. Minor copper stain and carbon trash were common in the ore zone, however uranium mineralization of extremely low grade was encountered in only three of the fourteen holes. D. E. Davis (AEC) reports that no ore trends were established as a result of the drilling and prospects of further down dip exploration appear discouraging.

The completed holes relating to the area under consideration are as follows:

I. BARBEE - WALKER MINE AREA

Hole No.	Depth	Mineral
No. 9	276.2'	TR. $CuCO_3$
No. 10	340.0'	"
No. 11	305.0'	"

II. DOWN DIP FROM WHITE REEF

Hole No.	Depth	Mineral
No. 17	223.0'	-
No. 18	215.0'	TR. $CuCO_3$
No. 19	202.0'	.05 MR/HR
No. 20	202.0'	TR. $CuCO_3$
		.10 MR/HR - 1'
No. 21	223.5'	TR. $CuCO_3$
No. 22	255.0'	"
No. 23	263.0'	Carbon Trash
No. 24	269.5'	Carbon Trash
		TR. $CuCO_3$
No. 25	282.0'	Carbon Trash
		TR. $CuCO_3$
No. 26	244.0'	Carbon Trash
		TR. $CuCO_3$
No. 29	270.0'	Carbon Trash
		TR. $CuCO_3$
		150 cps - 4'

PROPOSED EXPLORATION

The exploration program as proposed by the applicants involves drilling 45 holes in four different areas. Total drilling footage is estimated at 25,000 feet for a total cost of $102,786.50. The drill hole spacing in each area is about 250 feet. The depth of the holes is estimated on the expected position of the permanent water table in each area (see Fig. 2). It has been suggested that the present water table may be somewhat higher than the permanent water table inasmuch as irrigation of nearby farmland may have some effect.

The rather ambitious deep hole drilling into a postulated protore zone which may contain only below ore grade mineralization has, nonetheless, apparently been carefully studied by the applicants. The major consideration would appear to be the possible existence of such a body of protore. This in turn would seem to depend on the origin and mode of emplacement of the ore both in its original position and its present location in the oxidized zone. With a postulated hydrothermal origin and deposition in the Tecumseh ss and subsequent concentration by solution

and redeposition in the oxidized zone one must question the validity of the Tecumseh as the original stratigraphic depositional site. Postulating origin of the ores as original constituents in volcanics again leaves the location of the primary ores in doubt. Thus in summarizing the situation, there is considerable doubt as to the existence of a protore zone as well as to the stratigraphic location of such a zone if it does exist. In terms of lateral confinement, too little is known of the ore habit to project local features such as fractures and joints below the limits of the oxidized zone. A final feature which may not be logically disregarded concerns the expected grade of ore in a protore zone if all of the aforementioned factors were favorable; enriched ore bodies present in the oxidized zone should be much more abundant or higher grade in order to provide for more than a very small amount of primary ore in the unoxidized zone.

CONCLUSIONS AND RECOMMENDATIONS

The diamond drilling exploration program as proposed by the applicants is designed to test, below the permanent water table, the down dip projections of mineralized areas on the outcrop. The applicants believe that a protore zone will contain uranium as pitchblende, copper as chalcopyrite and silver as argentite. The expected or desired grade of ore to be encountered in the primary zone is twenty units of combined silver and uranium with a unit equal to either 0.01 percent U_3O_8 or 1 oz. of silver.

Present drilling operations by the applicant and a completed drilling program by the AEC have been essentially confined to the oxidized zone. To date the company reports having "blocked out" 34,800 tons of ore containing 0.10 percent U_3O_8 11.0 oz. Ag., .50 percent Cu, and .60 percent V_2O_5. One mine, The Chloride Chief, has produced 641 tons of ore carrying 0.315 percent U_3O_8. Inspection of these workings reveals that considerable sorting must have been done to maintain this grade.

The applicants postulate hydrothermal origin of the silver-uranium deposits in the district and use the bleached appearance of the ore carrying bed to support this hypothesis. In presuming that the bleaching effects are due to alteration and that the alteration is genetically related to the ore deposits; it then follows that a primary ore zone may exist below the oxidized zone. Unfortunately, evidence to support this theory is almost entirely lacking. The relatively lighter color of the ore bearing bed is characteristic of the bed (Leeds ss. member of the Chinle) over an extremely large area but the existence of ore bodies in the bed is restricted to the nose of the northeasterly plunging Virgin anticline. Further, if hydrothermal solutions are responsible for ore deposition there is no assurance that these solutions would have continued to utilize one particular bed at depth as an access channel way even though the near surface susceptibility of the light colored sandstone cannot be denied.

The applicant's proposals are also based on the down dip projection of mineralized zones in the outcrop. Such projection would appear to be fruitless in view of the data already compiled by the company and by the AEC which reveal the isolated nature of ore bodies as well as their areal irregularity.

Possibly the most discouraging factor is Earl King's (AEC) comment that if all of the postulations regarding the existence of a protore zone at depth were true, then silver-uranium mineralization in the oxidized zone should either be much more widespread or much higher grade than it is known to be in order to afford even a trace of uranium and silver in the protore zone.

It is therefore, concluded that a diamond drilling program for uranium ore in the zone below the water table stands little chance of success in view of scanty evidence pointing to the very existence of such a protore zone. Further, if such a zone does exist there is little likelihood that it would contain sufficient uranium to provide for an economic mining operation. Staging such a

program, as suggested by N. E. Nelson (USGS) can serve no useful purpose inasmuch as the number of holes drilled does not remove the stigma of prospecting. It is recommended that this application be denied on the grounds the program as proposed by the applicants must be considered prospecting for a zone which if it exists, is probably too low grade to be of assistance in providing for the nation's defense effort.

This application and report have been discussed with and approved by Mr. Earl King and D. L. Davis, Salt Lake Exploration Branch, AEC.

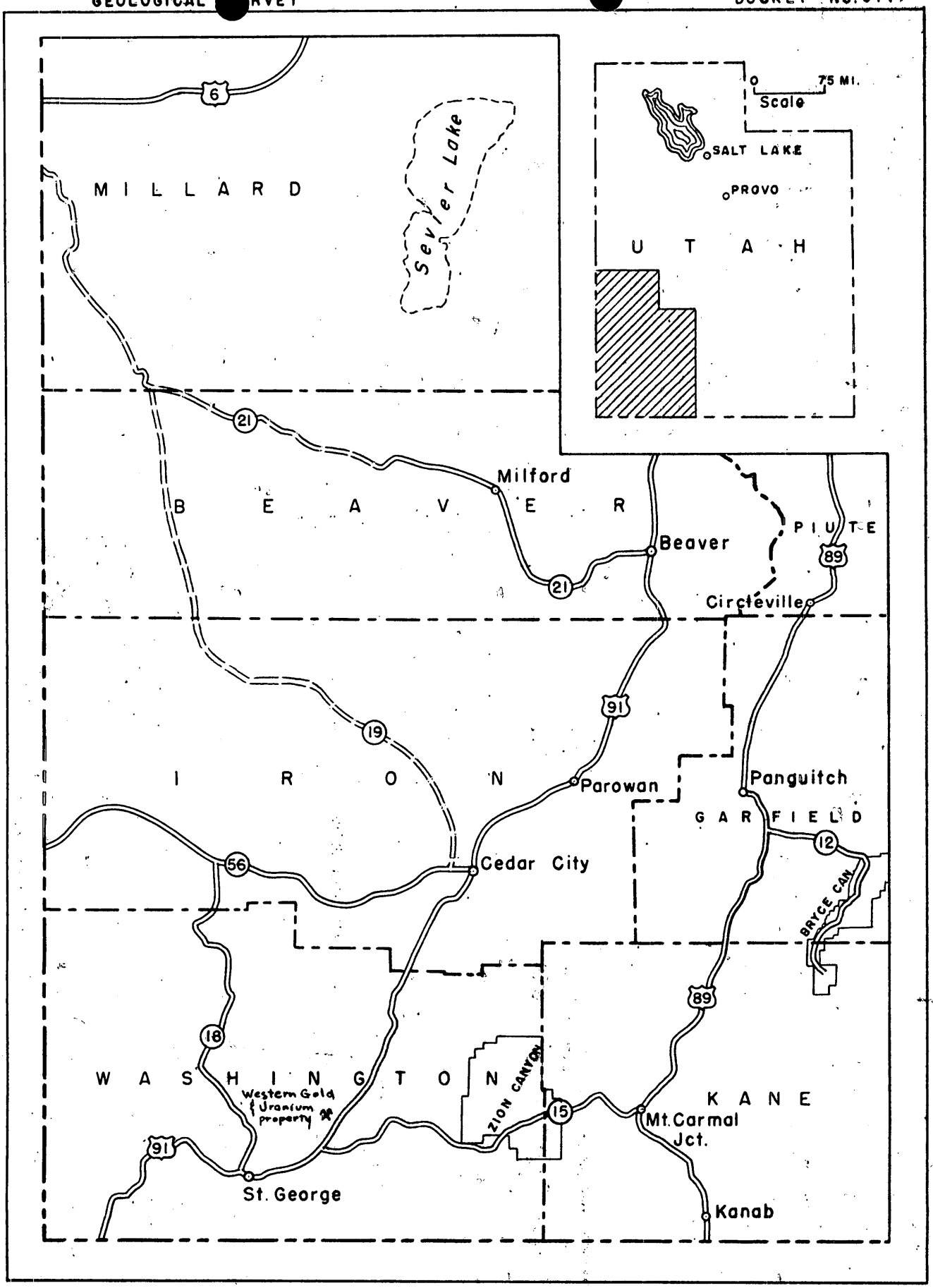

FIG. 1 INDEX MAP OF UTAH

RECEIVED
FEB - 3 1956

2-3-56

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

January 27, 1956

224 New Customhouse
Denver 2, Colorado

RECEIVED
FEB - 3 1956

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Report of Examination, Docket DMEA 3974 (Uranium), Western Gold and Uranium Inc., Silver Reef Mines, Washington County, Utah

Enclosed are the original and three copies of an Engineering and Geologic Report of Examination on the subject property.

In view of the weakness of the uranium mineralization above the water table, and doubt as to the existence of a primary zone below the permanent water table, the field examiners recommend that the application be denied. We concur in this recommendation.

DMEA Field Team, Region III

W. M. Traver

E. N. Harshman

Enclosures

Reviewed
DMEA OPER.
2-6-56
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
1600 EAST FIRST SOUTH STREET
SALT LAKE CITY 12, UTAH

TRANSMITTED

DMEA
Date Rec'd. JAN 27 1956

RECEIVED
FEB - 3 1956

JAN 27 1956
BUREAU OF MINES
Denver, Colorado

January 25, 1956

Memorandum

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

From: Stephen R. Wilson

Subject: Docket No. DMEA-3974 (Uranium), Western Gold and Uranium, Inc., Silver Reef mines, Washington County, Utah

Enclosed are the original and 10 copies of an engineering report covering examination of the subject property for appraisal of a request for DMEA assistance. The property was examined by M. M. Gilkey with R. W. Osterstock of the Survey during October 1955. Also included with the report are copies of a separate section, Summary, Conclusions and Recommendations, and a copy of the brochure.

Representatives of the Western Gold and Uranium, Inc., have requested a loan of $102,786.50 to explore company-owned property by 25,000 feet of rotary and diamond drilling. Company geologists have postulated a zone of primary hydrothermal mineralization below the permanent water table and down-dip from the known uranium deposits. The proposed exploratory project is based on this theory. Known uranium mineralization in the Silver Reef area is confined to a sandstone unit of the Chinle formation. Uranium ore bodies mined to date are isolated and irregular in occurrence and do not appear to be subject to projection in any direction. All disclosed deposits have been found near the surface in the zone of oxidation.

The examining engineer and geologist recommend denial of the request for DMEA assistance. They believe that insufficient evidence is present to indicate existence of a primary mineralized zone below the present zone of oxidation. Also, known uranium mineralization above the permanent water table is weak and erratically distributed. I am in accord with the recommendations of the examining personnel.

The application and property of Western Gold and Uranium, Inc., have been discussed with members of the Salt Lake City office of the Atomic Energy Commission.

Stephen R. Wilson
Stephen R. Wilson

Reviewed by
DMEA OPERATING COMMITTEE
2-6-56
(date)

Enclosures

cc: J. B. Clemmer

700

FILE COPY
Surname: Ching

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

JAN 20 1956

Mr. Richard W. Ince
Western Gold and Uranium, Inc.
42 Broadway
New York 4, New York

Re: Docket No. DMEA-3974 (Uranium)
Silver Reef Mines
Washington County, Utah

Dear Mr. Ince:

This is in response to your letter of January 18, 1956, addressed to Mr. Michael Ching.

Our field representatives examined your property on October 11, 1955 and we are informed that a report of examination is nearly completed. We regret that there has been some delay in the preparation of the report but you may be assured that we will give prompt attention to your application as soon as the report is received in this Office. Once the report is received, you may expect to hear from us in a comparatively short time.

We are pleased to learn that the questions raised by Mr. Ching during your visit in Washington were satisfactorily explained to our field representatives by Mr. Richard Wyman at the time of the field examination.

Sincerely yours,

Ernest Wm. Ellis, Chief
Rare and Miscellaneous
Metals Division

MChing/izm 1-20-56
cc to: Admr.Is Reading File
Docket
Code 700
Mr. Ching
DMEA Field Team, Region III (2)
Messrs. JECrawford, Rm. 3641
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA

WESTERN GOLD & URANIUM, INC.
42 BROADWAY
NEW YORK, 4 N. Y.

WHITEHALL 4-6478

SILVER REEF URANIUM MINES
OFFICE: LEEDS, UTAH

FIRST NATIONAL BANK BUILDING
CARSON CITY, NEVADA

January 18, 1956

Mr. Michael Ching
Rare and Miscellaneous Metals Division
Defense Minerals Exploration Administration
Department of the Interior
Washington, D.C.

Re: Docket DMEA 3974 (Uranium)
Silver Reef Mine
Washington County, Utah

Dear Mr. Ching:

As you are probably aware, since my visit with you on October 7 your representatives have visited the Silver Reef properties of Western Gold & Uranium, Inc. in regard to the above application.

On my last visit to the properties I discussed with Mr. Richard Wyman, our Superintendent, the points you raised in our discussion. I understand from him that these were all satisfactorily answered when your representatives visited the property.

The purpose of this letter is to find out whether you can give me any indication as to the present status of the application, and when we may expect to hear from your Division.

Very truly yours,

Richard W. Ince

RWI/vb

Richard W. Ince

September 30, 1955

Memorandum

To: S. R. Wilson

From: Superintendent, Denver Experiment Station, Reg. III

Subject: DMEA Docket 3974 (Uranium), Western Gold and Uranium, Inc., Silver Reef Mines, Washington County, Utah

The subject application in the amount of $102,786.50 is enclosed herewith. The brochure consists of:

1. Form MF-103 and supplementary information sheets
2. Photocopies of 3 Agreements
3. 2 Maps
4. 2 Photocopies of memo from E. N. Nelson to E. W. Ellis
5. 2 Photocopies of memo from John E. Crawford to E.W.Ellis
6. 2 Photocopies of letter of transmittal from Chairman Operating Committee to Executive Officer
7. Copy of memo of transmittal from Executive Officer to this office

A field examination and suitable report are required. The completed report should be sent directly to the Executive Officer with a copy of your memorandum of transmittal to this office.

W. H. King

Enclosures

Copy to: E. N. Harshman
R. W. Osterstock
W.M. Traver (3)
Sec. Op. Com

September 30, 1955

Memorandum

To: B. R. Wilson

From: Superintendent, Denver Experiment Station, Reg. III

Subject: DMEA Docket 3974 (Uranium), Western Gold and Uranium, Inc., Silver Reef Mines, Washington County, Utah

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5. 2 Photocopies of memo from John E. Crawford to E.W.Ellis
6. 2 Photocopies of letter of transmittal from Chairman Operating Committee to Executive Officer
7. Copy of memo of transmittal from Executive Officer to this office

A field examination and suitable report are required. The completed report should be sent directly to the Executive Officer with a copy of your memorandum of transmittal to this office.

W. H. KING

W. H. King

Enclosures

Copy to: E. N. Harshman
R. W. Osterstock
W.M. Traver (3)

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

September 29, 1955

[illegible] New Customhouse
Denver 2, Colorado

Memorandum

To: W. H. King
R. W. Ostenstock

From: Executive Officer, DMEA Field Team, Region III

Subject: DMEA Docket 3974 (Uranium), Western Gold and Uranium, Inc., Silver Reef Mines, Washington County, Utah

Enclosed is the subject application in the amount of $102,786.50. The application consists of Form MF-103 and accompanying answer sheets, three copies of Agreements, and two maps. Also enclosed is a copy of a letter from the Chairman of the Operating Committee and enclosed memoranda from members of the Uranium Commodity Committee.

A field investigation and suitable report are requested.

W. M. Traver

W. M. Traver

Enclosures

WMC:ab
cc: Sec. Opr. Comm. (2)
Harshman
Docket 3974
Chron.

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

September 29, 1955

224 New Customhouse
Denver 2, Colorado

Memorandum

To: W. H. King
R. W. Osterstock

From: Executive Officer, DMEA Field Team, Region III

Subject: DMEA Docket 3974 (Uranium), Western Gold and Uranium, Inc., Silver Reef Mines, Washington County, Utah

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A field investigation and suitable report are requested.

W. M. Traver

W. M. Traver

Enclosures

HMC:ab
cc: Sec. Opr. Comm. (2)
Harshman
Docket 3974
Chron.

Surname copy

700

Ellis
Guhon
Nelson
Selfridge

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

SEP 23 1955

Western Gold & Uranium, Inc.
Box 27
Leeds, Utah

Re: Docket No. DMEA-397 (Uranium)
Silver Reef Mines
Washington County, Utah

Gentlemen:

The application for assistance in exploring the subject property in Washington County, Utah, under the captioned docket number, has been reviewed by the Base and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. It has been referred to the Executive Officer of Region III at the following address:

Mr. W. M. Trover
Executive Officer
DMEA Field Team, Region III
12th New Customhouse Building
Denver 2, Colorado

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

Sincerely yours,

Frank E. Johnson

ACTING Administrator

Copy to: Mr. Ralph G. Dawson, President
Western Gold & Uranium, Inc.
42 Broadway
New York 4, New York

MChing/EWEllis/sm/gla
9-21-55
cc to: Admr.'s Reading File
Docket
Code 700
Mr. Ching
DMEA Field Team, Region III (2)

Surname 700

Ellis
Nelson
Selfridge
Johnson

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

Code 700
Mr. Ching

Messrs. J.E.Crawford,Rm.3641
T.H.Kiilsgaard,Rm.5222
J.O.Hosted,Rm.3210,GSA

Admr. Reading File
Operating Committee
Docket

MChing:EWEllis:am
9-21-55

cc to:

SEP 23 1955

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

Re: Docket No. DMEA-3974 (Uranium)
Western Gold and Uranium, Inc.
Silver Reef Mines
Washington County, Utah

Dear Mr. Traver:

The subject application is being referred to you for investigation, a field examination if warranted, and recommendation. A copy of the application was forwarded to you on September 9.

Enclosed are two copies each of memoranda by N. E. Nelson and John E. Crawford of the Uranium Commodity Committee, dated September 13, and September 16, 1955, respectively.

In the event a contract is recommended Consents to Lien would be required of David Glenn Beal and Wilma C. Beal, and Riley C. Savage and Eva Rose Savage.

It is suggested that the Applicant be required to clarify the description of the land under Article 3(a) with respect to claims which extend out of sections 1 and 6 or lie partly in section 1 and partly in section 6. It should also be determined whether there are any conflicts due to superimposed claims.

There appears to be no point in including as part of the project, the two small fractions of land in the NW¼ of the SW¼ of the SW¼ of Section 6. On the other hand, it would be highly desirable to include the two claims Barbee Lot 43 and Walker Lot 42 if that can be done.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Enclosures

APPROVED:

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

N. E. Nelson (GCS)
Member, Geological Survey

9/20/55 g2a

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

September 16, 1955

Memorandum

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

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

Subject: Application for assistance, DMEA Docket 3974, Western Gold & Uranium, Inc., Silver Reef Mines, Washington County, Utah

I have reviewed the attached application, Western Gold & Uranium, Inc., DMEA Docket 3974; and I have discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

The applicant has applied for DMEA assistance in exploring for uranium on a group of claims near Leeds, Utah; the proposed program would consist of 25,000 feet of drilling at a total estimated cost of $102,786.50. The justification of this drilling program, as given by the applicant, is to prove the existence of ore mineralization and to locate ore-bodies, if any are present.

The exploration program appears to be a prospecting venture.

Mr. Hosted recommends that the application be sent to the Field Team and that they be requested to consult with E. E. Thurlow, Chief, Salt Lake City Exploration Branch, Atomic Energy Commission.

The applicant stated in his application that he could not demonstrate the actual existence of pitchblende on subject claims. I am hesitant to recommend a field examination because no evidence was presented that would indicate the presence of uranium. I believe some work by the applicant to determine the presence of mineralization or an ore guide on subject claims would be in order before this application could be classified as an exploration program.

James Paone
for John E. Crawford

Attachment

9/14/55 gla

IN REPLY REFER TO:

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

RECEIVED
SEP 14 1955

September 13, 1955

Re: DMEA 3974
Western Gold & Uranium, Inc.
Silver Reef Mines
Washington Co., Utah
$102,786.50 - Uranium

Memorandum

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

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

Subject: Review of application.

The application concerns the drilling of 25,000 feet of rotary and core bit hole, to prove the existence of a horizon of primary ores down dip from a near outcrop zone containing oxidized uranium, copper and silver minerals.

The application says there are 34,800 tons of carnotite type ore averaging .10 U_3O_8 and 11.00 oz. silver per ton are in the adjacent ground to the south. The ore was indicated by 43,000 feet of wagon and 10,000 feet of rotary drill hole. The bottom of the ore is near or at the water table.

If correctly interpreted, the applicant's geologist, Mr. Wyman, reasons that about 450 feet lower than the outcrop of the silver-uranium bearing Silver Reef sandstone (Chinle) there may be primary ore.

The theory advanced appears to possess merit, but it might be well to investigate its validity before entering upon a 25,000-foot drilling program. A staged project could perhaps be justified even though the existence of pitchblende ore at the assumed horizon has not been demonstrated. An appraisal of the theory by the Field Team is indicated. If approved, consideration of further investigation would be in order.

Referral to the Field Team is recommended.

N. E. Nelson

N. E. Nelson

IN REPLY REFER TO:

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

RECEIVED
SEP 14 1955

September 13, 1955

Re: DMEA 3974
Western Gold & Uranium, Inc.
Silver Reef Mines
Washington Co., Utah
$102,786.50 - Uranium

Memorandum

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

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

Subject: Review of application.

The application concerns the drilling of 25,000 feet of rotary and core bit hole, to prove the existence of a horizon of primary ores down dip from a near outcrop zone containing oxidized uranium, copper and silver minerals.

The application says there are 34,800 tons of carnotite type ore averaging .10 U_3O_8 and 11.00 oz. silver per ton are in the adjacent ground to the south. The ore was indicated by 43,000 feet of vugs and 10,000 feet of rotary drill hole. The bottom of the ore is near or at the water table.

If correctly interpreted, the applicant's geologist, Mr. Wynn, reasons that about 450 feet lower than the outcrop of the silver-uranium bearing Silver Reef sandstone (Chinle) there may be primary ore.

The theory advanced appears to possess merit, but it might be well to investigate its validity before entering upon a 25,000-foot drilling program. A staged project could perhaps be justified even though the existence of pitchblende ore at the assumed horizon has not been demonstrated. An appraisal of the theory by the Field Team is indicated. If approved, consideration of further investigation would be in order.

Referral to the Field Team is recommended.

H. E. Nelson

H. E. Nelson

HENelson:iml
G-9/13/55
cc: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641
J. G. Hosted, 3910

September 9, 1955

Subject: DMEA 3974
Re: Exploration Assostance
Silver Reef Mines

Western Gold & Uranium, Inc.
Box 27
Leeds, Utah

Gentlemen:

The receipt of your application dated August 31, 1955 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA 3874 and referred to the Rare & Miscellaneous Division.

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

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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

Not to be filled in by applicant

Docket No. DMEA 3974
Metal or Mineral Uranium
Date Received 9-9-55
Estimated Cost $102,786.50
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: Western Gold & Uranium, Inc., Box 27, Leeds, Utah. Incorporated under laws of Nevada
President, Ralph G. Brown, 42 Broadway, New York 4, N. Y.
Vice Pres. and Treas. David P. Shirra, Grand Canyon, Arizona
Secretary, Berene Backus

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

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

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

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

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

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

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise The company controls the mineral rights of the first two properties under purchase agreements. The company owns the mineral rights on the second two properties.

(*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. Attached hereto: Copies of Beal and Savage agreements.

(*e*) If you own the land, describe any liens or encumbrances on it No liens or encumbrances.

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

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 supplementary sheet attached for answers to questions 4(a) to 4(e), inclusive

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

(*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. Maps attached. 1. Property map. 2. Proposed work.

(*c*) The work will start within 60 days and be completed within 18 months from the date of an exploration project contract.

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

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: Attached.

(*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.). See supplementary sheet attached.

(*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. See supplementary sheet attached

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

(*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. See supplementary sheet attached.

(*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. See supplementary sheet attached.

(*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. Attached.

(*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. See supplementary sheet attached.

(*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. See supplementary sheet attached.

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

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

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated August 31, 1955

WESTERN GOLD & URANIUM, INC.
(Applicant)

By Ralph S. Brown
Pres.

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

M F 103 Supplementary
Re: Questions 3(a) and 3(f)

RECEIVED

3 (a) Land on which we wish to explore: NE$\frac{1}{4}$,SE$\frac{1}{4}$,Sec.6,T41S,R13W.
NW$\frac{1}{4}$,SE$\frac{1}{4}$,Sec. 6, T41S,R13W (W.G.&U. has mineral rights under purchase agreement)
NW$\frac{1}{4}$,NW$\frac{1}{4}$,SE$\frac{1}{4}$,SW$\frac{1}{4}$,Sec.6,T41S,R13W. S$\frac{1}{2}$,S$\frac{1}{2}$,NW$\frac{1}{4}$,SE$\frac{1}{4}$,SW$\frac{1}{4}$,Sec.6, T41S,R13W (W.G.&U. owns mineral rights)
Also the following unpatented claims:

		Book	Page No.
In Sec. 6, T41S,R13W:			
	Harris No. 3	X24	388
	Harris No. 4	X24	388
	Harris No. 5	X24	389
	Harris No. 6	X24	389
	Harris No. 7	X24	389
	Harris No. 8	X24	390
	Harris No. 9	X24	390
	Harris No. 10	X24	391
	Wyman No. 3	X24	457
In Sec. 1,T41S,R14W:			
	Harris No. 1	X24	387
	Harris No. 2	X24	388
	Harris No. 4	X24	388
	Ralph No. 1	X24	395
	Ralph No. 2	X24	395
	Ralph No. 3	X24	395
	Ralph No. 4	X24	395
	Ralph No. 5	X24	396
	Ralph No. 6	X24	396
	Ralph No. 7	X24	397
	Angelica No. 1	X24	463
	Angelica No. 2	X24	463
	Angelica No. 3	X24	464

3 (f) See above: 3 (a)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION.

MF-103 Supplementary Sheet re Questions 4(a) to 4(e), inclusive.

4 (a) No mining operations were performed on the above land. On the adjacent land to the south, 43,000 feet of wagon drilling were performed and 10,000 feet of rotary drilling, which blocked out 34,800 tons of ore running .10% U_3O_8, 11.00 oz. Ag., .50% Cu. and .60% V_2O_5.

During 1952, 53, and 54, 641 tons of ore running .315% U_3O_8 were shipped to Marysvale, Utah from the Chloride Chief mine, immediately south. This mine is owned by the company. Workings are accessible.

4 (b) Past production of district:

Unknown tonnage early days (1875-1909) Value, Ag. $8,000,000
1950-1954 Total district production approximately 700 tons of .31% U_3O_8

Ore reserves average .10 U_3O_8 and 11.00 oz. Ag., 34,800 tons.

4 (c) Regarding Geology, Mineralization and Type of Deposit:

Geologic Reasons in favor of Down-Dip Exploration of the Silver Reef Sandstone in its Primary Zone

A. Introduction: Western Gold and Uranium, Inc. has conducted a successful program of exploration for uranium and silver ore bodies at Silver Reef. All of the exploration has been concentrated within the oxidized zone to develop orebodies of the carnotite-type. (meta-tyuyamunite)

The following presentation must necessarily be based on theoretical grounds, and hypothetical reconstruction of the primary ore as based on observation of its oxidized counterpart, as we have little or no data concerning the truly unoxidized ore.

B. Theoretical Considerations: Within the Silver Reef Sandstone, near the nose of the Virgin Anticline, commercially valuable silver and uranium orebodies have been worked. All of these orebodies were found within that part of the Silver Reef member of the Chinle formation that had been bleached, and appears in the outcrop as a buff or grey-green sandstone.

That this is truly an alteration feature and not an original sedimentary facies (as described by Proctor*) can be demonstrated. The progressive alteration of purple clay to a grey-green clay, purple mica to green mica, and pink sandstone to orange and buff sandstone is shown by drill cores.

Cross sections of the drilling done at Silver Reef show the relationship between the amount of alteration of the sandstone and the presence or absence of orebodies. In each case, the individual orebody shows a dual control of fractures and a favorable bed within this alteration halo.

The relation of buff and pale green alteration to orebodies has recently been noted by others at Temple Mountain** and at Big Indian Wash***, both within the Chinle formation. In both cases there also appears to be a fracture control. Both districts are along major anticlines. Both districts had carnotite type ore near the outcrops. Both districts produce pitchblende from a pyritic ore in the primary zone. The principal mineralogic

MF-103 Supplementary
Question 4 (c) cont'd

difference is that the Silver Reef contains silver as well as uranium.

All of the uranium ore mined to date, and that developed by the drilling programs, has been found within the carbonaceous trash beds within the buff alteration zone, either replacing plant remains or impregnating the sandstone. Rusty limonite is closely associated with the ore, and in some cases it is plainly pseudomorphous after pyrite. The presence of limonite spots of this type throughout the buff alteration zone suggests that the original mineralization was more widespread than indicated by present known orebodies.

In reconstructing the primary ore from the oxidized remains, it is reasonable to believe that uranium ores were widespread throughout the sandstone as pitchblende, as in the areas aforementioned, with the same distribution as the pyrite. During oxidation following the erosion of the Virgin Anticline there was a partial leaching of uranium, and reprecipitation within the beds containing carbonaceous debris where the proper reducing conditions were maintained. The relationship between the valence states of uranium and the oxidation potential was explained by R. M. Garrels* (4) at the G.S.A. in Los Angeles, November 1954, and the above would appear to fit the conditions.

From our drilling in the area there appear to be three conditions of the mineralized zone, reasons for which are understood:

1. Zone of oxidation above water table: This is the zone of vadose circulation, with some downward circulation during wet weather, but probably never saturated. The presence of silver, uranium, and copper within this zone is controlled by the presence of suitable carbonaceous debris in the vicinity of through-going fractures. Silver may or may not be associated with carbon.
2. Zone of seasonal fluctuations of the water table. Within this zone there is the poorest chance of finding ore because the water table is constantly moving and actively flushing and colloids or minerals taken into solution. Solution from the primary zone would occur at times of low water table, and reprecipitation near the high water mark would occur to some degree even today. The zone itself would contain only low grade secondary mineralization. Within the zone, however, the residual primary features of the ore attest to a primary mineralization on the same order as those above this zone. The zone of fluctuation is believed to be on the order of 40' vertically.

   The AEC drilled a line of holes on the White Reef which were all the same distance back of the outcrop and all were drilled into this zone. Copper mineralization was heavy in many holes, and the alteration zone and presence of pyrite pseudomorphs showed the nature of the original mineralization.

   Oxidized conditions will persist through this zone and for some distance below.
3. Zone of unoxidized ores: Below the zone of fluctuating water table, there must exist a zone of stagnant water in which reducing conditions are maintained constantly, and in which

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MF-103 Supplementary
Question 4 (c) cont'd

the uranium, silver, and copper exist in their primary orebodies. Uranium would be present in its lower valence forms, probably as pitchblende, vanadium as montrosite, silver as argentite, copper as chalcopyrite or bornite. Such ores have been found in several other localities of strikingly similar geologic setting and mineralogy.

6. Practical Considerations: The experience of other districts is that the primary orebodies are more uniform and larger in size than carnotite oreshoots. A drilling program to intercept the mineralized zone at 450 feet is believed to be a satisfactory approach. Because of the relationship of ore to alteration, the first step would be a line of holes to give a section from which offset holes could be spotted. The spacing on the first line of deep holes should be no more than 200'. The program would thus have a two-fold purpose: first, to prove the existance and type of ore mineralization within the unoxidized zone. Secondly, to locate orebodies within that zone using the data from the first holes to locate others.

We cannot demonstrate the actual existance of pitchblende ores as described above, because of the lack of deep exploration. However, there appears to be a very good chance for such ores on this property, and based on the theoretical application of data gathered from the oxidized zone, the chance appears to be good enough to warrant the expense of drilling a series of holes to test the theoretical and practical aspects of the property.

Accompanying this application are two maps. One showing property lines and one showing the outcrops of Silver Reef Sandstone, dip, previous work, and proposed drill holes of this program totalling 25,000 feet. Offset holes on any ore found will be financed by the company.

Richard V. Wyman

* Proctor, Paul D. "Geology of the Silver Reef (Harrisburg) Mining District", Utah Geol. and Min. Sur. Bull.44, (1953)
** Kerr, Paul F., et al, "Collapse features at Temple Mountain, Utah" Abst. of paper presented at 1955 Annual Meeting of AIME at Conrad Hilton Hotel, Chicago, Feb.14-17, 1955
*** Isachsen, Y. Wm., "Uranium Deposits, Big Indian Wash-Lisbon Valley Area, San Juan County, Utah" Abst. of paper presented at 67th annual meeting of G.S.A., Statler Hotel, Los Angeles, No. 1-3, 1954
*(4) Garrels, R. M., "Thermodynamic Relations amoung the Uranium Oxides and their relations to oxidation states of the uranium ores of the Colorado Plateaus" Abst. of paper presented to 67th annual meeting of G.S.A., Los Angeles, Nov. 1-3, 1954.

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Question 4 (d)

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4 (d) Entire project area is within 2 miles of US91, a paved highway.
Distance to Cedar City, 35 miles, nearest railroad.
Distance to St. George, 17 miles.
Distance to Hurricane, 14 miles.
Distance to Leeds, 2 miles.

4 (e) Manpower supply available locally. Most materials available locally except drill bits, and machine parts which come from Salt Lake or Grand Junction.

The company owns a 15 ac. ft. primary water right.
Southern Utah Power services the area.

5 (d) Operating experience of company:
3½ years operation in exploration and mining at Silver Reef.
Operating experience of supervisors:
Richard V. Wyman, Geologist
2 years geologist New Jersey Zinc Co. exploration division supervising diamond drilling contractors and labor in Big Bug district and Verde district of Arizona.
2 years geologist Cerro de Pasco Corp, 9 months geologist-in-charge Cerro mine, supervising 70 Indians and 5 geologists.
1 3/4 years geologist Western Gold & Uranium, Inc,; supervision of exploration activities, wagon drilling and rotary drilling.

MF-103 Supplementary
Question 6 (a)

6 (a) Independent Contracts: Bulldozer operation - to make roads and prepare drill sites for 50 holes - estimated time required - 200 hrs. @ 8.00 — 1,600.00

6(b) Labor, Supervision & Consultants: All costs based on actual progress records in comparable formations - it is estimated that an average advance of 20' per shift can be maintained throughout the 25,000 foot program, thus requiring 1250 shifts, or approximately 16 months.

1. Combination superintendent - Geologist @ 600.00 per month x 16	9,600.00
3. Driller per shift @ 13.85 x 1250	17,312.50
3. Helpers per shift @ 13.00 x 1250	16,250.00
1. Mechanic @ 400.00 per month	6,400.00

6(c) Operating Materials & Supplies

Gasoline - 40 gallons per shift 40x1250x.272	13,600.00
Lub Oil 1 gallon per shift 1x1250x.86	1,075.00
Grease 1000 pounds @ 1.75	1750.00
Drill steel replacement - 500 feet 2.64/ft.	1,320.00
Tri cone bits - 8000 feet @ .20	1,600.00
Diamond bits - 1700 feet @ .15	2,550.00
Co Core barrels - 16 : 160.00	960.00
Drilling media - 50 tons Bentonite @ 20.00	1,000.00
Electric power for pumping water	500.00

6 (d) Operating Equipment - to be furnished by operator

1. Rotary drill	18000		
2. Water trucks	3000		
1. Utility truck	1000		
Shop equipment	1000	23,000.00	
Suggested use allowance - 1.00 per hour 1250 shiftsx8hrs.x1.00			10,000.00

6 (e) Rehabilitation & Reapirs - None

6 (f) New Buildings, Improvements, Installations - None

6 (g) Miscellaneous

Anticipated Rotary Drill repairs	
2 replacement motors @ 250.00	500.00
Sludge pump replacement parts	1,500.00
Replacement parts for rotary table	1,000.00
Miscellaneous repairs, gears, universals, shafting, hoist parts and cable	1,000.00
Water truck maintenance, tires, tubes and repairs	1,500.00
Analylical work in operators laboratory	1,000.00
Accounting	500.00
Workmen's compensation	1,000.00
Pay roll taxes, employment insurance & 2% company share S.S.	1,500.00

6 (h) Contingencies

Plus 10% to cover errors in estimation	9,344.00
Total	$102,786.50

A G R E E M E N T

THIS AGREEMENT, made and entered into in triplicate this 26 day of May, 1954, by and between, DAVID GLENN BEAL and WILMA C. BEAL, husband and wife, of Leeds, Utah, parties of the first part, hereinafter called the sellers and WESTERN GOLD AND URANIUM, INC., a corporation, with operating office at Leeds, Washington County, Utah, party of the second part, hereinafter called the buyer, WITNESSETH:

WHEREAS, the sellers are the owners of that certain real property hereinafter particularly described, together with the minerals and mineral rights therein and desire to sell and transfer the said minerals and mineral rights to the buyer for the consideration and pursuant to the terms hereinafter set forth, and the buyer desires to purchase and acquire said minerals and mineral rights pursuant to said terms,

NOW, THEREFORE, the sellers, in consideration of the premises and of the promises and covenants on the part of the buyer as hereinafter contained, hereby agree to sell, convey, transfer, and set over to the said buyer and the buyer agrees to purchase on the terms hereinafter set forth, all of the minerals and mineral rights of every kind in, upon, and under that certain tract of land hereinafter particularly described, owned by the sellers and situate in Washington County, State of Utah; together with all rights of way, easements, and appurtenances, including such use of the surface of said land as may be necessary for the extraction and removal of ore and minerals therefrom, it being understood and agreed, however, that there shall be no surface blasting within 500 feet of any present buildings nor upon any presently cultivated land, and further provided that all surface rights are removed and no mining or exploration activity will be carried on upon the surface of the following tract of the hereinafter described land: Beginning at a point on the South boundary fence, 120 feet S60° E from the Southeast corner of the present house, thence approximately 250' N 35° W, thence N 80° W to the West boundary fence.

Said real property is particularly described as follows, to-wit:

PARCEL 1: The Northwest Quarter of the Southeast Quarter (NW¼SE¼) of Section 6, Township 41 South, Range 13 West, Salt Lake Meridian, containing 40 acres, more or less;

PARCEL 2: Lot 9 in the Southwest Quarter of the Southeast Quarter of Section 6, Township 41 South, Range 13 West, Salt Lake Meridian, containing 15 acres, more or less.

Said minerals and mineral rights in said property to be sold to the buyer herein for the purchase price of Three Thousand ($3,000.00) Dollars, lawful money of the United States of America, payable as follows: Five Hundred ($500.00) Dollars paid by the buyer to the sellers upon the execution of this agreement, the receipt whereof is hereby acknowledged by the sellers. The balance of $2500.00 to be paid by the buyer to the sellers from the sale of the production of ore and minerals from said property, at the rate of Ten (10%) per cent of the net smelter returns therefrom and with a minimum guarantee of payments as follows: Not less than $500.00 on or before December 1, 1954, and a like sum each six months thereafter until the entire purchase price has been fully paid. No interest shall be charged on deferred balances provided the payments called for herein are made upon the day whereon the same are due and payable.

It is further understood and agreed by and between the parties hereto as follows:

1. That upon the execution of this agreement, and thereafter while the same remains in good standing, and until a breach or default by the buyer, the buyer shall be entitled to the exclusive possession of said minerals and mineral rights, rights of way, easements, and appurtenances, including the right to use such part of the surface of said land as shall be necessary in the extraction and removal of ore and minerals therefrom and to enjoy and receive all of the income and profits thereof, subject to the provisions hereof; that upon the happening of any breach, the sellers shall have the right to resume

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possession of said property, including all minerals and mineral rights and mineral and sub-surface rights therein and to cancel and to rescind this agreement and to terminate the same and to nullify the rights of the buyers herein and hereunder, in and to said property and to hold and retain all payments theretofore made by the buyers as rental and liquidated damages for the breach hereof, and to resume possession of said premises and property, and to remove and expell the buyer and all persons holding under it, either with or without legal process, or to pursue such other remedy as may be available to the sellers under the law, provided, that the sellers shall first give the buyers at least thirty (30) days written notice of their intention so to do, setting forth in detail wherein the said buyer is in default of its covenants and agreements herein contained, and if, during said thirty day period the buyer shall perform all of his covenants and agreements wherein it is in default, it shall thereby restore this agreement to good standing in the same manner as if no default had occurred.

2. That upon thirty (30) days written notice from the buyer addressed to the sellers at Leeds, Utah, the buyer may terminate this agreement and thereby be exonerated from any further liability hereunder, except for payments then accrued and owing, provided, however, that any payments theretofore made by the buyer to the sellers shall be forfeited to the sellers as rental and liquidated damages pursuant to the provisions hereof.

3. That the buyer shall have the right, and the same is hereby given by the sellers, to undertake and complete such exploration of said claims as it may desire and to authorize such explorations by the Atomic Energy Commission or other Government Agency, and the sellers further agree that the buyer shall have the right and permission is hereby granted by the sellers to the buyer to place a lien against or otherwise encumber any production from said claims resulting from such explorations of said Government Agency, as security for any loans from the Atomic Energy Commission or other Government Agency.

4. That the buyer shall well and faithfully complete all assessment work required by State or Federal Law to maintain the said claims in good standing during the continuance of this agreement, all of which work shall be completed at the expense of the buyer. The buyer further agrees to file, in a timely manner, any and all proofs of labor of affidavits in lieu thereof which shall or may be required pursuant to law, and to bear and pay all of the expenses thereof.

5. That the buyer shall be entitled to claim and have all depletion credit allowed by the Bureau of Internal Revenue incident to the production and sale of ore from said property during the continuance of this agreement.

6. That simultaneously with the tender of the full purchase price hereof, the sellers agree to execute and deliver to the buyer a good and sufficient mineral deed of conveyance of said minerals and mineral rights in said real property, including such use of the surface of said land as may be necessary, with warranty of title and freedom from encumbrances, said deed to particularly describe said property by full legal description. The said sellers further agree, at their expense, to furnish to the buyer a good and sufficient abstract of title brought down to the date of the execution of this agreement showing the title to said minerals and mineral rights vested in the sellers in a marketable condition. The buyer, may, at its option, procure said abstract and deduct the reasonable cost thereof from the final installment on the purchase price hereof, it being understood, however, that in the event the buyer shall elect to terminate this agreement pursuant to the provisions of paragraph 2 hereof, it shall be responsible for and pay the cost of said abstract. The buyer, at its option and expense, may cause said abstract to be examined by a competent attorney and the sellers agree to forthwith clearup any defects, liens, and encumbrances existing against the title to the said minerals and mineral rights.

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7. That the buyer will take good and sufficient care of said minerals and mineral rights in said property during his occupancy thereof, so long as there remains unpaid any balance of the purchase price hereof, and will mine the same according to good mining practice, and that it will not do or wilfully suffer to be done upon said premises or in connection therewith anything that will reduce the value thereof (excepting the extraction of ore) or impair the security of the sellers. That it will preserve all water rights, easements, rights of way, and appurtenances, if any, thereunto belonging and will not allow the commission of waste thereon, or unduly interfer with nor obstruct the sellers in the use of the surface of said property.

8. It is expressly understood and agreed by and between the parties hereto that the buyer accepts the said minerals and mineral rights in said property in their present condition, except as in regard to the condition of the title of the sellers thereto and that there are no representations, covenants, or agreements between the parties hereto except as herein specifically setforth.

9. That the buyer will keep and maintain full, true, and correct records of all production and/or marketing of ore, which records will be opened at all reasonable times for inspection by the sellers, and will render to the sellers regular reports of the net smelter proceeds of all ore mined, smelted, and sold.

10. It is mutually understood and agreed by and between the parties hereto that the rights of way and easements referred to herein which are granted by the sellers to the buyers for gaining access to the said property for mining purposes shall be located at the points and on the routes designated by the sellers, the location thereof to be at such points as will result in the minimum damage to the sellers crops and require the minimum expense on the part of the buyer in making them traversable, and the buyer agrees to pay the reasonable damage to any crops of the sellers arising from the use or improvement of such rights of way and easements.

11. That time and the prompt and faithful performance of each and every obligation of the buyer and the sellers are of the very essence of this agreement.

12. That this agreement shall be binding upon and shall enure to the benefit of the heirs, representatives, successors, and assigns of the respective parties hereto, and that the party hereto found to be in default of any of the material provisions hereof shall pay and discharge all costs, expenses, and a reasonable attorneys fee incurred by the innocent party in enforcing or defending the provisions hereof or in suing for a breach of this agreement.

13. That the buyer, in consideration of the premises and of the covenants on the part of the sellers as herein contained, hereby accepts and agrees to the above terms and conditions and agrees to pay the sums provided above in the manner and at the time set forth.

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

David Glenn Beal

Olivia C. Beal

Sellers, parties of the first part

WESTERN GOLD AND URANIUM, INC.,
a Corporation

David P Sliva

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

On this 26 day of May, 1954, personally appeared before me David Glenn Beal and Wilma C. Beal, husband and wife, two of the signers of the foregoing instrument, who duly acknowledges to me that they executed the same.

Notary Public

My Commission Expires July 15, 1954 Residing at St. George, Utah

STATE OF Utah)
: ss
COUNTY OF Washington)

On this 26 day of May, 1954, personally appeared before me David P. Shirra, who being by me duly sworn, did say that he is the Vice-president and Treasurer of Western Gold and Uranium, Inc., a corporation, and that said instrument was signed in behalf of said corporation by authority of its by-laws and resolution of its board of directors, and the said David P. Shirra acknowledged to me that said corporation executed the same.

Notary Public

My Commission Expires July 15, 1954 Residing at St. George, Utah

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

A G R E E M E N T

THIS AGREEMENT, made and entered into in triplicate, this 7 day of April, 1954, by and between RILEY C. SAVAGE and EVA ROSS SAVAGE, husband and wife, of Leeds, Washington County, State of Utah, parties of the first part, hereinafter called the sellers, and WESTERN GOLD AND URANIUM, INC., a corporation, with operating office at Leeds, Washington County, Utah, party of the second part, hereinafter called the buyer, WITNESSETH:

WHEREAS, the sellers are the owners of that certain real property hereinafter particularly described, together with the minerals and mineral rights therein and desire to sell and transfer the said minerals and mineral rights to the buyer for the consideration and pursuant to the terms hereinafter set forth, and the buyer desires to purchase and acquire said minerals and mineral rights pursuant to said terms.

NOW, THEREFORE, the sellers, in consideration of the premises and of the promises and covenants on the part of the buyer as hereinafter contained, hereby agree to sell, convey, transfer, and set over to the said buyer and the buyer agrees to purchase on the terms hereinafter setforth, all of the minerals and mineral rights of every kind in, upon, and under that certain tract of land hereinafter particularly described owned by the sellers and situate in Washington County, State of Utah; together with all rights of way, easements and appurtenances, including such use of the surface of said land as may be necessary for the extraction and removal of ore and minerals therefrom. Said real property is particularly described as follows, to-wit:

> The Northeast Quarter of the Southeast Quarter (NE¼SE¼) of Section 6, Township 41 South, Range 13 West, Salt Lake Meridian, containing 40 acres, more or less.

Said minerals and mineral rights in said property to be sold to the buyer herein for the purchase price of Two Thousand ($2,000.00) Dollars, lawful money of the United States of America, payable as follows: Two Hundred ($200.00) Dollars paid by the buyer to the sellers upon the execution of this agreement, the receipt whereof is hereby acknowledged by the sellers. The balance of Eighteen Hundred ($1800.00) Dollars to be paid by the buyer to the sellers from the sale of the production of ore and minerals from said property, at the rate of Ten (10%) per cent of the net smelter returns therefrom, and with a minimum guarantee of payments as follows: Not less than $200.00 on or before one year from date and a like sum on or before the anniversary date hereof thereafter until the entire purchase price has been fully paid. No interest shall be charged on deferred balances provided the payments called for herein are made upon the day whereon the same are due and payable.

It is further understood and agreed by and between the parties hereto as follows:

1. That upon the execution of this agreement, and thereafter while the same remains in good standing, and until a breach or default by the buyer, the buyer shall be entitled to the exclusive possession of said minerals and mineral rights, rights of way, easements, and appurtenances, including the right to use such part of the surface of said land as shall be necessary in the extraction and removal of ore and minerals therefrom and to enjoy and receive all of the income and profits thereof, subject to the provisions hereof; that upon the happening of any breach, the sellers shall have the right to resume possession of said property, including all minerals and mineral rights and mineral andsub-surface rights therein and to cancel and to rescind this agreement and to terminate the same and to nullify the rights of the buyer herein and hereunder, in and to said property and to hold and retain all payments theretofore made by the buyer as rental and liquidated damages for the breach hereof, and to resume possession of said premises and property, and to

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remove and expell the buyer and all persons holding under it, either with or without legal process, or to pursue such other remedy as may be available to the sellers under the law, provided, that the sellers shall first give the buyer at least thirty (30) days written notice of their intention so to do, setting forth in detail wherein the said buyer is in default of its covenants and agreements herein contained, and if, during said thirty day period the buyer shall performall of his covenants and agreements wherein it is in default, it shall thereby restore this agreement to good standing in the same manner as if no default had occurred.

2. That upon thirty (30) days written notice from the buyer addressed to the sellers at Leeds, Utah, the buyer may terminate this agreement and thereby be exonerated from any further liability hereunder, except for payments then accrued and owing, provided, however, that any payments theretofore made by the buyer to the sellers shall be forfeited to the sellers as rental and liquidated damages pursuant to the provisions hereof.

3. That the buyer shall have the right, and the same is hereby given by the sellers, to undertake and complete such exploration of said claims as it may desire and to authorize such explorations by the Atomic Energy Commission or other Government Agency, and the sellers further agree that the buyer shall have the right and permission is hereby granted by the sellers to the buyer to place a lien against or otherwise encumber any production from said claims resulting from such explorations of said government Agency, as Security for any loans from the Atomic Energy Commission or other Government Agency.

4. That the buyer shall well and faithfully complete all assessment work required by State or Federal Law to maintain the said claims in good standing during the continuance of this agreement, all of which work shallbe completed at the expense of the buyer. The buyer further agrees to file, in a timely manner, any and all proofs of labor or affidavits in lieu thereof which shall or may be required pursuant to law, and to bear and pay all of the expenses thereof.

5. That the buyer shall be entitled to claim and have all depletion credit allowed by the Bureau of Internal Revenue incident to the production and sale of ore from said property during the continuance of this agreement.

6. That simultaneously with the tender of the full purchase price hereof, the sellers agree to execute and deliver to the buyer a good and sufficient mineral deed of conveyance of said minerals and mineral rights in said real property, including such use of the surface of said land as may be necessary, with warranty of title and freedom from encumbrances, said deed to particularly describe said property by full legal description. The said sellers further agree, at their expense, to furnish to the buyer a good and sufficient abstract of title brought down to the date of the execution of this agreement showing the title to said minerals and mineral rights vested in the sellers in a marketable condition. The buyer, may at its option, procure said abstract and deduct the reasonable cost thereof from the final installment on the purchase price hereof, it being understood, however, that in the event the buyer shall elect to terminate this agreement pursuant to the provisions of paragraph 2 hereof, it shall be responsible for and pay the cost of said abstract. The buyer, at its option and expense, may cause said abstract to be examined by a competent attorney and the sellers agree to forthwith clearup any defects, liens, and encumbrances existing against the title to the said minerals and mineral rights.

7. That the buyer will take good and sufficient care of said minerals and mineral rights in said property during his occupancy thereof, so long as there remains unpaid any balance of the purchase price hereof, and will mine the same according to good mining practice, and that it will not do or wilfully suffer to be done upon said premises or in connection therewith anything that will reduce the value thereof (excepting the extraction of ore)or impair the

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51 NORTH MAIN ST.
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security of the sellers. That it will preserve all water rights, easements, rights of way, and appurtenances, if any, thereunto belonging and will not allow the commission of waste thereon, or unduly interfer with nor obstract the sellers in the use of the surface of said property.

8. It is expressly understood and agreed by and between the parties hereto that the buyer accepts the said minerals and mineral rights in said property in their present condition, except as in regard to the condition of the title of the sellers thereto and there are no representations, covenants, or agreements between the parties hereto except as herein specifically set forth.

9. That the buyer will keep and maintain full, true, and correct records of all production and/or marketing of ore, which records will be opened at all reasonable times for inspection by the sellers, and will render to the sellers regular reports of the net smelter proceeds of all ore mined, smelted, and sold.

10. That time and the prompt and faithful performance of each and every obligation of the buyer and the sellers are of the very essence of this agreement.

11. That this agreement shall be binding upon and shall enure to the benefit of the heirs, representatives, successors, and assigns of the respective parties hereto, and that the party hereto found to be in default of the material provisions hereof shall pay and discharge all costs, expenses, and a reasonable attorneys fee incurred by the innocent party in enforcing or defending the provisions hereof or in suing for a breach of this agreement.

12. That the buyer, in consideration of the premises and of the covenants on the part of the sellers as herein contained, hereby accepts and agrees to the above terms and conditions and agrees to pay the sums provided above in the manner and at the time set forth.

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

Eva Ross Savage

Riley C. Savage

Sellers, parties of the first part

WESTERN GOLD AND URANIUM, INC.,
A Corporation

David P. Sierra

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

On this 7 day of April, 1954, personally appeared before me Riley C. Savage and Eva Ross Savage, husband and wife, two of the signers of the foregoing instrument, who duly acknowledged to me that they executed the same.

Notary Public

My Commission Expires July 15, 1954 Residing at St. George, Utah

State of Utah)
: ss
County of Washington)

On this 29 day of April, 1954, personally appeared before

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

David P. Shirra, who being by me duly sworn, did say that he is the Vice-President and Treasurer of Western Gold and Uranium, Inc., a corporation, and that said instrument was signed in behalf of said corporation by authority of its b -laws and resolution of its board of directors, and the said David P. Shirra acknowledged to me that said corporation executed the same.

Notary Public

My Commission Expires July 15, 1954 Residing at St. George, Utah

HAFEN AND NELSON
ATTORNEYS AND
COUNSELORS AT LAW
51 NORTH MAIN ST.
ST. GEORGE, UTAH

A G R E E M E N T

THIS AGREEMENT, made and entered into in triplicate, this 23 day of July, 1953, by and between RILEY C. SAVAGE and EVA ROSS SAVAGE, husband and wife, of Leeds, Utah, parties of the first part, hereinafter called the Sellers and WESTERN GOLD MINES, INC., a corporation, with operating office at Leeds, Washington County, Utah, party of the second part hereinafter called the Buyer, WITNESSETH:

WHEREAS, the Sellers are the owners of that certain real property hereinafter particularly described, together with the minerals and mineral rights therein and desire to sell and transfer the said minerals and mineral rights to the Buyer for the consideration and pursuant to the terms hereinafter set forth, and the Buyer desires to purchase and acquire said minerals and mineral rights pursuant to said terms.

NOW, THEREFORE, the Sellers, in consideration of the premises and of the promises and covenants and on the part of the Buyer as hereinafter contained, hereby agree to sell, convey, transfer, and set over to the said Buyer and the Buyer agrees to purchase on the terms hereinafter setforth, all of the minerals and mineral rights of every kind in, upon, and under those certain tracts of land hereinafter particularly described owned by the Sellers and situate in Washington County, State of Utah; together with all rights of way, easements, and appurtenances, including such use of the surface of said land as may be necessary for the extraction and removal of ore and minerals therefrom. Said real property is particularly described as follows:

The SE¼ SE¼ of Section 6, Township 41 South, Range 13 West, S.L.M., containing 40 acres, more or less;

ALSO

The W½ SW¼ SE¼; the SE¼ SW¼; and the SW¼ SW¼ of Section 5, Township 41 South, Range 13 West, S.L.M., excepting approximately 13 acres of the said SW¼ SW¼ of said Section 5 heretofore conveyed by the Sellers herein to A. A. Eastman, leaving a net acreage included in this agreement of approximately 77 acres, more or less, in said Section 5.

Said minerals and mineral rights in said property to be sold to the Buyer herein for the purchase price of Six Thousand ($6,000.00) Dollars, lawful money of the United States of America, payable as follows: One Thousand ($1000.00) Dollars paid by the Buyer to the Sellers upon the execution of this agreement, the receipt whereof is hereby acknowledged by the Sellers. The balance of Five Thousand and no/100 ($5000.00) Dollars to be paid by the Buyer to the Sellers from the proceeds from the sale of the production of ore and minerals from said property, at the rate of Ten (10%) per cent of the net smelter returns therefrom, and with a minimum guarantee of payments as follows: Not less than $500.00 on or before two years from date, and a like sum on or before the anniversary date hereof thereafter until the entire purchase price has been fully paid.

It is further understood and agreed by and between the parties hereto as follows:

1. That upon the execution of this agreement, and thereafter while the same remains in good standing, and until a breach or default by the Buyer, the Buyer shall be entitled to the exclusive possession of said minerals and mineral rights, rights of way, easements, and appurtenances, including the right to use such part of the surface of said land as shall be necessary in the extraction and removal of ore and minerals therefrom and to enjoy and receive all of the income and profits thereof, subject to the provisions hereof; that upon the happening of any breach, the Sellers shall have the right to resume possession of said property, including all minerals and mineral rights and mineral and sub-surface rights therein and to cancel and to rescind this agreement and to terminate the same and to nullify the rights of the Buyer herein

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and hereunder, in and to said property and to hold and retain all payments theretofore made by the Buyer as rental and liquidated damages for the breach hereof, and to resume possession of said premises and property, and to remove and expell the Buyer and all persons holding under it, either with or without legal process, or to pursue such other remedy as may be available to the sellers under the law, provided, that the Sellers shall first give the Buyer at least thirty (30) days written notice of their intention so to do, setting forth in detail wherein the said Buyer is in default of its covenants and agreements herein contained, and if, during said thirty day period the Buyer shall perform all of his covenants and agreements wherein it is in default, it shall thereby restore this agreement to good standing in the same manner as if no default had occurred.

2. That upon thirty (30) days written notice from the Buyer addressed to the Sellers at Leeds, Utah, the Buyer may terminate this agreement and thereby be exonerated from any further liability hereunder, except for payments then accrued and owing, provided, however, that any payments theretofore made by the Buyer to the Sellers shall be forfeited to the Sellers as rental and liquidated damages pursuant to the provisions hereof.

3. That the Buyer shall have the right, and the same is hereby given by the Sellers, to undertake and complete such exploration of said claims as it may desire and to authorize such explorations by the Atomic Energy Commission or other Government Agency, and the Sellers further agree that the Buyer shall have the right and permission is hereby granted by the Sellers to the Buyer to place a lien against or otherwise encumber any production from said claims resulting from such explorations of said Government Agency, as security for any loans from the Atomic Energy Commission or other Government Agency.

4. That the Buyer shall well and faithfully complete all assessment work required by State or Federal Law to maintain the said clims in good standing during the continuance of this agreement, all of which work shall be completed at the expense of the Buyer. The Buyer further agrees to file, in a timely manner, any and all proofs of labor or affidavits in lieu thereof which shall or may be required pursuant to law, and to bear and pay all of the expenses thereof.

5. That the Buyer shall be entitled to claim and have all depletion credit allowed by the Bureau of Internal Revenue incident to the production and sale of ore from said property during the continuance of this agreement.

6. That simultaneously with the tender of the full purchase price hereof, the Sellers agree to execute and deliver to the Buyer a good and sufficient mineral deed of conveyance of said minerals and mineral rights in said real property, including such use of the surface of said land as may be necessary for the extraction and removal of ore and minerals therefrom, with warranty of title and freedom from encumbrances, said deed to particularly describe said property by full legal description.

7. That the Buyer will take good and sufficient care of said minerals and mineral rights in said property during his occupancy thereof, so long as there remains unpaid any balance of the purchase price hereof, and will mine the same according to good mining practice, and that it will not do or wilfully suffer to be done upon said premises or in connection therewith anything that will reduce the value thereof (excepting the extraction of ore) or impair the security of the Sellers. That it will preserve all water rights, easements rights of way, and appurtences, if any, thereunto belonging and will not allow the commission of waste thereon, or unduly interfer with nor obstract the Sellers in the use of the surface of said property.

8. It is expressly understood and agreed by and between the parties hereto that the Buyer accepts the said minerals and mineral rights in said property in their present condition, except as in regard to the condition of the title of the Sellers thereto and there are no representations, covenants, or agreements between the parties hereto except as herein specifically setforth.

9. That the Buyer will keep and maintain full, true, and correct records

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of all production and/or marketing of ore, which records will be opened at all reasonable times for inspection by the Sellers, and will render to the Sellers regular reports of the net smelter proceeds of all ore mined, smelted, and sold.

10. That time and the prompt and faithful performance of each and every obligation of the Buyer and the Sellers are of the very essence of this agreement.

11. That this agreement shall be binding upon and shall enure to the benefits of the heirs, representatives, successors, and assigns of the respective parties hereto, and that the party hereto found to be in default of any of the material provisions hereof shall pay and discharge all costs, expenses, and a reasable attorneys fee incurred by the innocent party in enforcing or defending the provisions hereof or insuing for a breach of this agreement.

12. That the Buyer, in consideration of the premises and of the covenants on the part of the Sellers as herein contained, hereby accepts and agrees to the above terms and conditions and agrees to pay the sums provided above in the manner and at the time setforth.

IN WITNESS WHEREOF, the parties have hereunto set their hands the 29 day of July, 1953.

Riley O. Savage

Eva Ross Savage

Sellers, parties of the first part

ATTEST:

Berene Barkus
Secretary

WESTERN GOLD MINES, INC., a corporation

David P. Shirra
Vice Pres. & Treasurer

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

On this 29 day of July, 1953, personally appeared before me Riley O. Savage and Eva Ross Savage, husband and wife, two of the signers of the foregoing instrument, who duly acknowledged to me that they executed the same.

R. Pendry Nelson
NOTARY PUBLIC

My Commission expires July 15, 1954 Residing at St. George, Utah

STATE OF UTAH)
: ss
COUNTY OF WASHINGTON)

On this 29 day of July, 1953, personally appeared before me David P. Shirra, who being by me duly sworn, did say that he is the Vice Pres. & Treasurer of Western Gold Mines, Inc., a corporation, and that said instrument was signed in behalf of said corporation by authority of its by-laws and resolution of its board of directors, and the said David P. Shirra acknowledged to me that said corporation executed the same.

R. Pendry Nelson
NOTARY PUBLIC

My Commission expires July 15, 1954 Residing at St. George, Utah

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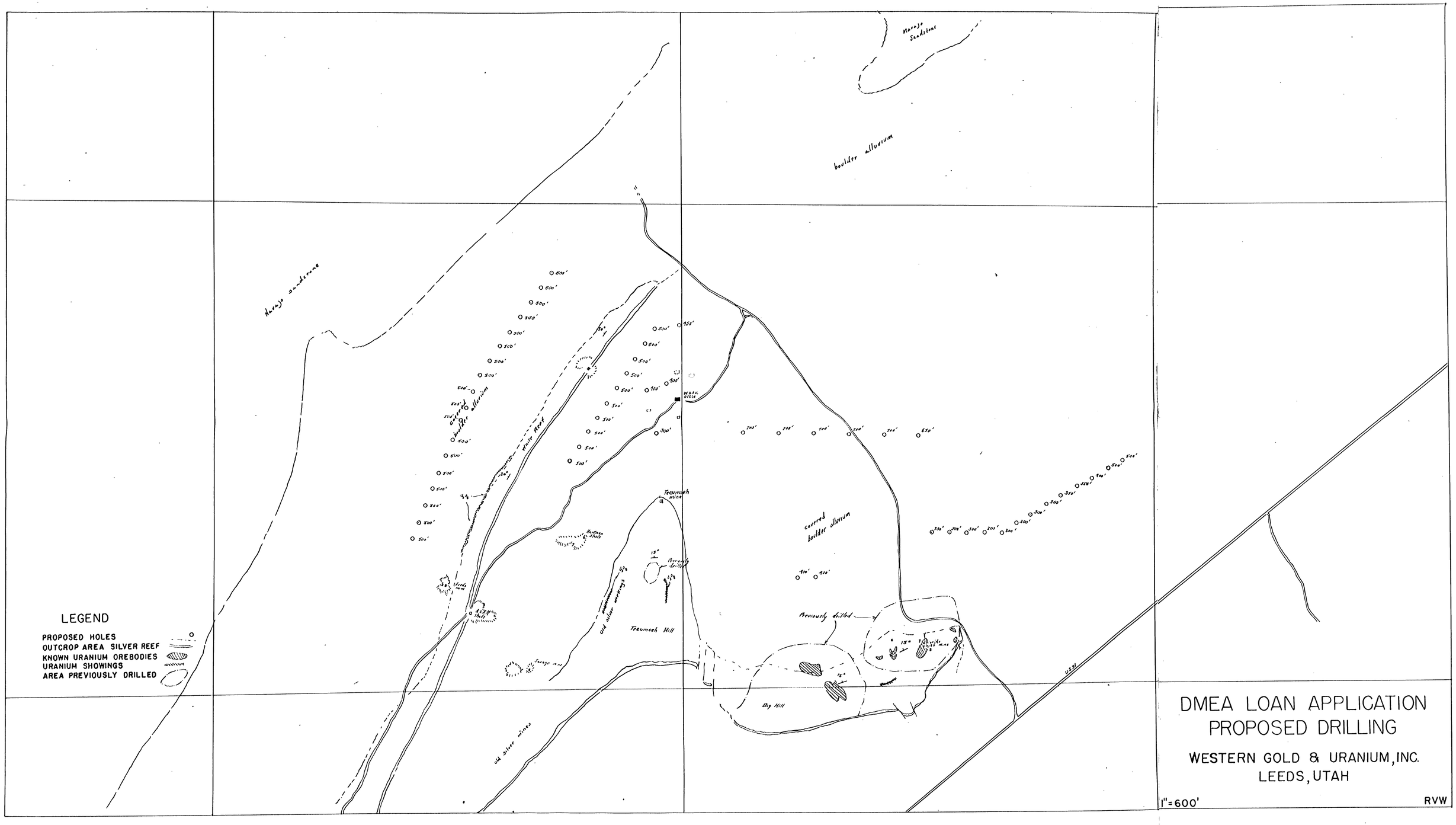
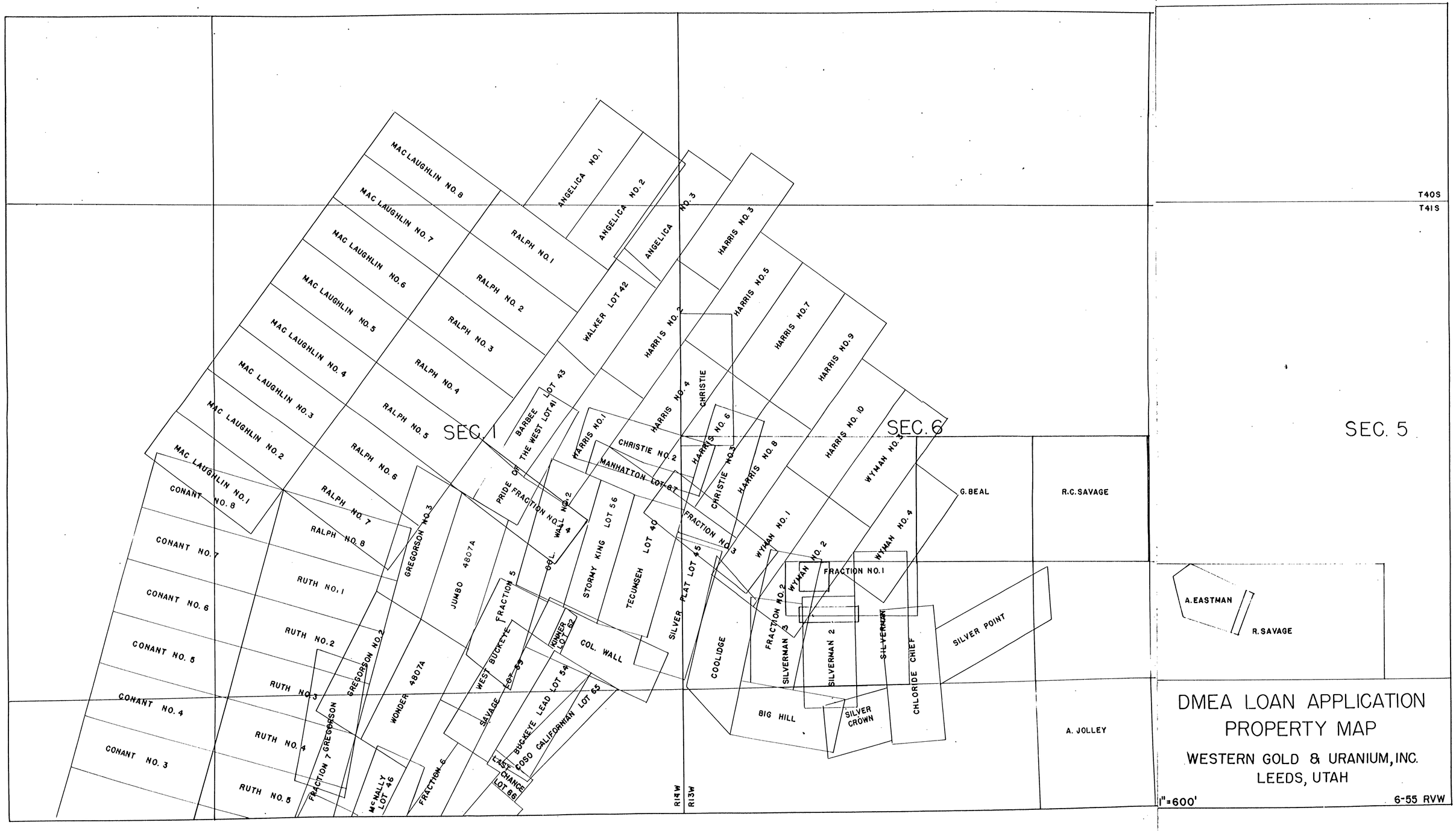
ST. GEORGE, UTAH


Navajo Sandstone
boulder alluvium
Navajo sandstone
covered boulder alluvium
Silver Reef
Tecumseh mine
Tecumseh Hill
old silver workings
old silver mines
covered boulder alluvium
Previously drilled
Big Hill
W.G.U. office
U.S.91
LEGEND
PROPOSED HOLES
OUTCROP AREA SILVER REEF
KNOWN URANIUM OREBODIES
URANIUM SHOWINGS
AREA PREVIOUSLY DRILLED
DMEA LOAN APPLICATION
PROPOSED DRILLING
WESTERN GOLD & URANIUM, INC.
LEEDS, UTAH
1"=600'
RVW

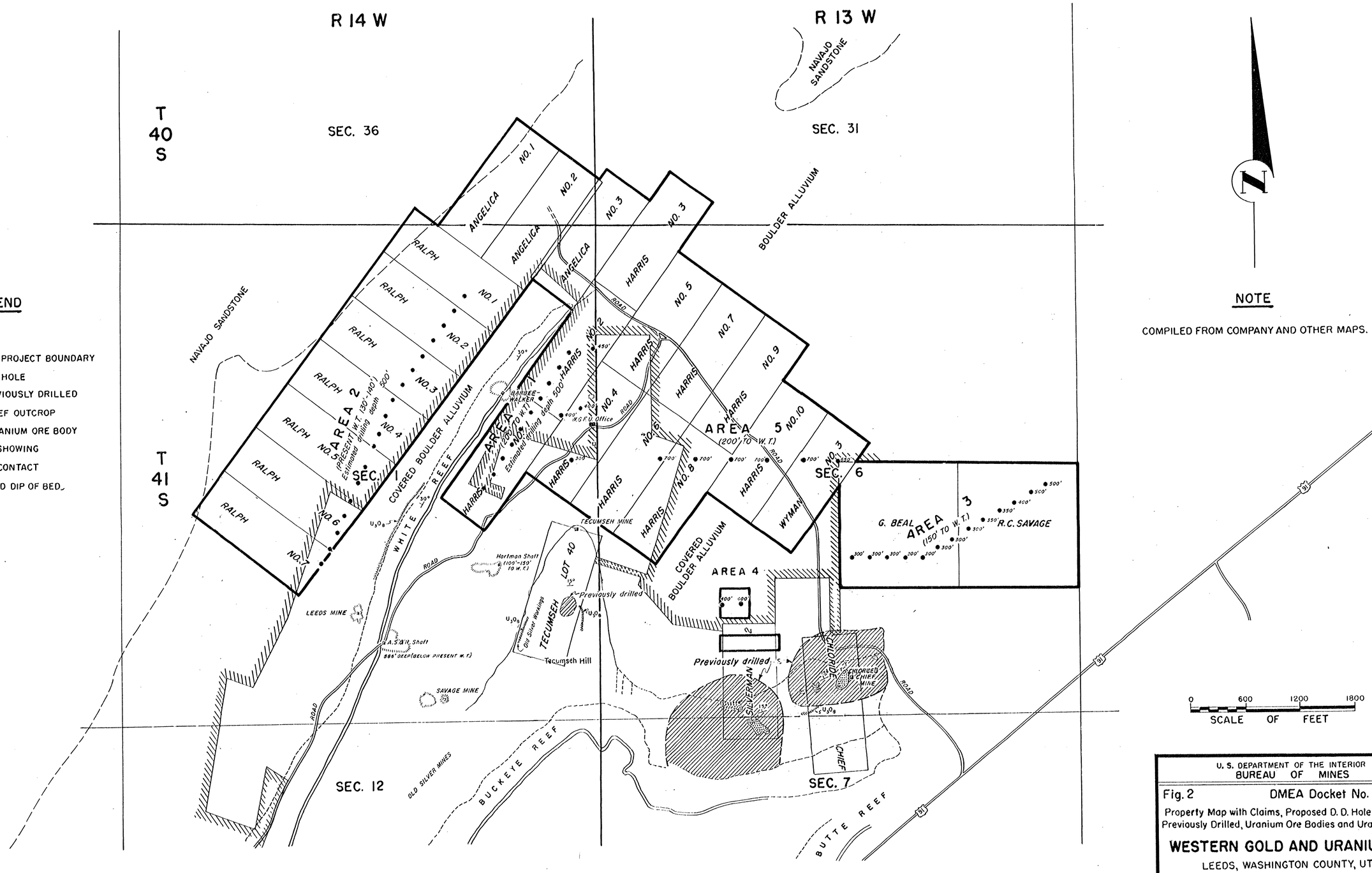


DMEA LOAN APPLICATION PROPERTY MAP

WESTERN GOLD & URANIUM, INC.
LEEDS, UTAH

1" = 600'

6-55 RVW



U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Fig. 2 DMEA Docket No. 3974

Property Map with Claims, Proposed D. D. Holes, Areas Previously Drilled, Uranium Ore Bodies and Uranium Showings

WESTERN GOLD AND URANIUM, INC.

LEEDS, WASHINGTON COUNTY, UTAH

ENGINEER: *Millard M. GILKEY*	DATE: JAN. 17, 1956
DRAWN: JAN., 1956; BY: A.P.T.S.	1900 - 370 - C
CHECKED:	

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET NO. 3974

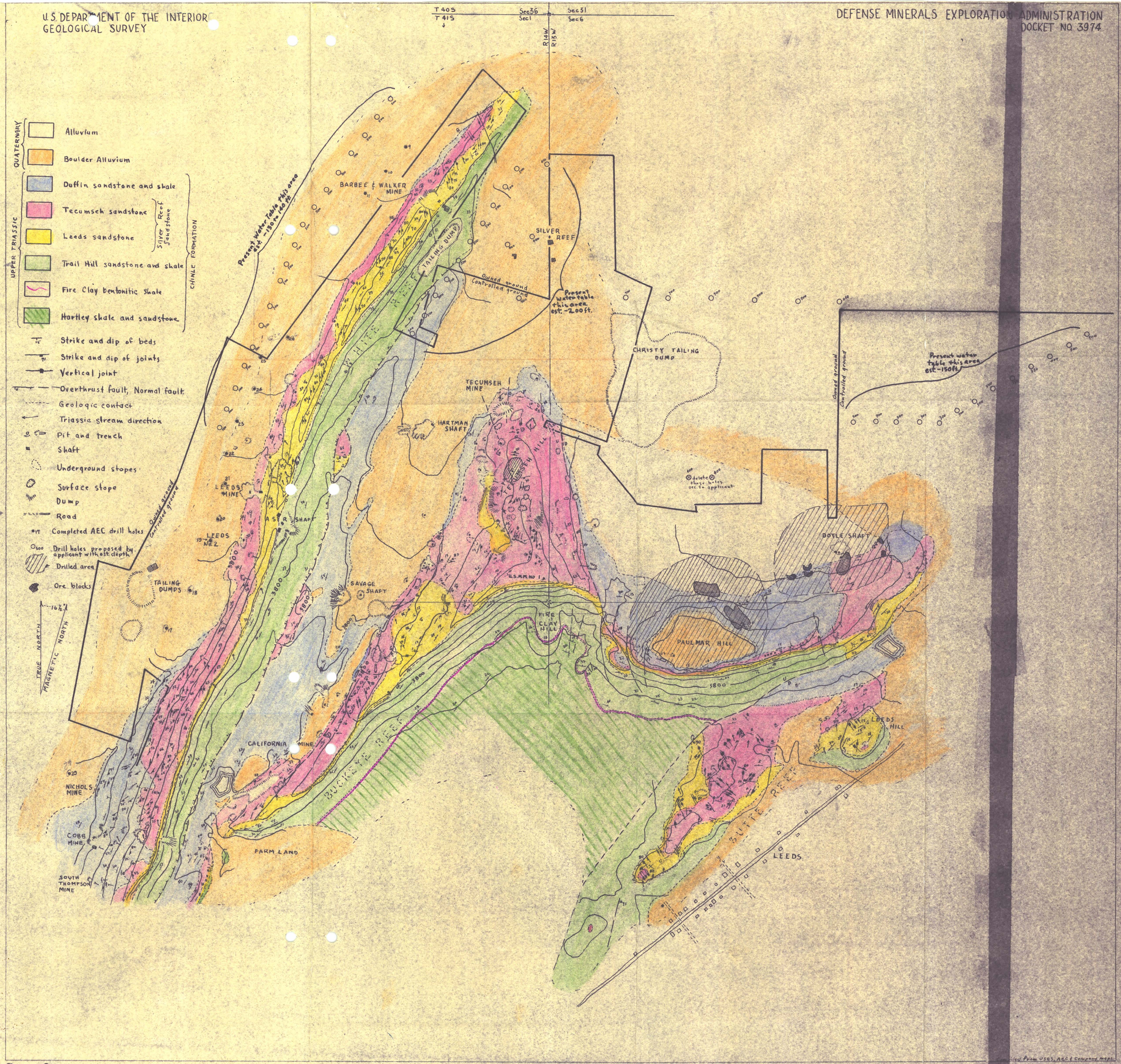


Figure 2

GEOLOGIC MAP OF WESTERN GOLD & URANIUM INC. PROPERTY, SILVER REEF DISTRICT, WASHINGTON COUNTY, UTAH

Compiled from USGS, AEC & Company maps.