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

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Pathfinder Uranium Corporation
904 Walker Bank Building
Salt Lake City, Utah

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

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

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

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

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract See attached sheet and Exhibit 1, of Consent to Lien.

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

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

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

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

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

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

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

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

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

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

16—66551-1

For information on category No. 4, see attached sheet.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated 12/20/54, 195__

PATHFINDER URANIUM CORPORATION
(Applicant)

By [signature]
Clark L. Wilson
Vice President & General Manager

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

Pathfinder Uranium Corporation
904 Walker Bank Building
Salt Lake City, Utah

Form
MF-103

UNITED STATES DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

1. Name of Applicant:

(a.) Pathfinder Uranium Corporation

904 Walker Bank Building

Salt Lake City, Utah

(b.) A Utah Corporation incorporated under the laws of the State of Utah on the 15th day of June, 1954.

(c.) W. H.H. Cranmer, President and Director

3607 Canyon Way

Salt Lake City, Utah

Clark L. Wilson, Vice-President and General Manager

1781 Yuma Street

Salt Lake City, Utah

Frank Earl Scott, Vice-President and Director

32 Cottage Grove

Wallace, Idaho

Robert L. Cranmer, Secretary-Treasurer

2193 Laird Way

Salt Lake City, Utah

Pathfinder Uranium Corporation
904 Walker Bank Building
Salt Lake City, Utah

Form
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1. (d.)

3. Applicants Property Rights:

(a.) The property consists of 68 unpatented mining claims located in the central part of Big Indian Wash, San Juan County, Utah.

(b.) None

(c.) The properties were purchased from Dr. John A. Soelberg of Grand Junction, Colorado.

(e.) Dr. Soelberg holds a 12½% royalty interest in the properties.

(f.) See attached legal documents pertaining to the property transfer.

4. Physical Description

(a.) Surveying and geologic mapping are being conducted on the properties by geologists associated with the Pathfinder Corporation.

(b.) None

(c.) Please aee attached geologic report.

(d.) Access roads to the area are in excellent condition and are passable throughout the year. The Town of Moab, Utah, is the principal shipping and supply point.

(e.) Materials and supplies are available from well-stocked warehouses in the Moab district. Water for drilling can be obtained from several sources in the North Big Indian Wash area.

Power must be supplied by a diesel generator.

5. The Exploration Project

(a.) Uranium Ores

(b.) The projected program will consist of an exploration drilling program on widespaced centers.

At the present time 15 holes are planned for the drilling program. The holes are spaced on rather wide centers as can be seen from the attached map, and it is the intent of the Pathfinder Corporation to seek the assistance and advice of the U.S.G.S. and U.S.A.E.C. in planning the final locations of and the number of holes needed to explore the claims in question.

Total footage requested under this application should amount to approximately 17,000 feet of core and non-core type diamond drilling. (See attached map for proposed drill hole locations).

(c.) Work will commence immediately upon approval of the program by government officials.

(d.) Mr. Paul DeVergie, formerly with the Exploration division of the United States Atomic Energy Commission is now employed by the Pathfinder Corporation, and will in all probability be in charge of the program.

Pathfinder Uranium Corporation
904 Walker Bank Building
Salt Lake City, Utah

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6. Estimate of Costs

(a.) Several bids were solicited for the proposed drilling program, and the lowest bid was obtained from the Swank drilling Co., of Moab, Utah, with a bid of $3.25 per foot for both core and non-core to 1,200 feet.

17,000 ft. @ $3.25/ft.	$55,250.00

Probing of Holes

15 locations @ $40.00 15 logs @ $15.00 17,000 feet of probing @ $.04/ft.	1,595.00

(b.) Charges for geology and engineering. 500.00

(c-d-e-f) None.

(g.) Sampling and Assaying.

30 determinations for uranium and lime @ $5.00	150.00

(h.) None

GRAND TOTAL	$57,495.00

7. (a.) Pathfinder Uranium is prepared to furnish its share of the costs in accordance with existing DMEA regulations.

(b.) Pathfinder is prepared to furnish its share of the costs in cash.

PATHFINDER URANIUM CORPORATION

By Clark L. Wilson

Clark L. Wilson, Vice-President & General Manager

Dated 12/20/84

PREPARED AT THE REQUEST OF THE PATHFINDER URANIUM COMPANY

GEOLOGIC REPORT ON THE JOAN, ILENA AND LA PREAL GROUPS OF CLAIMS, BIG INDIAN WASH DISTRICT, SAN JUAN COUNTY UTAH.

T. 30 S., R. 24 E.

S L P M

By

RICHARD A. TEICHMAN JR

Consulting Geologist

Moab, Utah

October, 1954

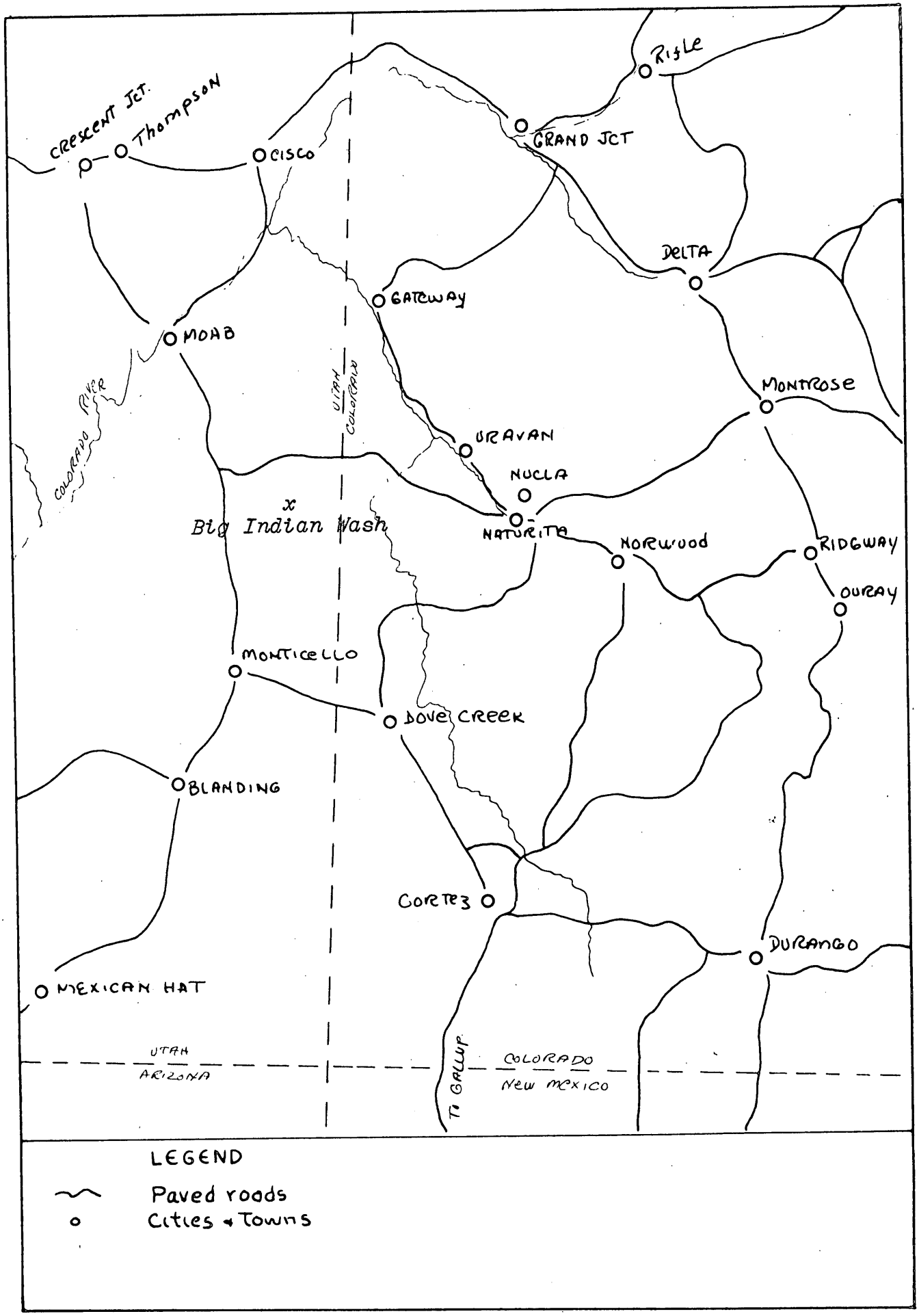

FIG.- INDEX MAP, COLORADO PLATEAU AREA

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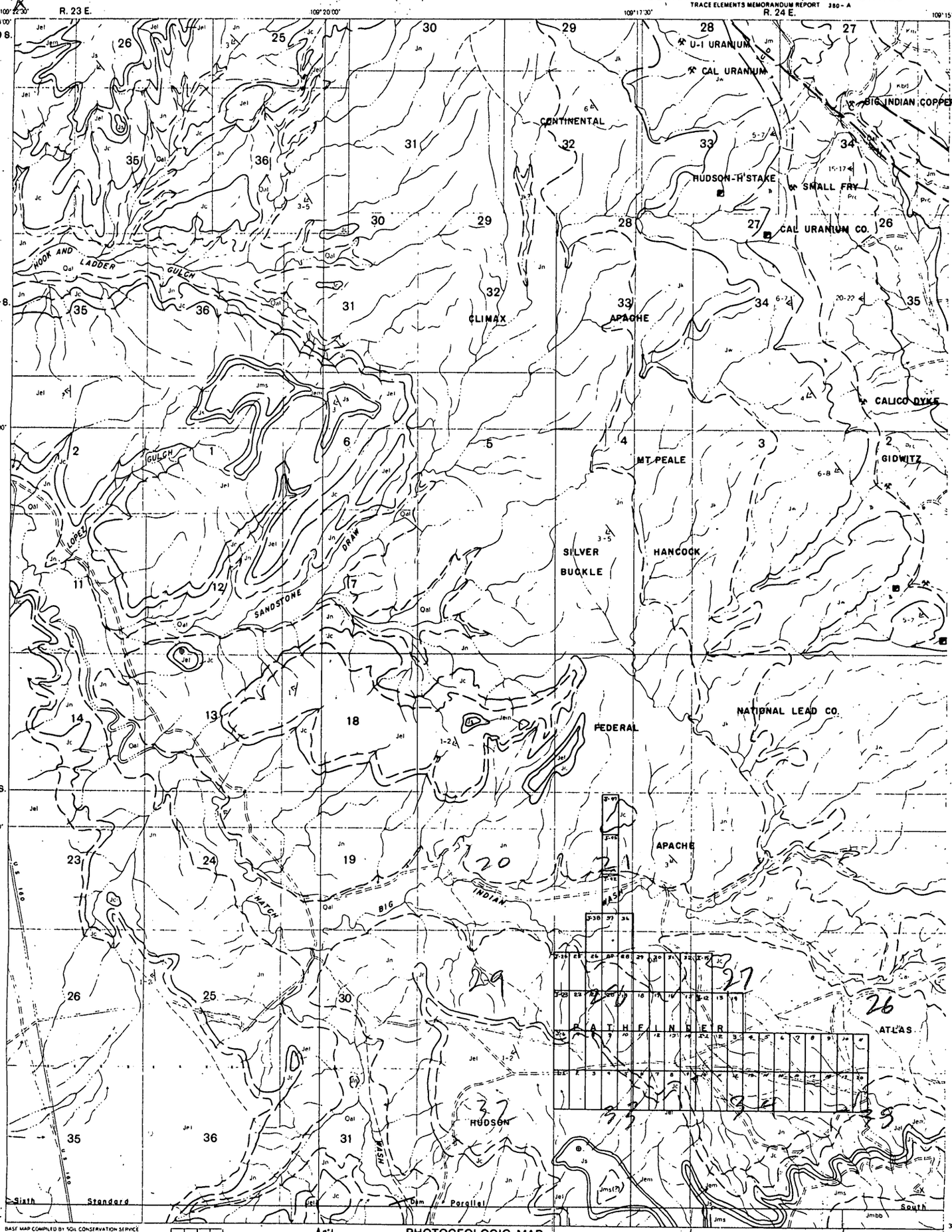
U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
ATOMIC ENERGY COMMISSION

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

TRACE ELEMENTS MEMORANDUM REPORT 380-A



EXPLANATION

QUATERNARY
- Qal — Alluvium (Valley fill and terrace gravel)

CRETACEOUS
- Km — Mancos shale
- KDC — Burro Canyon formation and Dakota sandstone, undifferentiated

JURASSIC
- Upper and Lower: Jm — Morrison formation; Brushy Basin shale member, Jmbb; Salt Wash sandstone member, Jms
- Upper: Js — Summerville formation
- Upper and Middle: Je — Entrada sandstone; Moab tongue, Jem; lower unit, Jel
- Jc — Carmel formation
- Jn — Navajo sandstone
- Jk — Kayenta formation
- Jw — Wingate sandstone

TRIASSIC
- Upper (?): Ꞧ — Triassic rocks undifferentiated

PERMIAN
- Pcr — Rico - Cutler formations undifferentiated

Contact (Can be accurately located within 30 feet horizontally)

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

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

Probable or doubtful contact

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

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

Horizontal beds

Mine or quarry

Prospect or open cut

Primary road

Secondary road

Trail

Fence

SHAFT
J = JOAN GROUP
L = LA PREAL GROUP
I = ILENA GROUP

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

MT. PEALE QUADRANGLE

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

PHOTOGEOLOGY BY R. J. HACKMAN AND G. E. TOLBERT

SCALE 1:24,000

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

REVISED OCTOBER 1952

MB-3.11-1

RICHARD A. TEICHMAN
Consulting Geologist
1244 E. Elm Ave.
Grand Junction, Colorado

Mine Examination

Property Evaluation

October, 1954

Mr. Clark L. Wilson
904 Walker Bank Bldg.
Salt Lake City, Utah

Dear Mr. Wilson:

The following is a report on the geology and the uranium possibilities of the Joan, La Preal and Ilena groups of claims located in the southern part of Big Indian Wash , San Juan County, Utah.

Pursuant to your instructions I have also included recommendations for further development of the properties.

Sincerely,

Richard A. Teichman Jr.

RICHARD A. TEICHMAN JR
Geologist

RT/rg

INTRODUCTION:

This report has been prepared at the request of Mr. Clark L. Wilson of Salt Lake City, Utah and is designed to assess the uranium possibilities of the Joan, La Preal and Ilena groups of claims located in the southern part of Big Indian Wash, San Juan County, Utah.

Approximately 10 square miles were covered during the course of the investigation during the early part of October, 1954.

Mr. Teichman holds a Masters degree in Geology from Boston University, Boston, Mass., From June 1, 1952 - May 1, 1954 he was employed by the United States Atomic Energy Commission as a geologist. From July 1, 1953 until May 1, 1954 he was assigned to the Big Indian Wash area as Supervising Geologist for the United States Atomic Energy Commission, and was in charge of reconnaissance, and drilling programs.

The claims under discussion are located in the southern part of Big Indian Wash about 6 miles east of US Highway 160.

Big Indian Wash begins 9 miles south of the town of La Sal, Utah, and extends south from that point for 5 miles. An escarpment parallels the work for approximately 4½ miles to the point where the wash turns west to drain into the Hatch Wash and thence into the Colorado River. This escarpment contains several mineralized outcrops in the Cutler

and Chinle formations.

The Big Indian Wash area is within T.'S. 29, 29½ and 30 S.and R.24 and 25 E.,Salt Lake Meridian. From Moab, Utah, it is reached by following U. S. Highway 160 South to La Sal Junction, thence over state road 46 for 7 miles, and then south for 7 miles on a gravel road to the first outcrop of Wingate sandstone. The gravel road continues through the wash for approximately 10 miles and joins U. S. Highway 160, 20 miles north of Monticello, Utah. The Gravelled road is passable throughout the year.

Ore from the area is being shipped either 38 miles to the AEC mill at Monticello, or 60 miles to the buying station at Thompson, Utah.

MINING HISTORY

Approximately 20 square miles of land has been claimed in the Big Indian district, and all school sections have been leased.

The majority of the above noted claims have been filed after January 1, 1953 and are consequently in conflict with existing oil and gas leases.

The following individuals and organizations have filed claims in the Big Indian Wash district.

they would spell it this way"

1. Utex Exploriation Company
2. The Homestake Mining Company
3. The Cal Uranium Company
4. The Continential Uranium Company

5. Roberts Construction Co.

6. National Lead Co.

7. Federal Uranium Co.

8. Standard Uranium Co.

9. Lisbon Uranium Co.

10. Apache Uranium Co.

11. Jolly Jack Uranium Co.

12. Robert B. Daniel, Grand Junction, Colo.

13. Frazier & Provonsha, Monticello, Utah
14. Nielsen and Larsen, Grand Junction, Colo.

15. Robert Barrett, Moab, Utah

PAST AND PRESENT MINING ACTIVITY

Three large mines are active in the Big Indian Wash area at the present time (Fig. 2). These are:

1. The Cal Uranium Company's San Juan shaft
   (½ mile SE of the Hudson-Homestake property)
2. The Utex Exploration Company's MiVida Mine
   (C. Steen)
   (In the central part of the wash)
3. The Continental Uranium Co's School Section 36 mine.
   (8 miles SW of the Steen Mine)

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

1. The Homestake-Little Beaver property
   (driving a 330 foot adit)

2. The Homestake property (sinking a 500 foot shaft) (Immediately south of the Steen mine)

3. The Standart Uranium Co. property (driving a 600 foot adit east of the Steen mine.

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

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

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

The Cal Uranium Company of Moab, Utah, has sunk a two-compartment 'cribbed' shaft into an ore body ½ mile south east of the Columbia No. 1 claim. Development work has been completed and ore is being shipped on a regular schedule.

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

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

GEOMORPHOLOGY AND CLIMATE

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

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

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

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

Vegetation consists of sage, cactus, and small pinon and Juniper trees.

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

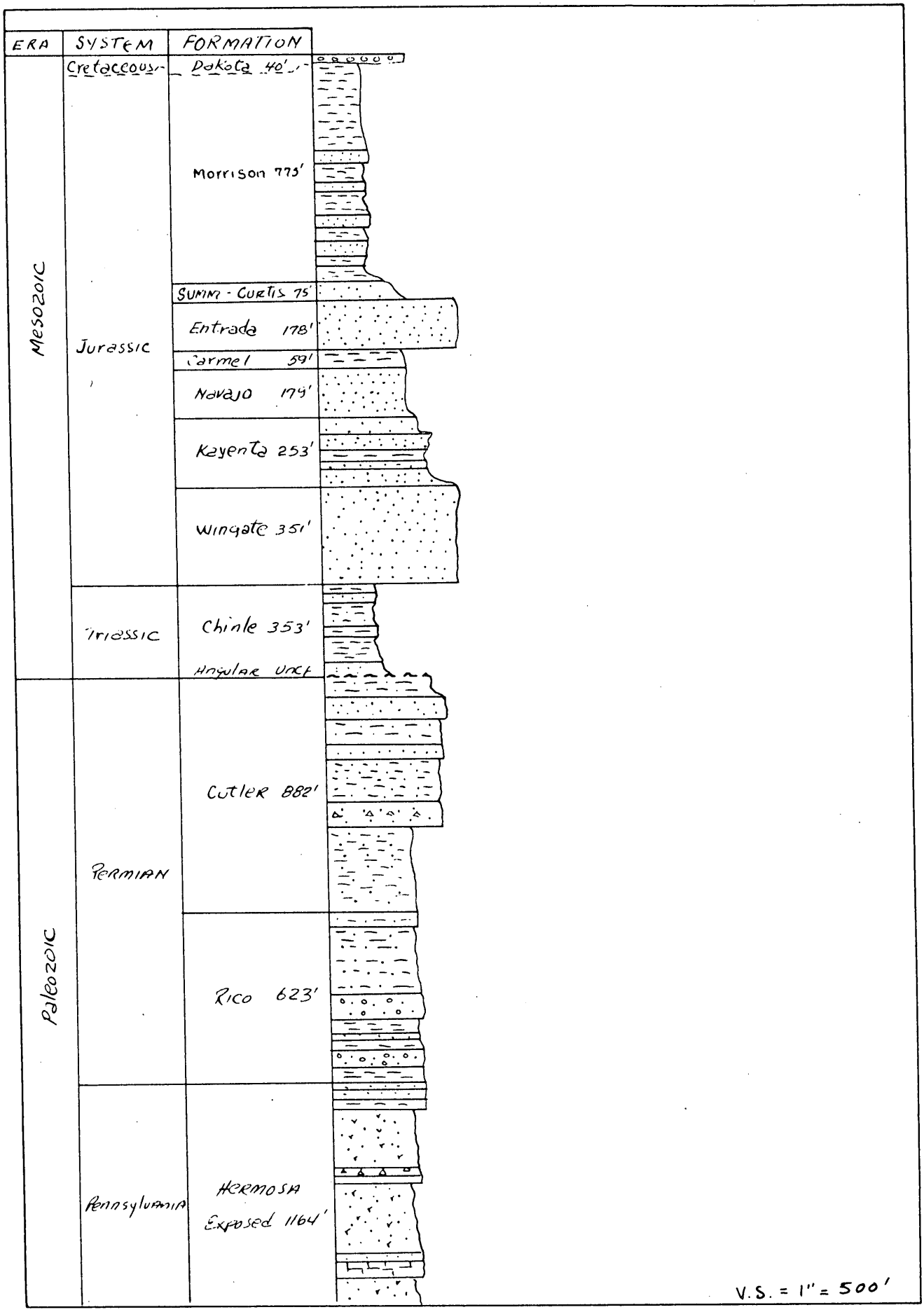


FIG.- STRATIGRAPHIC SECTION, SOUTH BIG INDIAN WASH and Lisbon Valley, San Juan County, UTAH.

GEOLOGY

Previous reports on the Big Indian Wash Mining district are:

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

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

2. The Uranium Deposits of Big Indian Wash, January, 1953, by George P. Dix, Jr. This report recommended an investigation drilling program in the Big Indian Wash District.

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

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

4. Geology and Ore Deposits of the Big Indian Wash District, by Teichman, R; McLelland, J; and Fisk, I; USAEC, 1954. (Unpublished-classified)

   This report describes in detail the geology and the ore deposits of the Big Indian Wash District.

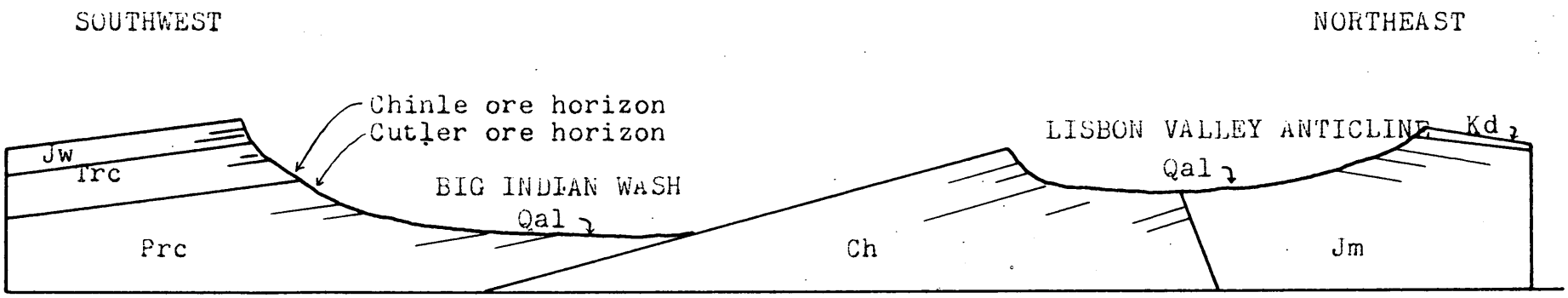
The rock formations exposed in theBig Indian Wash district range in age from Pennsylvanian Hermosa limestone to the Jurrasic Navajo sandstone. The principal Uranium bearing horizon is a sandstone member in the lower part of the Triassic Chinle formation which has been tentatively identified as the Mossback member of the Chinle formation. The formations overlying the ore horizon within the claim boundaries are the Wingate, Chinle, and Mossback member of Chinle. The formation underlying the ore horizon is the Cutler-Rico and the contact is an angular unconformity with the Moenkopi being eroded out. A brief discription of these formations is:

Navajo Sandstone - 150' - orange to red to buff sandstone; fine grained; crossbedded.

Kayenta Formation - 125'- red to brown shales and silts; some crossbedding; contains some carbon.

Wingate 315' Light reddish brown, fine-grained, hard, friable, tight to slightly porous sandstone; and some white fine-grained calcareous sandstone and limestone nodules; cross-bedded in some horizons.

Chinle 415' Purple, maroon, red, brown, and green mottled sandy shale; reddish-brown to pink grey and grey-green, fine-grained, tight, calcareous arkosic sandstone; grey



Qal	Alluvium
Kd	Dakota
Jm	Morrison
Jw	Wingate
Trc	Chinle Fm
Prc	Rico-Cutler Fm
Ch	Hermosa Limestone

Horizontal Scale

0 1/4 1/2 3/4 1

Miles

FIGURE - - GEOLOGIC CROSS SECTION: LISBON VALLEY ANTICLINE IN THE VICINITY OF UTEX AND BIG BUCK MINES, BIG INDIAN WASH, SAN JUAN COUNTY, UTAH.

and grey-green granules to pebble conglomerates of mudstone, siltstone and limestone tight lime cemented conglomerate; some arkose sandstone, (Mossback).

Cutler 900' White to pink to reddish-brown, fine to medium grained, tight to porous, micaceous, arkosic and calcareous sandstone; some variagated shale and some chert, limestone, and gypsum.

TECTONIC STRUCTURES

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

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

A pronounced joint system is present in the Big Indian Wash district and aerial photographs indicate that in the northern part of the district,

where private development is currently centered, the joints strike northwest. In two places, as seen from aerial photographs, closely spaced conjugate joint sets exist. These two areas are in the vicinity of Steen's canyon and the canyon immediately north of Steen Canyon. This well-developed conjugate joint set doubtless influenced the canyon development.

ECONOMIC GEOLOGY

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

CHINLE DEPOSITS

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

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

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

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

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

Paragenesis shows this depositional order: detritals, authigenic quartz, cement and lastly ore minerals.

minerals. The cement is made up of several materials: calcite, clay barite and chlorite. Their times of deposition are possibly simultaneous. One thin section from the Continental Uranium Company deposit is of interest. It shows a pyrite band deposited before the ore minerals on the contact of the fine and coarse textrued material, and it has incompletely replaced all detritals and matrix except zircon. Detrital quartz is abundant in all thin sections except those of the limestone conglomerates. These conglomerates are granule to pebble in size and the presence of quartz-feldspar lenses shows the interbraiding of different source material within the lower Chinle (Mossback.) The quartz grains show corrosion by earlier solutions than the cement. Calcite is the most abundant cementing material and it replaces feldspars; it in turn is replaced by later ore minerals. On the basis of paragenesis and ore minerals it can be said that the Mossback deposits in this area are similar. There are some small differences, however, these are more silica cement, lack of barite and the lask of tyuyamunite in the Continental Uranium Company deposit in the southern part of the wash. These differences may be small on the basis of further core study.

ORE DEPOSITS

In the discussion of the deposits in the Big Indian Wash area only those deposits in or nearing the production stages will be considered. At present five large deposits have been located by diamond drilling and are being actively exploited. They are : (see map)

1. The Steen discovery in the central part of the Wash. Approximately 3,500 feet long and 1,500 feet wide.
2. The Cal Uranium - Mamie deposit in the northern part of the wash. Approximately 2,500 feet long and 1,500 feet wide.
3. The Hudson discovery in the northern part of the wash. Approximately 300 feet long, 150 feet wide and not yet completely developed.
4. The Homestake (Little Beaver) property immediately southwest of the Steen deposit and probably contiguous.
5. The Continental Uranium Company deposit in the extreme southern part of the wash. Approximately 800 feet long and 300 feet wide.

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

It is to be noted that the strike of the other deposits within the wash vary radically from one to the other, and it appears that at this time a combination of

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

$$\text{PROBABILITY} = \frac{\text{Target Size x size of ore bodies}}{\text{area of elementary figure (spacing)}}$$

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

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions have been reached during the course of the reconnaissance investigation of the Joan, La Preal and ~~Ilean~~ Ilena claims:

1. The Joan, La Preal and Ilena groups of claims appear to favorably located with respect to known deposits in the Big Indian Wash area. No

mines are operative near the property, but mineralization has been observed on outcrops east of the claims. (See attached maps).

2. No criteria have yet been developed for the Big Indian Wash area which would allow of prediction of ore trends into the area covered by the claims. However, considering the possibility of extension of the mineralization noted on the outcrops east of the properties the following is recommended:

1. It is recommended that a limited exploratory drilling program be conducted upon the property. (Limited considering the drilling depths required to penetrate the ore horizon).

   a. The drilling program should be completed in stages; the first stage to consist of about 15 holes on 2,000 foot centers to an average depth of 1,200 feet.

   b. Should favorable results be encountered during the first drilling stage it is recommended that stage 2 be undertaken. Stage 2 should consist of a program devised to decrease the hole spacing to 500 and 1,000 foot centers in those areas considered favorable. Fifteen to twenty holes will be needed in this stage; drilling depths will average 1,200 feet.

No detailed drilling has been done in the area surrounding the La Preal, Ilena and Joan groups, but some

wildcat drilling has been done by the National Uranium Company on its lease properties a few miles north of the properties. The National Lead Company has done some drilling, but the results are not available at the present time.

The Roberts construction Company has for some time contemplated a drilling program on its property east of the claims under discussion, but up to the present time no drilling has taken place.

Due to the depth of hole in the area under discussion no outline has been prepared for drilling beyond stage 2 since it is felt that t his would be quite premature. Evaluation of the results of the first two drilling stages will provide the information necessary for further planning.

A G R E E M E N T

THIS AGREEMENT, Made and entered into this 26th day of April, 1954, between JOHN A. SOELBERG and JOAN M. SOELBERG, his wife, both of Mesa County, Colorado, "First Parties", and JACK D. GAY, of Shoshone County, Idaho, "Second Party";

W I T N E S S E T H:

That first parties, for and in consideration of the sum of TEN ($10.00) DOLLARS, to them this day in hand paid by the second party, receipt of which is hereby expressly acknowledged, and in further consideration of the promises and covenants of second party herein contained and agreed, do hereby agree to sell, transfer and convey unto second party, or his assigns, the following described mining claims located in an unorganized mining district in Townships 29 South and 30 South, Range 25 East, Salt Lake Meridian, San Juan County, State of Utah, all as more fully described in the Location Certificates which were recorded in the office of the Clerk and Recorder of San Juan County, Utah, as follows:

Name of Claim	Description Sec.	Twp.	Rg.	Date of Location	County Clerk and Recorder's Book and Page Book	Page
Lucky Dog # 1	SW$\frac{1}{4}$	33	29S	25E	1/7/54	55	202
" " # 2	"	"	"	"	"	"	203
" " # 3	"	"	"	"	"	"	203
" " # 4	"	"	"	"	"	"	204
" " # 5	S$\frac{1}{2}$	"	"	"	"	"	204
" " # 6	SE$\frac{1}{4}$	"	"	"	"	"	205
" " # 7	"	"	"	"	"	"	205
" " # 8	"	"	"	"	"	"	206
" " # 9	SE$\frac{1}{4}$,33,SW$\frac{1}{4}$	34	"	"	"	"	206
" " #10	W$\frac{1}{2}$	33	"	"	"	"	207
" " #11	"	"	"	"	"	"	207
" " #12	"	"	"	"	"	"	208
" " #13	E$\frac{1}{2}$ W$\frac{1}{2}$	"	"	"	"	"	208
" " #14	Center of	"	"	"	"	"	209
" " #15	W$\frac{1}{2}$ E$\frac{1}{2}$	"	"	"	"	"	209
" " #16	E$\frac{1}{2}$	"	"	"	"	"	210
" " #17	"	"	"	"	"	"	210
" " #18	E$\frac{1}{2}$, 33, W$\frac{1}{2}$	34	"	"	"	"	211
" " #19	NW$\frac{1}{4}$	33	"	"	"	"	211
" " #20	"	"	"	"	"	"	212
" " #21	"	"	"	"	"	"	212

(Incorrectly described as being in Range 24 E)

Name of Claim			Description Sec.	Twp.	Rg.	Date of Location	County Clerk and Recorder's Book and Page Book	Page
Lucky Dog		#22	NW¼	33	29S	25E	1/7/54	55	213
"	"	#23	N½	"	"	"	"	"	213
"	"	#24	NE¼	"	"	"	"	"	214
"	"	#25	"	"	"	"	"	"	214
"	"	#26	"	"	"	"	"	"	215
"	"	#27	"	"	"	"	"	"	215
Red Dog		# 1	NE¼	3	30S	"	11/1/53	39	351
"	"	# 2	"	"	"	"	"	"	352
"	"	# 3	"	"	"	"	"	"	352
"	"	# 4	"	"	"	"	"	"	353
"	"	# 5	N½	"	"	"	"	"	353
"	"	# 6	"	"	"	"	"	"	354
"	"	# 7	"	"	"	"	"	"	354
"	"	# 8	NW¼	"	"	"	"	"	355
"	"	# 9	NW¼ 3, NE¼	4	"	"	"	"	355
"	"	#10	NE¼	"	"	"	"	"	356
"	"	#11	"	"	"	"	"	"	356
"	"	#12	"	"	"	"	"	"	357
"	"	#13	N½	"	"	"	"	"	357
"	"	#14	"	"	"	"	"	"	358
"	"	#15	NW¼	"	"	"	"	"	358
"	"	#16	"	"	"	"	"	"	359
"	"	#17	"	"	"	"	"	"	359
"	"	#18	NW¼ 4, NE¼	5	"	"	"	"	360
"	"	#19	" " "	"	"	"	"	"	360
"	"	#20	NW¼	4	"	"	"	"	361
"	"	#21	"	"	"	"	"	"	361
"	"	#22	"	"	"	"	"	"	362
"	"	#23	N½	"	"	"	"	"	362
"	"	#24	NE¼	"	"	"	"	"	363
"	"	#25	"	"	"	"	"	"	363
"	"	#26	"	"	"	"	"	"	364
"	"	#27	"	"	"	"	"	"	364
"	"	#28	NW¼ 4, NE¼	5	"	"	"	"	365
"	"	#29	NW¼	3	"	"	"	"	365
"	"	#30	"	"	"	"	"	"	366
"	"	#31	"	"	"	"	"	"	366
"	"	#32	N½	"	"	"	"	"	367
"	"	#33	NE¼	"	"	"	"	"	367
			(Incorrectly described as being in Range 25 West)						
"	"	#34	NE¼	3	30S	25E	11/1/53	39	368
"	"	#35	"	"	"	"	"	"	368
"	"	#36	"	"	"	"	"	"	369
"	"	#37	E½ E½	"	"	"	"	"	369
"	"	#38	E½	"	"	"	"	"	370
"	"	#39	"	"	"	"	"	"	370
"	"	#40	"	"	"	"	"	"	371
"	"	#41	Center of	"	"	"	"	"	371
"	"	#42	W of Center of	"	"	"	"	"	372
"	"	#43	W½	"	"	"	"	"	372
"	"	#44	"	"	"	"	"	"	373
"	"	#45	W½ 3, E½	4	"	"	"	"	373
"	"	#46	E½	"	"	"	"	"	374
"	"	#47	"	"	"	"	"	"	374
"	"	#48	"	"	"	"	"	"	375
"	"	#49	Center of	"	"	"	"	"	375
"	"	#50	"	"	"	"	"	"	376
"	"	#51	W of "	"	"	"	"	"	376
			(Incorrectly described as being in Range 25 West)						

Name of Claim		Description Sec.	Twp.	Rge.	Date of Location	County Clerk and Recorder's Book and Page Book	Page
Red Dog # 52	W½	4	30S	25E	11/1/53	39	377
" " # 53	"	"	"	"	"	"	377
" " # 54	W½ W½	4)					
	E½ E½	5)	"	"	"	"	378
" " # 55	W½ W½	4)					
	E½ E½	5)	"	"	"	"	378
" " # 56	W½	4	"	"	"	"	379
" " # 57	"	"	"	"	"	"	379
" " # 58	E½ W½	"	"	"	"	"	380
" " # 59	Center of	"	"	"	"	"	380
" " # 60	E½	"	"	"	"	"	381
" " # 61	"	"	"	"	"	"	381
" " # 62	"	"	"	"	"	"	382
" " # 63	"	"	"	"	"	"	382
" " # 64	W½ 3, E¼	"	"	"	"	"	383
" " # 65	SW¼	3	"	"	"	"	383
" " # 66	"	"	"	"	"	"	384
" " # 67	S of Center of	"	"	"	"	"	384
" " # 68	S½	"	"	"	"	"	385
" " # 69	SE¼	"	"	"	"	"	385
" " # 70	"	"	"	"	"	"	386
" " # 71	"	"	"	"	"	"	386
" " # 72	"	"	"	"	"	"	387
Cleo # 1	NE¼	31	29S	"	10/31/53	"	388
" # 2	"	"	"	"	"	"	389
" # 3	"	"	"	"	"	"	390
" # 4	"	"	"	"	"	"	391
" # 5	N½	"	"	"	"	"	392
" # 5A	"	"	"	"	2/7/54	65	206
" # 6	NW¼	"	"	"	10/31/53	39	393
" # 6A	N½	"	"	"	2/7/54	65	206
" # 7	NW¼	"	"	"	10/31/53	39	394
" # 8	W½	"	"	"	"	"	395
" # 9	"	"	"	"	"	"	396
" #10	"	"	"	"	"	"	397
" #11	"	"	"	"	"	"	398
" #12	Center of	"	"	"	"	"	399
" #13	E½	"	"	"	"	"	400
" #14	"	"	"	"	"	"	401
" #15	"	"	"	"	"	"	402
" #16	"	"	"	"	"	"	403
" #17	SE¼	"	"	"	"	"	404
" #18	"	"	"	"	"	"	405
" #19	"	"	"	"	"	"	406
" #20	"	"	"	"	"	"	407
" #21	S½	"	"	"	"	"	408
" #22	SW¼	"	"	"	"	"	409
" #23	"	"	"	"	"	"	410
" #24	"	"	"	"	"	"	411
" #25	"	"	"	"	"	"	412
" #26	SW¼	31	29S	25E)			
	N½	6	30S	25E)	"	"	413
" #27	SW¼	31	29S	25E)			
	N½	6	30S	25E)	"	"	414
" #28	SW¼	31	29S	25E)			
	NE¼	6	30S	25E)	"	"	415
" #29	S½	31	29S	25E)			
	NW¼	5	30S	25E)	"	"	416

Name of Claim	Description	Sec.	Twp.	Rg.	Date of Location	County Clerk and Recorder's Book and Page: Book	Page
Cleo #30	S½	31	29S	25E)			
	N½	5	30S	25E)	10/31/53	39	417
Cleo #31	S½	31	29S	25E)			
	N½	5	30S	25E)	"	"	418
" #32	SE¼	31	29S	25E)			
	NW¼	5	30S	25E)	"	"	419
" #33	SE¼	31	29S	25E)			
	N½ N½	5	30S	25E)	"	"	420
" #34	SE¼ SE¼	31	29S	25E)			
	N½ N½	5	30S	25E)	"	"	421
" #35	NE¼	5	"	"	1/7/54	55	199
" #36	NE¼ NE¼	"	"	"	"	"	200
" #37	" "	"	"	"	"	"	200
" #38	NE¼	"	"	"	"	"	201
" #39	"	"	"	"	"	"	201
" #40	"	"	"	"	"	"	202
Pink Dog # 1	N½	"	"	"	1/8/54	"	197
" " # 2	"	"	"	"	"	"	197
" " # 3	"	"	"	"	"	"	198
" " # 4	"	"	"	"	"	"	198
" " # 5	Near Center of	"	"	"	"	"	199
" " # 6		"	"	"	1/20/54	59	216
" " # 7		"	"	"	"	"	216
" " # 8		"	"	"	"	"	217
" " # 9		"	"	"	"	"	217
" " #10			"	"	"	"	218
" " #11		5	"	"	"	"	218
" " #12		"	"	"	"	"	219
" " #13		"	"	"	"	"	219
" " #14		"	"	"	"	"	220
Ilena # 1	SW¼	27	"	24E	10/14/53	37	124
" # 2	"	"	"	"	"	"	125
" # 3	"	"	"	"	"	"	126
" # 4	"	"	"	"	"	"	127
" # 5	N½	"	"	"	"	"	128
" # 6	SE¼	"	"	"	"	"	129
" # 7	"	"	"	"	"	"	130
" # 8	"	"	"	"	"	"	131
" # 9	SE¼ 27, SW¼	26	"	"	"	"	132
" #10	SW¼	"	"	"	"	"	133
" #11	"	"	"	"	"	"	134
" #12	W½	27	"	"	10/18/53	"	193
" #13	"	"	"	"	"	"	194
" #14	"	"	"	"	"	"	194
" #15	NW¼	"	"	"	"	"	195
Joan # 6		28	"	"	10/14/53	"	104
" # 7		"	"	"	"	"	105
" # 8		"	"	"	"	"	106
" # 9		"	"	"	"	"	107
" #10		"	"	"	"	"	108
" #11		"	"	"	"	"	109
" #12		"	"	"	"	"	110
" #13		"	"	"	"	"	111
" #14	27 &	28	"	"	"	"	112
" #15	E½ 28, W½	27	"	"	10/18/53	"	190
" #16	E½	28	"	"	"	"	190
" #17	"	"	"	"	"	"	191
" #18		"	"	"	10/14/53	"	113
" #19		"	"	"	"	"	114
" #20		"	"	"	"	"	115

Name of Claim		Description Sec.	Twp.	Rg.	Date of Location	County Clerk and Recorder's Book and Page Book	Page
Joan #21	W½	28	30S	24E	10/14/53	37	116
" #22	"	"	"	"	"	"	117
" #23	"	"	"	"	"	"	118
" #24		"	"	"	"	"	119
" #25		"	"	"	"	"	120
" #26		"	"	"	"	"	121
" #27		"	"	"	"	"	122
" #28		"	"	"	"	"	123
" #29	NE¼	"	"	"	10/18/53	"	191
" #30	"	"	"	"	"	"	192
" #31	"	"	"	"	"	"	192
" #32	NE¼ 28, NW¼	27	"	"	"	"	193
" #37	21 &	28	"	"	"	"	294
" #42	S½	21	"	"	"	"	294
" #45	Near Center of	"	"	"	" "	"	295
" #47	N½	"	"	"	"	"	295
LaPreal # 1			"	"	10/14/53	"	136
" " # 2	NW¼	33	"	"	"	"	137
" " # 3	"	"	"	"	"	"	138
" " # 4	N½	"	"	"	"	"	139
" "	"	"	"	"	"	"	135
" " # 6	"	"	"	"	"	"	140
" " # 7	NE¼	"	"	"	"	"	141
" " # 8	"	"	"	"	"	"	142
" " # 9	NW¼ 34, NE¼	"	"	"	"	"	143
" " #10	NW¼	34	"	"	"	"	144
" " #11	"	"	"	"	"	"	145
" " #12	"	"	"	"	"	"	146
" " #13	"	"	"	"	"	"	147
" " #14	N½	"	"	"	"	"	148
" " #15	NE¼	"	"	"	"	"	149
" " #16	"	"	"	"	"	"	150
" " #17	"	"	"	"	"	"	151
" " #18	NW¼ 35, NE¼	"	"	"	"	"	152
" " #19	NW¼	35	"	"	"	"	153
" " #20	"	"	"	"	"	"	154

Said mining claims shall be conveyed by good and sufficient Special Warranty Deed, free from encumbrances, which said deed shall be executed and delivered to second party upon the execution and acknowledgment of this agreement. From and after the execution of this agreement second party shall have full right to apply to AEC under Circular 7 for a lease or leases of said claims in his own name or in the names of first parties, or in the name of second party's assignees, and first parties shall fully cooperate with second party in making such application.

In consideration of the giving of this agreement and in further consideration of the mutual covenants and promises herein contained, it is hereby agreed:

1. FIRST PARTIES AGREE:

A. That they will forthwith proceed to relocate, restake, recorner and refile where necessary, all of said claims at their own expense. (At the completion of said corrective work on said claims first parties will furnish second party with an itemized statement of all expenses incurred by first parties in said respects.)

B. To act as second party's agent in making application to AEC for lease of said claims in second party's name (or in the names of first parties or in the name of second party's assignee at second party's option).

2. SECOND PARTY AGREES:

A. Within sixty days from date of this agreement to organize a corporation with an authorized capitalization of at least $200,000.00 for the purpose of financing the exploration of said mining claims, and to assign and convey said mining claims to said company and assign second party's rights and obligations under this contract to said company.

B. Within eighteen months from date said new company shall obtain at least $60,000.00 for the exclusive purpose of financing the operations, salaries and expenses of two geologists in prospecting and locating further mining claims for the period of at least two years. Said geologists, in addition to their salaries, shall receive 5% of net profits realized by said company on ores coming from properties located by them, and first parties shall receive 2% of net mill returns from ores coming from said properties. "Net mill returns" shall be construed as per the definition included hereinafter in subparagraph 2F hereof. "Net profits" so to be paid to said geologists shall be defined as including all actual profits arising from the sale of said ores, less all actual costs of operation, including depreciation, salaries and other normal costs of operation, but not including

income taxes or depletion allowances. Upon failure of second party or his assignee to thus provide and expend the minimum sum of $60,000.00 in such exploration, the title to the claims conveyed by first parties to second party shall revert to first parties and second party, or his assignee, shall, upon demand by first parties, make prompt reconveyance thereof by good and sufficient Special Warranty Deed.

C. To pay Court House filing and true copy fees and $10.00 per claim application fees with AEC incident to filing application for lease with AEC on the claims herein optioned by first parties to second party.

D. Pay all costs of survey by second party's independent surveyor if second party elects to have an independent survey of claims made, PROVIDED THAT in the event such an independent survey is conducted by second party, first parties shall render all possible assistance in regard thereto without charge.

E. In the event that exploration of the claims herein conveyed by first parties to second party or any of said claims, is deemed advisable by geologists and consultants of the company so to be organized by second party, then said company shall file and process an application to DMEA for a 75%-25% participation loan on said claims, and thereafter if said application is granted the company shall expend such amounts as may be available and may be practicable in development of said claims. (In respect to said application for loan first parties shall lend every necessary and possible assistance to the company, and shall, if necessary, agree that repayment royalties to DMEA shall take precedence over the royalties hereinafter provided to be paid first parties and/or that the royalties hereinafter provided for first parties be reduced so as to satisfy requirements set forth by DMEA or AEC.) In the event a DMEA loan is granted and if first parties elect to secure the services of an

independent geologist to review the work done in such development of claims by said company, then the company shall reimburse first parties for not more than $500.00 per year of actual salaries paid by first parties to such geologist.

F. To pay first parties as a royalty for production from claims herein conveyed by first parties to second party, 12½% of the net mill returns of all ores mined from said claims by second party, such payment to be made by delivery of such ore with all convenient speed in lots as mined to some mill or regular ore buyer, and leaving with such mill or ore buyer, the percentage of mill returns aforesaid for delivery to first parties. For the purposes of this contract "net mill returns" shall mean such sums as shall be paid for the values in the ore after deducting all charges for carriage in any form, assays and mill charges. Should the uranium oxide content of ore mined and the volume thereof be sufficient to qualify for a bonus from the Government, first parties shall be entitled to receive 12½% as their share of such bonus. Development allowances and transportation allowances as set forth by the Government for the development and transportation of uranium are to be retained by second party or his assignee as their sole property. When transportation allowances, as set forth by the Government, are awarded on uranium ore, such sums shall be deducted from the total carriage charges to arrive at an adjusted carriage charge to be used in calculating the net mill returns of uranium ore.

G. To do and perform all necessary work on said claims in order to preserve an AEC lease thereon or assessment work necessary under State and Federal mining laws, and to pay all taxes levied or assessed on said claims and in connection with the development thereof and removal of ore therefrom, whether such taxes be property, occupation or other taxes; PROVIDED THAT this shall not apply to any income taxes payable by first parties on royalties or income received by them from said mineral claims, or from ores mined and removed therefrom.

H. To allow first parties and their agents from time to time to enter upon and into all parts of mining operations upon said claims for purposes of inspection, and to allow first parties to examine all drill logs, analysis and other pertinent data with regard to the development and operation of said claims, and to provide first parties with copies of any such data specifically requested by first parties.

I. There shall be reserved unto the second party and his assignee, however, the right to quit and abandon the claims herein conveyed or the claims so to be located by said geologists at any time if, in the opinion of second party's assignee, said claims are not susceptible of profitable operation, PROVIDED THAT in the event of such abandonment conveyance of said claims thus abandoned shall be offered to first parties or their assignees by good and sufficient Special Warranty Deed.

THE PARTIES DO HEREBY MUTUALLY AGREE That as to any additional mining claims or fractional mining claims located or acquired by lease from AEC by first parties or by second party, or his assignee, within Townships 29S and 30S, Range 25E, Salt Lake Meridian, San Juan County, State of Utah, within the effective term of this agreement (but not including mining claims purchased or otherwise acquired by second party from third parties) the same shall be included with the mining claims hereby conveyed by first parties to second party as part of the subject matter of this contract and subject to all the terms hereof, including the payment of a 12½% royalty to first parties as per the terms of paragraph 2F hereof.

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

_____

_____
First Parties

_____
Second Party

STATE OF COLORADO)
: SS.
COUNTY OF MESA)

Acknowledged before me this _____day of April, 1954, by JOHN A. SOELBERG and JOAN M. SOELBERG, his wife, both of Mesa County, Colorado, and by JACK D. GAY of Shoshone County, Idaho.

_____
Notary Public

My commission expires:

SPECIAL WARRANTY DEED:

THIS DEED, made this 13th day of July, 1954, between JACK D. GAY and VIOLA E. GAY, his wife, of the County of Shoshone, State of Idaho, parties of the first part and PATHFINDER URANIUM CORPORATION, a Utah corporation, with its principal office at 901 Walker Bank Building, Salt Lake City, Utah, party of the second part;

W I T N E S S E T H :

That the said parties of the first part, for and in consideration of the sum of Ten Dollars ($10.00) and other valuable consideration, to the parties of the first part in hand paid by the said party of the second part, receipt whereof is hereby confessed and acknowledged, have granted, bargained, sold and conveyed, and by these presents do grant, bargain, sell, convey and confirm unto the said party of the second part, its successors and assigns forever, all the following described mining claims situate, lying and being in the County of San Juan, State of Utah;

Name of Claim			Description Sec.	Description Twp.	Description Rg.	Date of Location	County Clerk and Recorder's Book and Page Book	County Clerk and Recorder's Book and Page Page
Lucky Dog	# 1	SW$\frac{1}{4}$	33	29S	25E	1/7/54	55	202
" "	# 2	"	"	"	"	"	"	203
" "	# 3	"	"	"	"	"	"	203
" "	# 4	"	"	"	"	"	"	204
" "	# 5	S$\frac{1}{2}$	"	"	"	"	"	204
" "	# 6	SE$\frac{1}{4}$	"	"	"	"	"	205
" "	# 7	"	"	"	"	"	"	205
" "	# 8	"	"	"	"	"	"	206
" "	# 9	SE$\frac{1}{4}$ 33, SW$\frac{1}{4}$	34	"	"	"	"	206
" "	#10	W$\frac{1}{2}$	33	"	"	"	"	207
" "	#11	"	"	"	"	"	"	207
" "	#12	"	"	"	"	"	"	208
" "	#13	E$\frac{1}{2}$ W$\frac{1}{2}$	"	"	"	"	"	208
" "	#14	Center of	"	"	"	"	"	209
" "	#15	W$\frac{1}{2}$ E$\frac{1}{2}$	"	"	"	"	"	209
" "	#16	E$\frac{1}{2}$	"	"	"	"	"	210
" "	#17	"	"	"	"	"	"	210
" "	#18	E$\frac{1}{2}$ 33, W$\frac{1}{2}$	34	"	"	"	"	211
" "	#19	NW$\frac{1}{4}$	33	"	"	"	"	211
" "	#20	"	"	"	"	"	"	212
" "	#21	"	"	"	"	"	"	212
		(Incorrectly described as being in Range 24E)						
" "	#22	NW$\frac{1}{4}$	33	29S	25E	1/7/54	"	213
" "	#23	N$\frac{1}{2}$	"	"	"	"	"	213
" "	#24	NE$\frac{1}{4}$	"	"	"	"	"	214
" "	#25	"	"	"	"	"	"	214
" "	#26	"	"	"	"	"	"	215
" "	#27	"	"	"	"	"	"	215

Name of Claim	Description Sec.	Twp.	Rg.	Date of Location	County Clerk and Recorder's Book and Page Book	Page
Red Dog # 1 NE$\frac{1}{4}$	3	30S	25E	11/1/53	39	351
" " # 2 "	"	"	"	" "	"	352
" " # 3 "	"	"	"	"	"	352
" " # 4 "	"	"	"	"	"	353
" " # 5 N$\frac{1}{2}$	"	"	"	"	"	353
" " # 6 "	"	"	"	"	"	354
" " # 7 "	"	"	"	"	"	354
" " # 8 NW$\frac{1}{4}$	"	"	"	"	"	355
" " # 9 NW$\frac{1}{4}$ 3, NE$\frac{1}{4}$	4	"	"	"	"	355
" " #10 NE$\frac{1}{4}$	"	"	"	"	"	356
" " #11 "	"	"	"	"	"	356
" " #12 "	"	"	"	"	"	357
" " #13 N$\frac{1}{2}$	"	"	"	"	"	357
" " #14 "	"	"	"	"	"	358
" " #15 NW$\frac{1}{4}$	"	"	"	"	"	358
" " #16 "	"	"	"	"	"	359
" " #17 "	"	"	"	"	"	359
" " #18 NW$\frac{1}{4}$ 4, NE$\frac{1}{4}$	5	"	"	"	"	360
" " #19 " " "	"	"	"	"	"	360
" " #20 NW$\frac{1}{4}$	4	"	"	"	"	361
" " #21 "	"	"	"	"	"	361
" " #22 "	"	"	"	"	"	362
" " #23 N$\frac{1}{2}$	"	"	"	"	"	362
" " #24 NE$\frac{1}{4}$	"	"	"	"	"	363
" " #25 "	"	"	"	"	"	363
" " #26 "	"	"	"	"	"	364
" " #27 "	"	"	"	"	"	364
" " #28 NW$\frac{1}{4}$ 4,NE$\frac{1}{4}$	5	"	"	"	"	365
" " #29 NW$\frac{1}{4}$	3	"	"	"	"	365
" " #30 "	"	"	"	"	"	366
" " #31 "	"	"	"	"	"	366
" " #32 N$\frac{1}{2}$	"	"	"	"	"	367
" " #33 NE$\frac{1}{4}$	"	"	"	"	"	367
(Incorrectly described as being in Range 25 West)						
" " #34 NE$\frac{1}{4}$	3	30S	25E	11/1/53	39	368
" " #35 "	"	"	"	"	"	368
" " #36 "	"	"	"	"	"	369
" " #37 E$\frac{1}{2}$ E$\frac{1}{2}$	"	"	"	"	"	369
" " #38 E$\frac{1}{2}$	"	"	"	"	"	370
" " #39 "	"	"	"	"	"	370
" " #40 "	"	"	"	"	"	371
" " #41 Center of	"	"	"	"	"	371
" " #42 W of Center of	"	"	"	"	"	372
" " #43 W$\frac{1}{2}$	"	"	"	"	"	372
" " #44 "	"	"	"	"	"	373
" " #45 W$\frac{1}{2}$ 3, E$\frac{1}{2}$	4	"	"	"	"	373
" " #46 E$\frac{1}{2}$	"	"	"	"	"	374
" " #47 "	"	"	"	"	"	374
" " #48 "	"	"	"	"	"	375
" " #49 Center of	"	"	"	"	"	375
" " #50 " "	"	"	"	"	"	376
" " #51 W of Center of	"	"	"	"	"	376
(Incorrectly described as being in Range 25 West)						
" " #52 W$\frac{1}{2}$	4	30S	25E	11/1/53	39	377
" " #53 "	"	"	"	"	"	377
" " #54 W$\frac{1}{2}$W$\frac{1}{2}$ 4, E$\frac{1}{2}$E$\frac{1}{2}$	5	"	"	"	"	378
Ilena #1 SW$\frac{1}{4}$	27	30S	24E	10/14/53	37	124
" # 2 "	"	"	"	"	"	125
" # 3 "	"	"	"	"	"	126
" # 4 "	"	"	"	"	"	127
" # 5 N$\frac{1}{2}$	"	"	"	"	"	128
" # 6 SE$\frac{1}{4}$	"	"	"	"	"	129
" # 7 "	"	"	"	"	"	130
" # 8 "	"	"	"	"	"	131

Name of Claim	Description Sec.	Twp.	Rg.	Date of Location	County Clerk and Recorder's Book and Page Book	Page
Ilena # 9 SE$\frac{1}{4}$ 27,SW$\frac{1}{4}$	26	30S	24E	10/14/53	37	132
" #10 SW$\frac{1}{4}$	"	"	"	"	"	133
" #11 "	"	"	"	"	"	134
" #12 W$\frac{1}{2}$	27	"	"	10/18/53	"	193
" #13 "	"	"	"	"	"	194
" #14 "	"	"	"	"	"	194
" #15 NW$\frac{1}{4}$	"	"	"	"	"	195
Joan # 6	28	"	"	10/14/53	"	104
" # 7	"	"	"	"	"	105
" # 8	"	"	"	"	"	106
" # 9	"	"	"	"	"	107
" #10	"	"	"	"	"	108
" #11	"	"	"	"	"	109
" #12	"	"	"	"	"	110
" #13	"	"	"	"	"	111
" #14	27 & 28	"	"	"	"	112
" #15 E$\frac{1}{2}$ 28, W$\frac{1}{2}$	27	"	"	10/18/53	"	190
" #16 E$\frac{1}{2}$	28	"	"	"	"	190
" #17 "	"	"	"	"	"	191
" #18	"	"	"	10/14/53	"	113
" #19	"	"	"	"	"	114
" #20	"	"	"	"	"	115
" #21 W$\frac{1}{2}$	"	"	"	"	"	116
" #22 "	"	"	"	"	"	117
" #23 "	"	"	"	"	"	118
" #24	"	"	"	"	"	119
" #25	"	"	"	"	"	120
" #26	"	"	"	"	"	121
" #27	"	"	"	"	"	122
" #28	"	"	"	"	"	123
" #29 NE$\frac{1}{4}$	"	"	"	10/18/53	"	191
" #30 "	"	"	"	"	"	192
" #31 "	"	"	"	"	"	192
" #32 NE$\frac{1}{4}$ 28,NW$\frac{1}{4}$	27	"	"	"	"	193
" #37	21 & 28	"	"	5/8/54	93	294
" #42 S$\frac{1}{2}$	21	30S	24E	10/18/53	37	294
" #45 Near Center	"	"	"	"	"	295
" #47 N$\frac{1}{2}$	"	"	"	"	"	295
LaPreal # 1		"	"	10/14/53	"	136
" # 2 NW$\frac{1}{4}$	33	"	"	"	"	137
" # 3 "	"	"	"	"	"	138
" # 4 N$\frac{1}{2}$	"	"	"	"	"	139
" "	"	"	"	"	"	135
" # 6 "	"	"	"	"	"	140
" # 7 NE$\frac{1}{4}$	"	"	"	"	"	141
" # 8 "	"	"	"	"	"	142
" # 9 NW$\frac{1}{4}$ 34, NE$\frac{1}{4}$	"	"	"	"	"	143
" #10 "	34	"	"	"	"	144
" #11 "	"	"	"	"	"	145
" #12 "	"	"	"	"	"	146
" #13 "	"	"	"	"	"	147
" #14 N$\frac{1}{2}$	"	"	"	"	"	148
" #15 NE$\frac{1}{4}$	"	"	"	"	"	149
" #16 "	"	"	"	"	"	150
" #17 "	"	"	"	"	"	151
" #18 NW$\frac{1}{4}$ et, NE$\frac{1}{4}$	"	"	"	"	"	152
" #19 NW$\frac{1}{4}$	35	"	"	"	"	153
" #20 "	"	"	"	"	"	154

Together with all and singular the hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion

and reversions, remainder and remainders, rents, issues and profits thereof; and all the estate, right, title, interest, claim and demand whatsoever, of the said parties of the first part, either in law or equity, of, in and to the above bargained premises, with the hereditaments and appurtenances.

TO HAVE AND TO HOLD the said premises above bargained and described, with the appurtenances, unto the said party of the second part, its successors and assigns forever.

And the said parties of the first part, for themselves, their heirs, executors and administrators, do covenant, grant, bargain and agree to and with the said party of the second part, its successors and assigns, the above bargained premises in the quiet and peaceable possession of the said party of the second part, its successors and assigns, against all and every person or persons lawfully claiming or to claim the whole or any part thereof, by, through or under the said parties of the first part to WARRANT AND FOREVER DEFEND.

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

/s/ Jack D. Gay
Jack D. Gay

/s/ Viola E. Gay
Viola E. Gay

STATE OF WASHINGTON)
: SS.
COUNTY OF CLARK)

On this 13th day of July, 1954, before me, the undersigned, a Notary Public for the State of Washington personally appeared JACK D. GAY and VIOLA E. GAY, his wife, known to me to be the persons whose names are subscribed to the within instrument and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Notarial Seal the day and year in this certificate first above written.

Notary Public in and for the
State of Washington, residing at
Vancouver, Washington

My Commission Expires: Aug. 4, 1955.

SEAL

MF-203
(Revised July 1, 1954)

OWNER'S CONSENT TO LIEN

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

See Exhibit 1.

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

2/ the Pathfinder Uranium Corporation, a Utah corporation.

hereinafter called the "Operator"; and

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

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

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

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

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

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

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

(OVER)

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

4. Changes and added provisions None.

Dated this 20th day of DECEMBER, 1954.

John A Goldberg [Seal]

Joan M. Goldberg [Seal]

[Seal]

Exhibit 1.

PROPERTY OF PATHFINDER URANIUM CORPORATION

(Located in San Juan County, Utah)

Name of Claim	Date of Location	County Clerk and Recorder's Book and Page	
		Book	Page
Ilena #1	10/14/53	37	124
" #2	"	"	125
" #3	"	"	126
" #4	"	"	127
" #5	"	"	128
" #6	"	"	129
" #7	"	"	130
" #8	"	"	131
" #9	"	"	132
" #10	"	"	133
" #11	"	"	134
" #12	10/18/53	"	193
" #13	"	"	194
" #14	"	"	194
" #15	"	"	195
Joan #6	10/14/53	"	104
" #7	"	"	105
" #8	"	"	106
" #9	"	"	107
" #10	"	"	108
" #11	"	"	109
" #12	"	"	110
" #13	"	"	111
" #14	"	"	112
" #15	10/18/53	"	190
" #16	"	"	190
" #17	"	"	191
" #18	10/14/53	"	113
" #19	"	"	114
" #20	"	"	115
" #21	"	"	116
" #22	"	"	117
" #23	"	"	118
" #24	"	"	119
" #25	"	"	120
" #26	"	"	121
" #27	"	"	122
" #28	"	"	123
" #29	10/18/53	"	191
" #30	"	"	192
" #31	"	"	192

Name of Claim	Date of Location	County Clerk and Recorder's Book and Page	
		Book	Page
Joan #32	10/18/53	37	193
" #36	5/8/54	93	109
" #37	10/18/53	37	294
" #38	5/8/54	93	109
" #42	10/18/53	37	294
" #45	"	"	295
" #47	"	"	295
La Preal #1	10/14/53	"	136
" " #2	"	"	137
" " #3	"	"	138
" " #4	"	"	139
" "	"	"	135
" " #6	"	"	140
" " #7	"	"	141
" " #8	"	"	142
" " #9	"	"	143
" " #10	"	"	144
" " #11	"	"	145
" " #12	"	"	146
" " #13	"	"	147
" " #14	"	"	148
" " #15	"	"	149
" " #16	"	"	150
" " #17	"	"	151
" " #18	"	"	152
" " #19	"	"	153
" " #20	"	"	154

SPECIAL WARRANTY DEED

THIS DEED, made this 12 day of July, 1954, between JOHN A. SOELBERG and JOAN M. SOELBERG, his wife, of the County of Mesa, State of Colorado, Parties of the First Part, and PATHFINDER URANIUM CORPORATION, a Utah corporation, with its principal offices at 901 Walker Bank Building, Salt Lake City, Utah, Party of the Second Part;

W I T N E S S E T H :

That the said Parties of the First Part, for and in consideration of the sum of Ten Dollars ($10.00) and other valuable consideration, to the Parties of the First Part in hand paid by the Party of the Second Part, receipt whereof is hereby confessed and acknowledged, have granted, bargained, sold and conveyed, and by these presents do grant, bargain, sell, convey and confirm unto the said Party of the Second Part, its successors and assigns forever, all the following described mining claims situate, lying and being in the County of San Juan, State of Utah:

Name of Claim	Description Sec.	Twp.	Rg.	Date of Location	County Clerk & Recorder's Book and Page Book	Page
Joan #36	21 & 28	30S	24E	5-8-54	93	109
Joan #38	21 & 28	"	"	"	"	109

Together with all and singular and hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof; and all the estate, right, title, interest, claim and demand whatsoever, of the said Parties of the First Part, either in law or equity, of, in and to the above bargained premises, with the hereditaments and appurtenances.

TO HAVE AND TO HOLD the said premises above bargained and described, with the appurtenances, unto the said Party of the Second Part, its successors and assigns forever.

And the said Parties of the First Part, for themselves, their heirs, executors and administrators, do covenant, grant, bargain and

agree to and with the said Party of the Second Part, its successors and assigns, the above bargained premises in the quiet and peaceable possession of the said Party of the Second Part, its successors and assigns, against all and every person or persons lawfully claiming or to claim the whole or any part thereof, by, through or under the said Parties of the First Part to WARRANT AND FOREVER DEFEND.

IN WITNESS WHEREOF, the said Parties of the First Part have hereunto set their hands and seals the day and year first above written.

/s/ John A. Soelberg
John A. Soelberg

/s/ Joan M. Soelberg
Joan M. Soelberg

STATE OF COLORADO)
) SS.
COUNTY OF MESA)

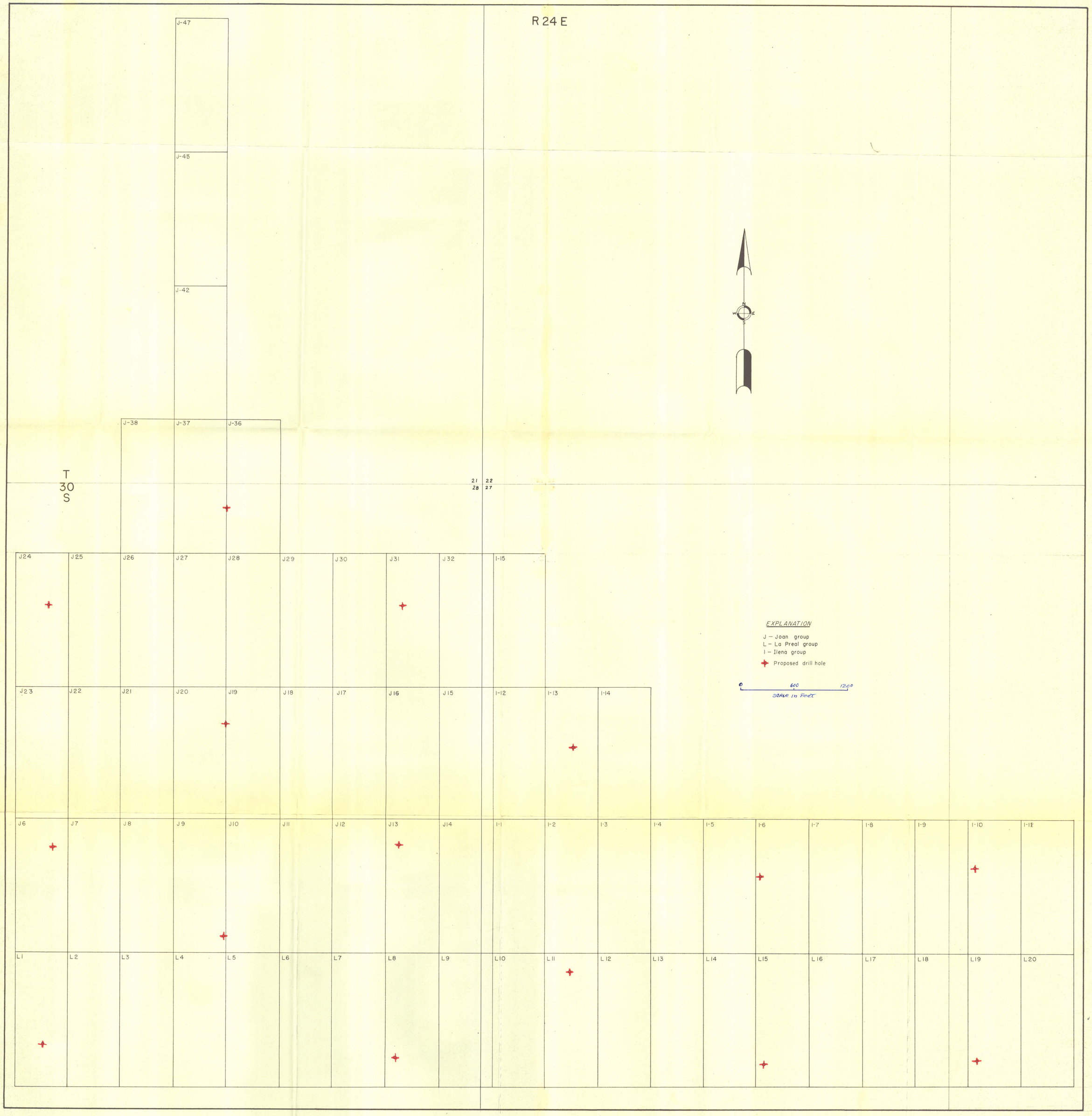
The foregoing instrument was acknowledged before me this 12th day of July, 1954, by JOHN A. SOELBERG and JOAN M. SOELBERG, his wife.

Witness my hand and official seal.

/s/ Scott W. Heckman
Notary Public

My commission expires:

April 21st 1956



Drill Stage Map Pathfinder Property Big Indian Wash, San Juan County Utah