Stanley R. Grant, Agent
42 Wall Street
New York City, N. Y.

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MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

RECEIVED
APR 26 1955

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. 3791
Metal or Mineral Uranium
Date Received 4-26-55
Estimated Cost $119,147.50
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: STANLEY R. GRANT, Agent
42 Wall Street
New York, New York

(*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 SHEETS

(*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 SHEETS

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

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

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

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

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

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. SEE ATTACHED SHEETS

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

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

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

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if ne[illegible]) 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. SEE ATTACHED SHEETS

(*c*) The work will start within 60 days and be completed within 5 months from the date of an exploration project contract.

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

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

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

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

(*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 ab[illegible] SEE ATTACHED SHEETS

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

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

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

☒ 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 _____, 195__

Stanley R. Grant Agent
(Applicant)

By _____

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any de[illegible]ment or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

STANLEY R. GRANT, AGENT
42 Wall Street
New York, N. Y.

Form
MF-103

1. NAME OF APPLICANT

(a) Stanley R. Grant, Agent
42 Wall Street
New York, N. Y.

(b) Applicant is agent for a syndicate composed of the following persons, all of whom may be addressed at

Carl M. Loeb, Rhoades & Co.
42 Wall Street
New York, N. Y.:

Frances L. Loeb, John L. Loeb, Henry A. Loeb, Carl M. Loeb, Jr., Paul Felix Warburg, A. G. Erpf, C.W. Michel, Margaret L. Kempner, M. J. Millard, Peter Treves, Samuel L. Stedman, W. P. Dixon, Henry L. Moses, Lucy G. Moses, and H. A. Widenmann.
A copy of the syndicate agreement is attached as Exhibit "A".

(c) Not applicable

(d) Not applicable

3. APPLICANT'S PROPERTY RIGHTS

(a) The land to be explored consists of 75 unpatented, lode mining claims covering a portion of the Big Flat in the Inter-river Area of Grand County, Utah. The following list approximates the legal description of the claims:

5 claims in SE portion	Sec. 3, T 26 S, R 19 E
5 claims in SW portion	Sec. 2, T 26 S, R 19 E
All but NW corner	Sec. 10, T 26 S, R 19 E
All	Sec. 11, T 26 S, R 19 E
900' along N side	Sec. 15, T 26 S, R 19 E
900' along N side	Sec. 14, T 26 S, R 19 E

The claims are contiguous, forming a single block of approximately 1500 acres (see accompanying Map No. 1, Area Map, and Map No. 2, Claim Map). As shown on the claim map, applicant controls, in addition to the claims covered by this application, an additional large number of claims, but only the claims shown in red on Map No. 1 and described in detail in Exhibit (D) are to be considered in the exploration project contract.

(b) Not applicable

(c) Lessee

(d) See attached Farm-out Agreement, Exhibit "B",
See attached Owner's Consent to Lien, Exhibit "C".

(e) Not applicable

(f) See attached Claim Recording Date, Exhibit "D".

STANLEY R. GRANT, AGENT
42 Wall Street
New York, N. Y.

Form
MF-103

4. PHYSICAL DESCRIPTION

(a) During the period from 1947 through 1954, four deep holes were drilled on the land covered by this application. The first hole, drilled by Tidewater Associated Oil Company to a depth of 8390 feet, is located on Claim 26-U-11-24. In 1941, Glen M. Ruby, operator drilled the second hole to a depth of about 8000 feet on Claim 26-U-11-12. The third and fourth holes, drilled in 1953 and 1954, by King Oil Company, are located approximately on Claims 26-U-11-34 and 26-U-14-1, respectively.

In 1949, the Lane Wells Company completed a radioactivity log of the Tidewater Associated well (Big Flat #74-11) and, in 1953, a similar log of the Glen M. Ruby, Operator well (Ruby No. 1-A). Photostatic copies of the upper portions of these logs are included in Exhibit "E". The log of the Big Flat #74-11 (TWA) hole shows a very weak anomaly in the interval from 760-770 feet (Elevation: 5390-5380') and again at 1008 feet (Elev: 5143') and a somewhat stronger radioactive anomaly at 1031 feet (Elev: 5120'). Conversion data supplied by the Lane-Wells Company show that the anomaly at 1031 feet has a maximum intensity equal to approximately 30 micro-Roentgens per hour.

The Gamma ray log of the Ruby #1-A well shows two anomalies similar to the lowest one in the Big Flat #74-11 well. The upper anomaly, at 738-744 feet (Elev: 5309-5303'), has a maximum intensity equivalent to 21.6 micro-Roentgens per hour and the lower one, at 924-937 feet (Elev: 5123-5116'), is equivalent to 31.2 micro-Roentgens per hour, as reported in a letter from J. A. Baker of the Lane-Wells Company. Based on assays in adjoining holes, these anomalies represent uranium mineralization of about 0.05%.

Although interpretation of these logs did not indicate commercial grade uranium ore in mineable thickness, the anomalies indicated sufficient mineralization to warrant further investigation. Accordingly, in January, 1954, an area covering approximately 30,000 acres, including the area considered herein, was located by lode mining claims. During the period from October to December, 1954, Amended Notices of Location, to take advantage of Public Law 585, were posted on the claims and recorded.

During the period from December, 1954 through February 8, 1955, an exploration drilling campaign, totaling twenty-seven holes with a total of 22,606 feet, was conducted by the applicant on a portion of the claims under the terms of the Farm out Agreement (see Exhibit "B"). The work was under the overall supervision of D. F. Haley, Consulting Mining Engineer of New York City and under the direct supervision of E. H. Eakland, Jr., Consulting Geologist, of the Uranium Engineering Company of Salt Lake City, Utah. The entire program was financed by the syndicate, for which Stanley R. Grant, applicant, is agent.

4. (a) (Continued)
The drilling program consisted of plug-bit drilling to the approximate horizon of the upper, mineralized sandstone, coring 40-50 feet of this zone, then plugging to within 40 feet of the Chinlee-Moenkopi contact and coring the lower 30-40 feet of the Chinlee formation and the upper 5-10 feet of the underlying Moenkopi formation. Radiometric surveys of all holes were made by the Empire Logging Company, of Moab, Utah. Selected zones, showing appreciable radiation, were assayed chemically by Smith Laboratories, of Moab, Utah.

The geologic results, geologic and radiometric logs and assay results of the holes drilled in the area of this application and an interpretation of the geologic features of the general area are given in a report by E. H. Eakland, Jr., which is attached [redacted].

There are no underground workings on the property. All of the core taken during the exploratory drilling program is boxed and housed at the Big Flat Camp (at the site of the Big Flat Unit #1 well) and is available for inspection.

(b) There has been no past, nor is there present, production from the property. The exploration drilling program showed uranium mineralization in all of the holes drilled on the property covered by this application, but did not develop any ore reserves.

(c) The land covered by this application is a small portion of the Big Flat, a rolling plateau lying between the Green and Colorado Rivers at an elevation of 5500 to 6000 feet.

Surface outcrops are of the Kayenta and Navajo formations. Most of the area is underlain by 100 to 300 feet of the reddish-purple sandstones and silty sandstones of the Kayenta formation, underlain by 310 to 350 feet of Wingate formation, a massive, friable, light-tan, quartzitic sandstone.

Beneath the Wingate formation is the Chinlee formation which is 345 to 400 feet thick. This formation has an upper zone which is predominantly red shale and red, silty sandstone, about 100 to 150 feet thick. The lower unit, 200 feet thick, is predominantly gray, fine-grained sandstone containing intercalated gray and gray-green mudstone members comprising approximately 25% of the total section. Carbon, in the form of carbonized wood fragments and thin trash layers, is a common constituent of the sandstone units. Limestone-pebble and clay-pebble conglomerates occur sporadically throughout the lower zone in one to ten foot lenses.

Beneath the sandstone units of the Chinlee formation are the red-brown or brick-red siltstones and mudstones of the Moenkopi formation. In almost all of the holes drilled during the exploration program, the upper 2 to 5 feet of the Moenkopi formation shows

4. (c) (Continued)
bleaching, discoloration and some reworking. The original brick-red color has been altered to a yellow-brown or purple, due to the presence of iron and manganese oxides, minute crystals of pyrite are disseminated throughout the zone and discontinuous stringers of red chert, having weak to moderate radiation, are common. This zone of mineralization and discoloration corresponds to Finch's "purple-white band" described in USGS TEI Report 328.

Structurally the area lies along the axis and southwest flank of the Cane Creek Anticline, a broad, gentle arch which runs northwesterly across the Big Flat area. Although the maximum arching probably took place during the Tertiary period, thinning of the Triassic Chinlee formation across the anticline indicates that the structure was present during the deposition of Chinlee and younger formations. A conjugate system of northwest and northeast jointing is locally prominent, but there is little or no movement along the joint planes and no faults are known in the immediate area.

The completed drilling indicates that low-grade uranium mineralization is widespread in the basal Chinlee sandstones and sporadically present in an upper Chinlee sand, about 250 feet above the base, in the area of the anticlinal axis and on the southwest flank. Uranium mineralization, associated with carbonaceous trash and fine-grained sandstone containing disseminated pyrite, is present in both horizons. The carbon frequently contains marcasite, replacing the wood structure.

Drilling in the area of the Ruby No. 1 well has shown a channel scour at the base of the Chinlee formation. The present drilling indicates a westerly trend to the channel, but there is an indicated bend, on the east end, to the southeast. Drilling has not determined the full width of the channel, but it is at least 200 feet wide and has a known relief of seven feet. In addition to the Ruby No. 1 well, six holes were drilled to determine the extent and trend of the channel and the presence of uranium mineralization. Four holes showed uranium mineralization in the basal sandstone unit, one hole was mineralized in the upper horizon and one hole, on the north side of the channel, was barren in both horizons. Results of the drilling are given in the geologic report. [redacted].

(d) The land is located approximately forty miles, by road, southwest of Thompsons, Utah, a freight and passenger station on the D.R.G.W. railroad and approximately twenty-six miles, by road, from Moab, Utah. The entire area is accessible by the Seven-Mile Canyon road which leaves U.S. Highway 160 at a point eleven miles north of Moab. The Big Flat #1 well is 15 miles from this junction over a good, graded, dirt road. Access roads were built throughout the property during the exploration drilling program completed in February, 1955.

Housing and supplies are available at Moab, Utah (26 miles from the property). Permanent housing for a seven-man crew is available at the Big Flat #1 Well. During the previous drilling program, the

4. (d) (Continued)
contract driller maintained a trailer and portable-housing camp at the well.

(e) Labor, materials, supplies and equipment are available in reasonable variety and quantity at Moab, Utah, 26 miles from the property. Water for drilling, mining and domestic use is available at Moab, Utah and, throughout most of the year, at a spring in Seven-Mile Canyon, 13 miles from the property. Commercial power is not available. Diesel-generated power will be used during exploration or mining activities.

5. THE EXPLORATION PROJECT

(a) Uranium

(b) The proposed exploration program will consist of drill holes to extend the mineralized channel found during the preliminary drilling and to explore this channel for commercial mineralization.

During the first stage of drilling, as shown on Map No. 3, five "fences" of four holes each, will be drilled across the projected extension of the channel. The locations shown on Map No. 3 are approximations. The exact locations to be determined as the drilling progresses.

A second stage of drilling, whose execution will depend on favorable results being found in the first stage, will consist of ten holes to explore for and extend commercial mineralization in the developed channel.

(c) Work will start within 60 days and be completed within 5 months from the date of an exploration project contract.

(d) Stanley R. Grant, Agent, has been active in uranium exploration since January, 1954. Through the syndicate for which Mr. Grant is agent, he is in a position to supply or cause to be supplied financial, legal and/or technical assistance and supervision to the project. Actual direction of operation will be performed by Mr. Dennis F. Haley, a well-known mining engineer who has had many years experience in the development and operation of mining properties, including fifteen years as Vice-President of Climax Molybdenum Company, during which period he was in charge of the Mining Department.

6. ESTIMATE OF COSTS

(a) First Stage Drilling: 19 holes @ 925 feet each.

Plug-bit drilling: 845 ft. per hole	
Total: 16,055 ft. at $3.50/ft.	$ 56,192.50
Diamond-bit coring: 80 ft. per hole	
Total: 1,520 ft. @ $6.00/ft.	9,120.00

6. (a) (Continued)

Second Stage Drilling: 10 holes @ 925 ft. each.

Plug-bit drilling: 845 ft. per hole Total: 8,450 feet @ $3.50/ft.	$ 29,575.00
Diamond-bit coring: 80 ft. per hole Total: 800 feet @ $6.00/ft.	4,800.00
Two drill rigs, operating 24 hrs./day will be used on first and second stage drilling.	
Road construction: Access roads to drill sites and road repair. All work can be done with bull-dozer without blasting. Total: 20 days at $100.00 per day	2,000.00
Supervision and consultants (Itemized below)	9,000.00
Miscellaneous (Itemized below)	3,460.00
Contingencies	5,000.00
TOTAL COST OF PROGRAM	$119,147.50

(b)

Supervision (1 man, full time)	$3,000
Geologist (2 men, full time)	4,000
Surveying (1 surveyor, 1 helper who will also handle sampling, core)	2,000

(c) None

(d) None

(e) None

(f) None

(g)

Radiometric Probing: 29 holes @ $90/hole.	$2,610.00
Core racks	400.00
Core boxes: 100 boxes @ $3/box	300.00
Assaying: 50 assays @ $3/assay	150.00

(h) Contingencies: Estimated amount to cover such unforeseeable items as reconditioning holes for probing, coring in excess of amount allowed above, additional assaying, etc. 5,000.00

GEOLOGIC REPORT ON

BIG FLAT UNIT EXPLORATION PROGRAM

Inter-River Area

Grand County
Utah

March, 1955
E. H. Eakland, Jr.

Introduction

This report covers, in general, the results of an exploration drilling program on the Big Flat Unit and, in more detail, the results of the exploration program on a small portion of the Big Flat Unit which appears to have the more persistant mineralization and the strongest possibility of developing commercial deposits of uranium mineralization.

Location and Accessibility

As shown on the accompanying Index Map, the portion of the Big Flat Unit covered by this report lies midway between the Green and Colorado rivers and approximately fifteen airline miles due west of the town of Moab, Grand County, Utah. The ground covers portions of Sections 2, 3, 10, 11, 14 and 15, T 26 S, R 19 E, SLBM, as shown on the Claim Map (Map No. 2, 1" - 4000').

The area is readily accessible from paved, U. S. Highway No. 160, which runs northerly from Moab to Crescent Junction, Utah. At a point eleven miles north of Moab, a well-maintained, dirt road (marked "Deadhorse Point") runs westerly and southwesterly to a fork, about fourteen miles from the turn-off. The left-hand fork runs southerly across the center of the area to King Oil Company's Ruby No. 2 well and on to Deadhorse Point. The right-hand fork crosses, in a southwesterly direction, the west half of the area. During the exploration drilling, access roads were built throughout the western half of the claims.

Physical Description

The area, comprising approximately 1500 acres, lies at elevations between 5800 and 6200 feet. On the eastern edge of the claims, a prominent hill, locally called The Knoll, rises a short distance above the general

surface to 6316'. The surface is a gently-rolling, elevated plateau with a poorly-defined drainage system which drains into the deeply-incised canyons forming the periphery of the Big Flat Unit. The surface is partially covered by a thin mantle of residual soil and wind-blown sands which support a sparse growth of juniper, pinon and cedar and an undergrowth of sage-brush, ephedra and grass.

The climate is typically arid, with an average rainfall of 6 to 9 inches, much of which comes in local thundershowers during the summer months. The summers are long and hot and the winters generally mild. Water for domestic and exploration use may be hauled from Seven Mile Canyon, about 15 miles northeast of the property, or from Moab.

Background of Uranium Occurrences

During the course of an exploration drilling program for commercial oil and gas production, four deep holes have been drilled on the area covered by this report during the years from 1947 to 1955. The location of these wells is shown on Area Map (Map No. 1, 1" - 2000'). Gamma-ray logs were made of two of these holes (Tidewater Associated's Big Flat #74-11 and Glen M. Ruby, Operator's Ruby No. 1-A) by the Lane-Wells Company. Photostatic copies of the upper portions of these two logs are included, in a separate cover, with the radiometric logs of the holes completed during the uranium exploration drilling. The logs showed radioactive anomalies, in both wells, at two distinct horizons in the Chinlee formation. Interpretation of the measured, radioactive intensities did not indicate commercial mineralization, but the magnitude and continuity warranted further exploration.

In January, 1954, an area covering approximately 30,000 acres was staked, with mineral lode claims by J. Murray Ruby of Moab, Utah and by Glen M. Ruby, of Salt Lake City, Utah. Subsequently, Amended Notices of Location, to comply with Public Law 585, were posted on the claims. Title to the claims was transferred to The Glen Ruby Uranium Corporation of Delaware.

Farmout Agreements were made on 100 claims with the Vanadium Corporation of America and, on 169 claims, with Stanley R. Grant, Agent, of 42 Wall Street, New York City (see Map No. 2).

Under the terms of the Farmout Agreement with Stanley R. Grant, Agent, an exploration drilling campaign was conducted on the Big Flat Unit during the period from December, 1954 through February 6, 1955. In the area covered by this report, eleven holes, totaling 9,901 feet, were drilled down to the Moenkopi formation. This drilling program was part of a larger program, consisting of twenty-seven holes, totaling 22,636 feet. The balance of the holes were drilled to the north and west of the area being herein considered.

General Geology

The surface rocks of the Big Flat Unit are predominantly of the Jurassic Kayenta formation. The formation consists of red-brown, cross-bedded, coarse-grained sandstone with minor silty sandstone and shale lenses. The complete section was not drilled, so no measurement of the thickness is available from the drill records. The probable thickness is in the range of 225 feet. The contact between the Kayenta formation and the underlying Wingate formation is probably an erosional unconformity, with a relief of 30 to 50 feet, based on outcrops in the general area and on the variations in the thickness of the Wingate.

Underlying the Kayenta formation is the massive, light-brown, medium-grained sandstone of the Jurassic Wingate formation. Drill hole information shows that this unit is about 330 feet thick, but individual thicknesses range from 400 feet down to 293 feet. Part of this discrepancy may be due to inability to accurately pick the upper contact, as the two units are very similar in radiometric response. The contact at the base of the Wingate formation appears to be gradational into the underlying Chinlee shales and was arbitrarily placed at the top of the first good shale member.

Beneath the Wingate sandstone is the Triassic Chinlee formation, a thick series of shale and sandstone. Drill holes, on Sections W-29, W-32, W-5 and W-8 (see Map No. 2), show that the Chinlee formation thins across the axis of the Cane Creek Anticline, ranging from 390 feet thick on the north flank (Claim 20, Sec. W-29) to 340 feet on the axis (Claim 17, W-5). In the area of this report, the unit varies from 335 feet to 456 feet in thickness, but the majoirty of the holes show a thickness between 360 feet and 400 feet.

The Chinlee formation consists of two, rather distinct units--an upper zone, 70 to 110 feet thick, which is predominantly red-brown and purple shale and a lower zone, 250 to 300 feet thick, which is predominantly fine-grained sandstone with intercalated, gray mudstone beds. Most of the drill holes showed a thin bed (1 to 3 feet thick) of conglomeratic sand and clay pebbles at the base of this lower zone.

A distinct, erosional unconformity exists at the base of the Chinlee formation. A paleochannel, having a relief of at least seven feet, was partially delineated in the area of the Ruby No. 1-A well and other channels exist along the canyon walls which border the Big Flat.

Beneath the Chinlee formation is the Triassic Moenkopi formation. Drill holes were continued for only five to twenty feet into this unit which, at the top, consists of bleached, mineralized zone several feet thick, underlain by red-brown and purple-brown sandy shale or silty mudstone. The bleached zone, which corresponds to Finch's "purple-white band" appears to be reworked (?) Moenkopi mudstone, hydrothermally altered and mineralized with minute cubes of pyrite, dendritic manganese, fine-grained silica (red chert stringers occur frequently at this horizon) and some crystalline calcite. The bleached zone is usually white to light gray, relatively soft, massive clay which is mottled with red, purple and orange iron and manganese staining.

Uranium Mineralization

Radiometric logs and chemical assays of core show that uranium

mineralization in the Big Flat area is confined to the lower, sandy zone of the Chinlee formation and the bleached zone at the top of the Moenkopi formation.

The radiometric log of Hole 26-U-11-12-D1 shows a zone of weak mineralization about 160 feet above the base of the Chinlee formation, at approximately the same horizon as the Tibbets Prospect in Mineral Canyon. This unit is herein referred to as the Tibbets sand. The zone of mineralization is characterized by abundant, paper-thin carbonaceous partings in the sandstone and frequent carbonized wood fragments which have been wholly or partially replaced by marcasite. The zone does not have a basal mud or shale and appears to vary in stratigraphic position. Mineralization in this zone appears to be sporadic and weak and was found in only a few of the twenty-seven holes.

The strongest and most persistant uranium mineralization occurs at the base of the Chinlee formation and in the upper one-foot of the Moenkopi formation. The zone is characterized, in mineralized holes, by abundant carbonized wood fragments in the fine-grained sandstone and in the basal conglomerate, by marcasitic-replacement of the wood, by disseminated, fine crystals of pyrite in the Chinlee sandstone and somewhat more pronounced in the bleached Moenkopi clay, occasionally by stringers of red, radioactive chert in the top of the Moenkopi and by pyritic-replacement of the clay pebbles in the Chinlee conglomerate.

In the vicinity of the Ruby No. 1-A well (see Map No. 4), a paleochannel was partially delineated by drilling. Five of the six holes were mineralized at the base of the Chinlee sandstone, two of the holes showing short sections of commercial ore (greater than 0.10%). Drill cores showed that a channel mud exists in the scoured channel in the area drilled, underlain by one to two feet of conglomerate which carries the uranium mineralization. Additional drilling to delineate the channel beyond the area of the

mud lens into an area where a thicker sandstone or conglomerate may contain commercial deposits of uranium appears warranted. A tentative program to further delineate the channel, followed by a second stage of drilling to explore areas favorable for sizeable deposits is shown on Map No. 3. The location of the proposed holes is not rigid, but should be varied as the results of the drilling indicate.

Respectfully submitted,

Edward H. Eakland, Jr.

Edward H. Eakland, Jr.
Consulting Geologist

March 8, 1955
Salt Lake City, Utah

DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-U-10-16-D1
Date Spudded: 1/10/55 Completed: 1/14/55
Coordinates: North--30,300' East--28,558'

Drill Summary

	Depth	Elevation
Collar	0'	5963'
Base of Kayenta Fm.		
Base of Wingate Fm.	507'	5456'
Base of Chinlee Fm.	874'	5089'
Bottom of hole	882'	5081'

Mineralization

	Depth
Mineralized, max. intensity of 1820 counts/sec.	868-870'
Chemical Assay: 1.0' - 0.051%	871-872'

Geologic Log

Depth	Interval	Description
0-652'	652'	Plug-bit drilled.
652-660	8'	F.gr'd, lt. reddish-gray ss. Generally massive with rare shale partings.
660-664	4'	F.gr'd ss, lt. gray containing 40% gry-grn clay, wkly diss. specks pyrite. Few frag'ts carbon w. pyrite in lower 6". Calcareous cement.
664-682	18'	F.gr'd, lt. gray, argillaceous ss, generally finely laminated. Moderately calc. Laminae consist of abundant muscovite, rare biotite, specks carbon. At 676, 2" calc. ss with diss. pyrite.
682-684-	2'	F.gr'd ss and clay pebble cngl. Abun. pyrite and carbon on partings
684-688	4'	F.gr'd, lt. gry, laminated ss. Calc. Abundant muscovite on laminae.
688-689	1'	F.gr'd ss w. abundant carbon and bleby pyrite.
689-693	4'	F.gr'd ss and clay cngl. Thin bands carbon w. diss. and bleby pyrite.
693-700	7'	F.gr'd ss, lt. gry-grn, calc ss. Generally massive. Mk. carbon and pyrite in upper 2' and clay-pebble cngl w. carbon and pyrite in lower 2'.
700-810	110'	Plug-bit drilled
810-840	30'	Dk. gray to dk. gry-grn, massive mudstone. Locally thin, laminated siltstone.
840-846	6'	F.gr'd, lt. gray, calc. ss w. scattered specks carbon and rare pyrite. 2" gray mudstone at base.
846-853	7'	F. to med'gr'd, lt. gry, calc. ss. Generally massive, trace carbon.
853-854	1'	Clay cngl and f. gr'd ss
854-858	4'	Alternating f.gr'd ss and clay cngl in thin layers. Trace pyrite.

Depth	Interval	Description
858-861	3'	F.gr'd, lt. gray, laminated ss. Thin partings of carbon trash w. pyrite.
861-864	3'	Med. to crse.gr'd ss. Abundant clay pebbles in lower 1'.
864-872	8'	Med. gry-green siltstone and mudstone. Bottom one foot has wk. carbon and wk. radioactivity. Assay: 1' - 0.051%
872-874	2'	Interbdd. crse.gr'd, glassy quartz, calc. ss and med. grn clay shale. 1" $CaSO_4$ at base.
874		Chinlee-Moenkopi contact
874-876	2'	Mottled (maroon, lt. gry-grn, yel-brn and purple-gry), reworked (?) mudstone and silty sandstone. Scattered qtz. grains in upper 3". Specks iron and manganese oxides.
876-882	6'	Brick-red mudstone w. occas. lt. gray spots.
882		Bottom of hole

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DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-U-10-17-D1
Date Spudded: 1/8/55 **Completed:** 1/10/55
Coordinates: North--28,878' East--28,505'

Drill Summary

	Depth	Elevation
Collar	0'	5948'
Base of Kayenta Fm.	148'	5800'
Base of Wingate Fm.	483'	5465'
Base of Chinlee Fm.	866'	5082'
Bottom of hole	874'	5074'

Mineralization

	Depth
Spot of mineralization, max. intensity of 380 counts per second.	849'

No chemical assays.

Geologic Log

Depth	Interval	Description
0-697	697'	Plug-bit drilled
697-708	11'	Intercalated, f.gr'd, lt. gray ss and finely laminated siltstone.
708-711	3'	Crse.gr'd to congl., lt. gray to gray, ss w. 1" frag'ts carbon.
711-715	4'	F.gr'd, lt. gry to gry ss.
715-716	1'	Same as 708-711.
716-722	6'	Siltstone, gray to gry-brn, massive, somewhat sandy.
722-748	26'	Predominantly f.gr'd, lt. gry, silty ss and gray siltstone. Interbdd zone of massive and laminated.
748-750	2'	F. to med.gr'd, lt. gray, massive ss.
750-757	7'	F. to med.gr'd, lt. gray ss. Wkly laminated with gry-grn shale partings.
757-766	9'	F. to crse.gr'd, lt. gray ss and gray-grn siltstone. Clay pebbles in crse gr'd zones.
766-863	97'	Plug-bit drilled
863-866	3'	Massive, gray-green, sandy siltstone.
866		Chinlee-Moenkopi contact
866-874	8'	Brick-red mudstone and siltstone. Upper 3-4' has been bleached and stained. No pyrite.
874		Bottom of hole

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DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-U-10-13-B1
Date Spudded: 1/3/55 Completed: 1/6/55
Coordinates: North--29,751' East--28,705'

Drill Summary

	Depth	Elevation
Collar	0'	5914'
Base of Kayenta Fm.	85'	5829'
Base of Wingate Fm.	436'	5478'
Base of Chinlee Fm.	851'	5063'
Bottom of hole	862'	5052'

Mineralization

Radiometric log run to 582' only, due to caving in hole.
Log down to 582' showed no mineralization.

Weak radioactivity in core from 843 to 888'.
No chemical assays.

Geologic Log

Depth	Interval	Description
0-757	757'	Plug-bit drilled
757-769	12'	Intercalated, gry-brn, chocolate-brn, and gry, shaley siltstone, siltstone and sandy siltstone. Locally wkly. laminated.
769-773	4'	F.gr'd, gray-grn to gry ss.
773-780	7'	Siltstone, gry to gry-grn. Scattered frag'ts gry-grn clay. 2" of carbon at base.
780-788	8'	Gry-grn mudstone.
788-790	2'	F.gr'd, lt. gry ss w. scattered carbon frag'ts.
790-808	18'	F. to med.gr'd ss. with abundard clay-pebble cngl in upper 5' and lower 3'. Moderate amounts carbon and assoc. pyrite in cngl. No discernible radioactivity.
808-811	3'	F.gr'd, laminated ss and gray-grn mudstone.
811-848	37'	F.gr'd, lt. gry to lt. gry-grn, massive ss. Few, narrow, laminated zones. Lower 5' has minor carbonaceous partings, and wk. radioactivity.
848-851	3'	Med. to crse.gr'd ss w. scattered, thin. carbonaceous partings. V. wk. pyrite. No discernible radioactivity.
851		Chinlee-Moenkopi contact
851-862	11'	Brick-red mudstone and silty sandstone. Upper 3-4' bleached and mottled, purple red mudstone.
862		Bottom of hole

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DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-B-10-20-D1
Date Spudded: 1/7/55 Completed: 1/8/55
Coordinates: North--27,912' East--26,929'

Drill Summary

	Depth	Elevation
Collar	0'	5910'
Base of Kayenta Fm.	160'	5750'
Base of Wingate Fm.	457'	5453'
Base of Chinlee Fm.	847'	5063'
Bottom of hole	856'	5054'

Mineralization

	Depth
Radiometric log run to 797' only, due to bad hole.	
Log shows weak mineralization, maximum intensity of 480 counts/sec.	764-766
Chemical Assays: 0.2' - 0.024%	839
4.0' - 0.031%	837-841

Geologic Log

Depth	Interval	Description
0-836	836'	Plug-bit drilled.
836-842	6'	Med.gr'd, lt. gry- ss. w. thin partings and scattered, small fragts of carbon. 0.2' of carbon at 839'. Entire section wkly. radioactive.
842-847	5'	Med. to crse.gr'd, lt. gray ss w. abundant grn. clay pebbles, scattered carbon frag'ts.
847		Chinlee-Moenkopi contact
847-850	3'	Bleached, mottled mudstone w. wk. pyrite.
850-856	6'	Brick-red mudstone and silty sandstone. locally bleached (lt. gray) spots.
856		Bottom of hole.

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DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-U-10-23-D1
Date Spudded: 12/29/54 Completed: 12/31/54
Coordinates: North--28,588' East--25,185'

Drill Summary

	Depth	Elevation
Collar	0'	5862'
Base of Kayenta Fm.	250'	5612'
Base of Wingate Fm.	543'	5319'
Base of Chinlee Fm.	836'	5026'
Bottom of hole	843'	5019'

Mineralization

	Depth
Spot of mineralization, max. intensity of 330 counts/secons.	720'
Chemical assays: 0.2' - 0.036%	836'
0.7' - 0.019%	835-836'

Geologic Log

Depth	Interval	Description
0-789	789'	Plug-bit drilled.
789-791	2'	F.gr'd, choc-brn, silty ss.
791-815	24'	Intercalated, choc-brn to lt. gray and gry-grn, f.gr'd ss and silty ss. Moderately calcareous. Wkly laminated w. rare pyrite on partings.
815-824	9'	As above, but more massive.
824-826	2'	V.f.gr'd to silty, gry-grn ss, becoming f.gr'd to med.gr'd at base.
826-827	1'	F.gr'd to med. gr'd, lt. gray ss.
827-829	2'	Crse.gr'd, gray ss w. gry-grn laminations.
829-835	6'	Same as 826-827'.
835-836	1'	Same as above, but shows wk. radioactivity.
836		Chinlee-Moenkopi contact
836-841	5'	Mottled (purple-brn, yel-brn), altered silty sandstone and mudstone w. wk. pyrite, hematite.
841-843	2'	Brick-red siltstone.
843		Bottom of hole

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DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-U-11-12-D1
Date Spudded: 12/4/54 **Completed:** 12/6/54
Coordinates: North--30,140' East--30,348'

Drill Summary

	Depth	Elevation
Collar	0'	6043'
Base of Kayenta Fm.	235'	5808'
Base of Wingate Fm.	570'	5473'
Base of Chinlee Fm.	933'	5110'
Bottom of hole	941'	5102'

Mineralization

	Depth
Weakly mineralized, max. intensity of 790 counts/sec at 769'.	760-770'
Spot of wk. mineralization, max. intensity of 312 counts/sec. at 927'	927'
Very weak mineralization at Moenkopi contact. (Chem. assay: 10" - 0.011% U_3O_8) (" " : 1" - 0.05 % ")	933'

Geologic Log

Depth	Interval	Description
0-703	703'	Plug-bit drilled.
703-708	5'	F. gr'd to silty ss. Gray-green to red-purple. Wkly. laminated, few ½" clay shale inclusions. Laminae consist of gray-green clay, v. f. gr'd hematite and muscovite.
708-723	15'	Med. to crse-gr'd ss. Med to lt. gray w. scattered gray-green shale inclusions (5%).
723-726	3'	Med. to crse-gr'd ss. Reddish-gray w. 5% gray-green shale.
726-727	1'	F. gr'd to silty ss. Gray-green shale inclusions and minor carbon and FeS_2.
727-733	6'	Med. to crse-gr'd ss. Gray. Gray-green shale blebs (20%).
733-738	5'	Med. gr'd ss. Lt. gray. Massive.
738-745	7'	Med. to crse-gr'd ss. Lt. gray. Laminated. Laminae consist of dk. gray silty ss w. muscovite.
745-746	1'	Same as interval above w. carbon and pyrite in laminae. V. wk. to no radioactivity.
746-757	11'	Crse-gr'd ss. Med. to dk. gray. Minor gray-green shale blebs. Numerous frag'ts and thin partings of carbon, some pyrite.
757-759	2'	Gray-green clay shale. Sandy in lower potion.
759-767	8'	Med. gr'd ss. Lt. gray. Massive. Very calcareous.
767	½'	Carbon w. abundant pyrite or marcasite.
767-781	14'	Med. gr'd ss. Lt. gray. Gray-green shale inclusions, increasing in lower portion.

Hole 26-U-11-12-D1 (con)

Depth	Interval	Description
781-786	5'	Med. gr'd, lt. gray ss w. abundant gray-green shale inclusions, becoming shale-pebble conglomerate at base.
786-903	117'	Plug-bit drilled.
903-911	8'	Med. to crse-gr'd ss., lt. gray, wkly. laminated. Laminae of gry-grn clay and muscovite.
911-917	6'	Med-gr'd, lt. gray ss w. 5% gry-grn mudst.
917-920	3'	Same as above w. thin carbonaceous partings and wk. pyrite.
920-933	13'	Dense, gry-grn mudstone w. thin bands gry-grn silty ss. Wk. carbon and pyrite. V. wk. radioactivity.
933		Chinlee-Moenkopi contact
933-935	2'	Bleached and mottled (white, yellow-brn and purple), dense mudstone w. abundant minute crystals of FeS_2. Chemical Assay: 10" - 0.011% U_3O_8
935-941	7'	Brick-red mudstone and silty sandstone, locally bleached to lt. green.
941		Bottom of hole.

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DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-U-11-12-D2
Date Spudded: 12/6/54 **Completed:** 12/7/54
Coordinates: North--30,184' East--30,422'

Drill Summary

	Depth	Elevation
Collar	0'	6043'
Base of Kayenta Fm.	234'	5809'
Base of Wingate Fm.	570'	5473'
Base of Chinlee Fm.	930'	5113'
Bottom of hole	938'	5105'

Mineralization

	Depth
Spot very wk, mineralization. Max. intensity of 340 counts/sec.	740'
Spot very wk. mineralization. Max. intensity of 340 counts/sec.	929'

No chemical assays.

Geologic Log

Depth	Interval	Description
0-727	727'	Plug-bit drilled
727-752	25'	Not logged.
752-759	7'	Interbedded, med, to dk. gray mudstone and v.f.gr'd to silty, med, to lt. gray, wkly laminated ss.
759-767	8'	Med.gr'd, lt. gray massive ss, V. wkly calcareous. Lower 3' has occas. thin films carbon w. FeS_2 and gry-grn clay frag'ts.
767-900	133'	Plug-bit drilled.
900-913	13'	F. to med.gr'd, lt. gray, calcareous ss. Wkly to well laminated. Rare specks carbon.
913-919	6'	Med. to dk. gry mudstone w. 5% silty ss bands. Rare specks carbon.
919-924	5'	Alternating laminae of lt. gray, silty, calc. ss and med. gry mudstone. Numerous clay pebbles.
924-926	2'	Med. gry mudstone with carbon. films.
926-928	2'	V.f. gr'd, lt. gray, calc. ss.
928-929	1'	Gray-green, dense, mudstone.
929-930	1'	Gray-green, clay-pebble congl. w. 20% f. gr'd ss. Scattered frag'ts carbon and diss. FeS_2. V. Wk. radioactivity.
930		Chinlee-Moenkopi Contact
930-933	3'	Bleached and mottled (iron and manganese stained), reworked (?) mudstone.
933-938	5'	Brick-red, silty mudstone with small patches altered to lt. green.
938		Bottom of hole

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DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number 26-U-11-12-D3
Date Spudded: 12/8/54 **Completed:** 12/10/54
Coordinates: North--30,067' East--30,366'

Drill Summary

	Depth	Elevation
Collar	0'	6040'
Base of Kayenta Fm.	257'	5783'
Base of Wingate Fm.	570'	5470'
Base of Chinlee Fm.	925'	5115'
Bottom of hole	938'	5102'

Mineralization

	Depth
Chemical Assay: 0.1' - 0.019% U_3O_8	764'
Slightly mineralized, max. intensity of 480 counts/sec.	879'
V. weakly mineralized, max, intensity of 353 counts/sec.	891'
Highly mineralized, max. intensity of 3500 counts/sec. Estimated to be 0.5' of 0.13%	920-924'
Chemical Assay: 1.1'- 0.072% U_3O_8	925-926'

Geologic Log

Depth	Interval	Description
0-727	727'	Plug-bit drilled
727-728	1'	Med.gry mudstone, rare carbon.
728-738	10'	F. to med, gr'd., reddish gry-grn (abundant f.gr'd hematite), massive ss. Gray-green clay pebbles in upper 2' and similar pebbles with iron-stained rims scattered occas. thrwout.
738-740	2'	Same sandstone as above with abundant clay pebbles. Carbon seams at 740'.
740-745	5'	F. Gr'd, lt. gry-grn, massive ss, w. 5% grenn clay partings.
745-748	3'	Gray-green clay cngl in lt. gray, f. gr'd ss. 30% clay pebbles.
748-751	3'	F.gr'd, lt. gray, calc., massive ss.
751-752	1'	Same as above with thin films, frag'ts of carbon, diss. FeS_2, some bleby FeS_2.
752-761	8'	F. to med.gr'd, lt. gray, calc, ss. Generally massive, v. rare carbon.
761-764	3'	Same as above, laminated w. clay pebbles and partings. V. wk. carbon.
764-765	1'	F.gr'd ss w. 0.5' clay cngl. 1" of carbon, strong FeS_2 and wk. radio-activity at 764'. Assay: 1"-0.019%.
765-900	135'	Plug-bit drilled.
900-910	10'	F.gr'd, lt. gray, calc. ss. Wkly to well laminated. Rare specks carbon and thin carbonaceous laminae.
910-911	1'	Med.gr'd ss w. 5% clay partings.

Depth	Interval	Description
911-914	3'	Crse gr'd to grit, lt. gry-grn, laminated ss. Bk. laminations due to clay and carbon.
914-915.5'	1.5'	Dk. gray mudstone.
915.5-917'	1.5'	Silty, laminated ss w. mudstone bands.
917-919'	2'	Dk. gray mudstone.
919-923'	4'	Silty, gry-grn ss w. siltstone and mudstone bands. Occas. carbon and weak pyrite.
923-924'	1'	Med. to crse.gr'd, lt. gray ss. w. wkly diss. pyrite.
924-925'	1'	Dk. gray mudstone w. 1" crse.gr'd ss at base, containing red, radioactive chert.
925'		Chinlee-Moenkopi contact.
925-926	1'	Tan, altered, reworked (?) mudstone w. abundant red chert bands, diss. fine specks FeS_2, wkly radioactive.
926-930	4'	Bleached, mottled (red and purple-stained) lt. gray to cream mudstone.
930-938	8'	Brick-red, soft, mudstone, locally altered to lt. green
938		Bottom of hole.

DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-U-11-12-D4
Date Spudded: 12/10/54 Completed: 12-13-54
Coordinates: North--30,042' East--30,508'

Drill Summary

	Depth	Elevation
Collar	0'	6026'
Base of Kayenta Fm.	260'	5766'
Base of Wingate Fm.	558'	5468'
Base of Chinlee Fm.	911'	5125'
Bottom of hole	921'	5115'

Mineralization

	Depth
Mineralized, max. intensity of 740 counts/sec.	905'*
Highly mineralized, max. intensity of 1190 counts/sec. Estimated to be below 0.10%	911-918'*
Chemical Assays: 0.2' - 0.05% U_3O_8	911'
: 2.0' - 0.021% U_3O_8	911-913'

*There is a discrepancy between the drilled and probed footages which probably accounts for displacement of the mineralization in the core and in the probe record.

Geologic Log

Depth	Interval	Description
0-697'	697'	Plug-bit drilled.
697-704'	7'	F.gr'd to silty, gry-grn, laminated ss. Locally reddish due to abun. hematite, Muscovite and hematite laminae. 0.5' clay cngl at base.
704-706	2'	F. to med.gr'd, greenish, massive ss.
706-715	9'	F. to silty, gray-grn and reddish gry-grn, massive ss. Laminated in upper 2'. Specks hematite thruout.
715-720	5'	F. to med.gr'd, arkosic ss. Reddish-gry.
720-771	51'	Not logged in detail. Predominantly f.gr'd and silty ss.
771-773	2'	F.gr'd, gray ss with 1' of gry-grn clay-pebble cngl. Abund. carbon, v. wk. pyrite, x-line calcite.
773-776	3'	Siltstone and silty sandstone, gray-grn. with 1' gray mudstone at top.
776-778	2'	Gray-grn, calc. siltstone. Few clay pebbles and 0.5' gray mudstone at base.
778-790	12'	F. to med.gr'd, reddish gray to reddish purple ss, changing to gray in lower 2'. Generally massive, few laminated zones.
790-791	1'	Laminated, gray, micaceous silty ss.
791-795	4'	F. to med.gr'd, lt. gray, wkly laminated to massive ss.

26-U-11-12-D4 (con)

Depth	Interval	Description
795-801	6'	F. to crse.gr'd, lt. to med. gray, banded ss w. dk. bands (½-2") of clay, carbon, diss. FeS_2.
801-806	5'	Med. to crse,gr'd, gray ss w. 30% clay pebbles. Occas. specks carbon and wkly diss. FeS_2.
806-811	5'	Med to crse.gr'd ss w. abundant carbon and diss. to bleby pyrite
811-815	4'	F. to med.gr'd ss w. crse. clay pebbles. Rare small frag'ts carbon, pyrite.
815-819	4'	F. to med.gr'd ss, med, to dk. gray, siliceous w. scattered carbon, diss. pyrite. Wkly laminated. 20% dk. gry clay.
819-825	6'	Dk. gray, massive mudstone.
825-869	44'	Plug-bit drilled thru predominantly gray mudstone.
869-871	2'	Silty, gray, massive ss with v. minor gry-green clay.
871-885	14'	Med. to crse. gr'd, med. gray, laminated ss. w. 10% gray and gry-grn clay pebbles. V. wkly calcareous. Occas. frag'ts, layers carbon, rare FeS_2.
885-898	13'	F.gr'd to silty, lt. gray, massive ss and siltstone, wkly laminated in upper 5'.
898-899	1'	Alternating med.gr'd ss and gry-grn mudstone. Few crse, sand grains, few specks carbon.
899-910	11'	Dk. gray mudstone, few thin layers silty ss.
910-911	1'	Med. to crse.gr'd, gray ss w. numerous gry clay pebbles. 5% carbon, v. wkly diss. pyrite. 0.2' at base assayed 0.05%. V. wkly, calcareous.
911		Chinlee-Moenkopi contact.
911-912	1'	Bleached, mottled (red-brown, yellow-brn and black) mudstone w. abundant f. gr'd FeS_2, trace $CuFeS_2$ and red chert stringers. Fair radioactivity.
912-914	2'	Same mudstone as above, with diminishing pyrite.
914-921	7'	Same mudstone as above. Whitish gray color, stained with iron and manganese. No pyrite.
921		Bottom of hole.

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DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-U-11-12-D5
Date Spudded: 1/17/55 Completed: 1/21/55
Coordinates: North--29,982' East--30,398'

Drill Summary

	Depth	Elevation
Collar	0'	6020'
Base of Kayenta Fm.	145'	5875'
Base of Wingate Fm.	545'	5475'
Base of Chinlee Fm.	906'	5114'
Bottom of Hole	912'	5108'

Mineralization

	Depth
Mineralized, maximum intensity of 600 counts/sec.	899-901'
V. wkly mineralized, maximum intensity of 320 counts/sec.	935'
Chemical assay: 0.2' - 0.102% U_3O_8	906'

Geologic Log

Depth	Interval	Description
0-727	727'	Plug-bit drilled
727-729	2'	F.gr'd, lt. gray, massive ss.
729-732	3'	Dense, gray, shaley siltstone.
732-735	3'	F.gr'd to silty, lt. gry, laminated ss.
735-746	11'	F.gr'd, lt. gry, massive ss with scattered ¼" clay pebbles.
746-754	8'	F.gr'd ss, lt. gray and clay-pebble congl. Calcareous. Few small pieces carbon.
754-766	12'	Intercalated, thin layers of gry-grn siltstone, f.gr'd gry ss and shale. Wkly laminated.
766-780	14'	F.gr'd ss, lt. gry, massive. Locally laminated. Wkly calcareous.
780-875	95'	Plug-bit drilled.
875-877	2'	F.gr'd, lt. gry ss w. thin layers carbon, wkly diss. pyrite and bleby pyrite. 10% lt. green clay pebbles.
877-881	4'	F.gr'd ss and siltstone, gray-green.
881-895	14'	F.gr'd, lt. gray ss. Generally massive, but thin zones wkly laminated. Laminae are green clay with wk. carbon. At 893, 2" of carbonaceous stringers w. diss. and bleby pyrite.
895-897	2'	Silty sandstone, gray, massive. Wkly calc.
897-900	3'	F.gr'd, lt. gray, laminated ss. In part, silty, with carbonaceous partings.
900-902	2'	Siltstone, gray-green, massive w. thin zones med. gr'd ss. Wk carbon.
902-903	1'	F.gr'd, lt. gry ss. Calcareous. Carbon frag'ts w. wk. pyrite.
903-906	3'	F. to crse-gr'd ss and f. congl. w. abundant clay pebbles. Calcareous. Abundant frag'ts carbon w. diss. and bleby pyrite. 0.2' at base has moderate radioactivity, assayed 0.102% U_3O_8.

Depth	Interval	Description
906		Chinlee-Moenkopi contact
906-912	6'	Bleached, mottled mudstone and silty sandstone. Diss. pyrite in upper 2'.
912		Bottom of hole

****

DRILL LOG

Project Name: BIG FLAT UNIT
Hole Number: 26-U-11-13-D1
Date Spudded: 1/23/55 Completed: 2/1/55
Coordinates: North--30,064' East--30,778'

Drill Summary

	Depth	Elevation
Collar	0'	6046'
Base of Kayenta Fm.		
Base of Wingate Fm.	594'	5452'
Base of Chinlee Fm.	929'	5117'
Bottom of hole	933'	5113'

Mineralization

	Depth
Highly mineralized, max. intensity of 2480 counts/sec.	914-917'
Highly mineralized, max. intensity of 1520 counts/sec.	920-922'
Chemical Assay: 2.0' - 0.035%	914.5-916.5'
0.2' - 1.586%	924'
2.0' - 0.047%	924-926'

Geologic Log

Depth	Interval	Description
0-720	720'	Plug-bit drilled
720-730	10'	F.gr'd, lt. gray-brn, massive ss w. numerous brn shale inclusions in lower 5'
730-736	6'	Same as above, without shale fragments.
736-741	5'	Same as above with frag'ts and thin zones of brown shale.
741-750	9'	F.gr'd, lt. gry-brn ss, somewhat calcareous and silty.
750-757	7'	Same ss as above, but gry-grn in color.
757-880	123'	Plug-bit drilled
880-887	7'	F.gr'd to silty, lt. gray, wkly calc. ss.
887-890	3'	Same as above, laminated.
890-896	6'	F.gr'd, lt. gray, massive ss.
896-898	2'	Same as above, with numerous gry clay inclusions.
898-919	21'	F. to crse.gr'd, lt. gray, calcareous ss. Scattered, small frag'ts carbon.
919-921	2'	Gray-green, massive siltstone. Lower 1' sandy, laminated.
921-926	5'	F.gr'd to med. gr'd., lt. gray ss. Wkly laminated. At 924, 0.2' carbon frag't with diss. pyrite, high radioactivity.
926-928	2'	Gray-green mudstone w. specks carbon.
928-929	1'	Crse.gr'd ss w. carbon, red chert stringers, diss. fine pyrite. Counts 3x background.
929		Chinlee-Moenkopi contact
929-933	4'	Brick-red and purple mudstone and siltstone. Locally altered to lt. green.

****

EXHIBIT B

MINING LEASE

This Agreement made and entered into this 29th day of November, 1974, by and between THE GLEN ROSE MINING CORP., a Delaware corporation, hereinafter called "Lessor", and STANLEY B. GRANT, Agent, of New York City, New York, hereinafter called "Operator".

W I T N E S S E T H:

WHEREAS, Lessor warrants that the unpatented lode mining claims located and recorded in Grand County, State of Utah, and more particularly described in Schedule A attached hereto and made a part hereof, to which reference is hereby made for all purposes hereof, are subject only to a ten per cent (10%) expense-free royalty reserved to the original owners thereof and are not encumbered by any contracts with any other parties, and states that to the best of its knowledge it holds possessory title free and clear of any obligation to any other parties, and has not granted any unbelieved contracts to others, and does not hold said claims as trustee for others. Each of said claims and the lands covered thereby as herein referred to as the "the leased premises"; and

WHEREAS, Operator in entering into this Agreement is acting as Agent for certain individuals and not as a principal, and all references herein to Operator are intended to mean and shall be limited to Operator as such Agent; and

WHEREAS, Operator desires to lease the premises hereby demised and Lessor is willing to lease the same to Operator for the consideration and subject to the terms, conditions, covenants and provisions herein contained;

NOW, THEREFORE, in consideration of the mutual covenants herein contained and of other good and valuable consideration, receipt thereof is hereby acknowledged, it is agreed between the parties hereto as follows:

1. Lessor does hereby lease and demise unto Operator all of its right, title and interest in and to each of the claims covering the leased premises and

listed in Schedule A annexed hereto and all of its rights thereunder, subject, however, to the ten percent (10%) expense-free royalty originally reserved by the prior owners thereof, as hereinabove set forth, which royalty Operator hereby assumes and agrees to pay, TO HAVE AND TO HOLD unto Operator for a term of ten years from the date hereof and thereafter for so long as Operator shall with reasonable diligence operate the leased premises for the purpose of mining or of exploring the same, or until this lease is terminated or forfeited through the violation of any covenant hereof to be performed by Operator as herein provided, with right of Operator to surrender as set forth below.

2. Operator agrees that he will with reasonable dispatch enter upon the leased premises and commence exploration work thereon, including surface and annual assessment work, by drilling, drifting or other means as in the judgment of Operator will be the most economical and effective way to explore the leased premises, provided, however, that Operator agrees to and will expend not less than $150,000 in pursuance of such exploration work. The term "exploration work", as used herein, shall mean and include all activities up to the point of preparing for underground entry. In the event minerals are in commercial quantities is revealed by such exploration work, Operator agrees to start mining operations within a reasonable time and thereafter to continue mining so long as commercial ore may be reasonably obtained, provided, however, that nothing shall be deemed to obligate Operator to continue mining operations if in his opinion economic factors do not justify such operations.

3. Operator shall have the right at any time and from time to time to surrender this lease or to surrender any portion of the leased premises to Lessor by giving Lessor thirty days' written notice thereof and thereupon Operator shall have no further duties or obligations hereunder with respect to the portion of the leased premises so surrendered, provided, however, that no

such surrender shall reduce or in any way affect the obligations of Operator hereunder to expend at least the sum of $150,000 for exploration work on the leased premises as aforesaid. If a portion of the leased premises be so surrendered, then this lease shall remain in force according to its terms as to the retained portion of the leased premises, the leased premises or such retained portion at any time then held by Operator hereunder, as the case may be, being herein referred to as the "retained acreage".

4. After Operator shall have expended the sum of $150,000 (or the lesser sum permitted by the provisions of paragraph 5(b) (ii) hereof) for exploration work on the leased premises, Lessor shall have the right, subject to the provisions of paragraph 5(b) (i) hereof, for a period of thirty days after Operator shall have notified Lessor of the completion of the expenditure by Operator of said sum, to acquire, without cost to it but subject to its proportionate share of the ten percent (10%) expense-free royalty above referred to, an undivided one-sixth (1/6) interest in the retained acreage by giving Operator written notice of such election within said period; provided, however, that in the event Operator, prior to the completion of the expenditure by him of said sum, notifies Lessor of the discovery on the retained acreage of minerals are in commercial quantities and his intention to prepare for underground entry as contemplated by paragraph 2 above, then Lessor shall have the right, for a period of ninety days after receipt of such notice, to acquire an undivided interest in the retained acreage as aforesaid. If Lessor shall fail to give Operator notice of its election to exercise such right within either of said periods, then, upon expiration of the particular period, Lessor shall have no further right, option or privilege to acquire any such interest in the retained acreage, either before or after the completion of the expenditure by Operator of said sum. Nothing contained in this paragraph 4 shall reduce or in any way

affect the obligations of Operator hereunder to expend said sum for the exploration of the retained acreage as aforesaid. In the event that Lessor elects to acquire such interest, the parties hereto agree them to execute such assignments, conveyances or other instruments as may be appropriate and necessary to effectuate such acquisition by Lessor and to provide for the joint development, including the financing thereof, whether through borrowing or otherwise, and operation of the properties.

5. In the event of failure of title to all or any part of the retained acreage: (a) if Lessor shall then have acquired an interest in such retained acreage, such failure of title shall constitute a common loss and shall be borne by the parties hereto proportionately; (b) if Lessor shall not then have acquired an interest in such retained acreage, then (i) the right of Lessor to acquire an undivided one-sixth (1/6) interest in the retained acreage as above in paragraph 4 provided shall be abated and reduced to the end that such failure shall constitute a common loss to be borne by the parties hereto proportionately and that Lessor shall have the right to acquire only such undivided fractional interest in the said portion of the retained acreage affected by the failure of title as will properly reflect such common loss, and (ii) the obligation of Operator hereunder to expend at least the sum of $150,000 as hereinabove set forth shall be reduced in proportion to such failure of title; i.e., a fifty percent (50%) failure of title affecting ten percent (10%) of the retained acreage shall occasion a five percent (5%) reduction in such obligation of Operator.

6. So long as this lease may be in effect, Operator shall cause to be performed, within the time prescribed by law, and at the joint expense of the parties hereto in proportion to their respective interests from time to time in the retained acreage, such annual assessment work as may be required for the retention of possessory rights in and to the retained acreage, or any mining leases applicable thereto, and Operator shall make and file an affidavit so showing, beginning with the assessment year ending June 30, 1955. The amounts expended by Operator for

such work shall be included in computing the expenditures of Operator in fulfilling his obligation hereunder to expend at least $150,000 in pursuance of exploration work on the retained acreage.

7. Operator shall keep full and accurate records of all operations carried on hereunder, including drilling records, maps and assays, open to inspection of Lessor, or its agent, at all reasonable times, and shall permit Lessor, or its agent, full and free access to the leased premises for inspection or other proper purpose.

8. With respect to the retained acreage, prior to the acquisition by Lessor of any interest therein, Operator shall save and keep harmless Lessor from any and all liability of every kind and character arising out of the conduct of his mining operations, and shall carry or cause to be carried Workmen's Compensation Insurance, and Operator shall pay Federal and State taxes imposed upon his operations hereunder.

9. Until such time as Lessor shall have acquired an undivided one-sixth interest in the retained acreage as aforesaid, Operator shall post notices upon the leased premises, reciting in substance that all operations are being carried on and conducted by Operator, and Lessor shall not be liable for any claims or acts of any kind or character arising out of Operator's work hereunder.

10. Upon violation by Operator of any of his covenants herein, Lessor shall have the right to terminate this lease by written notice to Operator, and no termination or forfeiture of or under this lease shall ever except upon such written notice. Any notice by Lessor electing to terminate this lease as to any portion of the leased premises shall state with particularity the substantial facts giving rise to such notice. Operator shall have thirty days after receipt of such notice within which to cure any default, breach or failure, but if Operator shall fail to cure such default, breach or failure within such time, this lease shall expire as to such portion of the leased premises and Lessor shall thereupon be entitled to possession of such portion. All notices required,

permitted or given hereunder shall be by registered mail, effective upon the posting thereof, directed to the last known business address of the party being notified, or to such other address as such party may have most recently requested by written notification. It is expressly agreed that Lessor's right to terminate shall be its sole and exclusive remedy for any breach by Operator of any covenant herein, and Lessor does hereby expressly waive and forego any other claim, action, right or remedy, provided, however, that Operator shall continue to remain liable to Lessor for all accrued and unpaid obligations owing hereunder.

11. Upon any relinquishment of property from this lease or upon any termination or surrender of this lease, Operator, provided he is not in default hereunder, shall have the right within a reasonable time to remove all of his machinery, equipment and other personal property, including buildings, structures; and any chattels affixed or attached to the realty, it being agreed that the title thereto shall at all times remain in Operator.

12. After the acquisition by Lessor of an interest in the retained acreage as aforesaid, then, anything herein contained to the contrary notwithstanding, all costs, payments, expenses, duties and obligations with respect to the operation of the retained acreage and the proper exploration and development thereof shall be borne by the parties hereto in proportion to their respective interests from time to time therein.

13. Subject to the reasonable approval in writing of Lessor as to the financial responsibility of any assignee, transferee or sublessee, Operator may assign or transfer this lease in whole or in part and may sublease all or any portion of the property hereinabove described, provided such sublease is made subject to the provisions herein contained, and provided further, that no such assignment or transfer or sublease shall relieve Operator or any subsequent assignee, transferee or sublessee of any of his or its obligations hereunder. Lessor may assign or otherwise transfer this lease or all or a fractional part

of its rights hereunder, provided, however, that any such transfer or assignment shall contain an appropriate provision effectively designating a single person, firm or agent to act as agent with respect to all its rights and obligations hereunder and to receive any notice served by Operator hereunder. Operator shall not be required to give any notice or to make any payment other than to such agent, which shall be as effective as if given or paid hereunder directly to each party in interest. Subject to the foregoing provisions of this paragraph, the provisions hereof shall inure to the benefit of and be binding upon the heirs, representatives, successors and assigns of the respective parties and upon the principals for whom Operator is acting as Agent.

IN WITNESS WHEREOF the parties have affixed their hands and seals the day and year first above written.

LESSOR:

THE GLEN ROSY URANIUM CORP.

By _____
President

ATTEST:

_____
Secretary

OPERATOR:

_____
Stanley R. Grant, Agent

SCHEDULE A

"THE LEASED PREMISES"

Claims	R 10E, T25S
12	Section W-29 Claims No. 1-2-3-16-17-18-19-20-21-34-35-36
8	Section W-28 Claims 8-9-10-11-26-27-28-29
17	Section W-32 Claims 1-2-3-4-5-6-7-8-9-15-16-17-18-19-20-21-22
4	Section W-33 Claims 8-9-10-27
	Twp. 26S R19E
16	Section W-3 Claims 1-2-3-4-5-6-7-8-9-16-17-18-19-20-21-22
4	Section 26-U-4 Claims 9-10-11-27
14	Section W-8 Claims 1-2-3-4-17-18-19-20-21-22-33-34-35-36
6	Section 26-U-9 Claims 9-10-11-12-27-28
12	Section W-6 Claims 15-16-17-18-19-20-21-22-33-34-35-36
	Twp. 26S R18E
8	Section W-1 Claims 1-2-3-4-13-14-15-16
	Twp. 26 South R 19 East
9	Section 26-U-2 Claims 19-20-21-22-23-24-25-26-27
27	Section 26-U-11 Claims 1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27
3	Section 26-U-3 Claims 17-18-19-20-21-22-23-24
24	Section 26-U-10 Claims 1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24

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EXHIBIT B

AMENDMENT TO PARMENT AGREEMENT

This Agreement made and entered into this 22nd day of March, 1955, by and between THE ELDE MINI URANIUM CORP., a Delaware corporation (hereinafter called "Lessor"), and STANLEY R. GRANT, Agent, of New York City, New York (hereinafter called "Operator"),

W I T N E S S E T H :

WHEREAS, the parties hereto have heretofore entered into an Agreement dated November 22, 1954 (hereinafter called the "Parment Agreement"), whereunder certain unpatented lode mining claims located and recorded in Grand County, Utah, and more particularly described in Schedule A attached to the Parment Agreement were leased and demised unto Operator in accordance with and subject to all the terms, conditions and provisions of the Parment Agreement; and

WHEREAS, the parties hereto desire to amend the Parment Agreement to bring other and additional unpatented lode mining claims, also located in Grand County, Utah, within the scope, purview and purposes of the Parment Agreement and to provide for the lease and exploration thereof and the expenditure of funds thereon; and

WHEREAS, Lessor warrants that the unpatented lode mining claims located and recorded in Grand County, Utah, and more particularly described in Exhibit I annexed hereto and made a part hereof, to which reference is hereby made for

all purposes hereof, are subject only to a 10% expense-free royalty reserved to the original owners thereof and are not encumbered by any contracts with any other parties and states to the best of its knowledge it holds possessory title free and clear of any obligation to any other parties and has not granted any unrelated contracts to others and does not hold said claims as trustee for others; and

WHEREAS, Operator in entering into this Agreement is acting as Agent for certain individuals and not as a principal, and all references herein to Operator are intended to mean and shall be limited to Operator as such Agent; and

WHEREAS, Operator desires to lease the premises hereby demised and Lessor is willing to lease the same to Operator for the consideration and subject to the terms, covenants and provisions herein contained;

NOW, THEREFORE, in consideration of the mutual covenants herein contained and of other good and valuable consideration, receipt thereof is hereby acknowledged, it is agreed between the parties hereto as follows:

1. The Farmout Agreement shall be and is hereby amended, modified and changed in the following respects:

(a) The term "leased premises", wherever used in the Farmout Agreement and herein shall mean and include the unpatented lode mining claims

described in Exhibit I annexed hereto, as well as the unpatented lode mining claims described in Schedule A attached to the Farmout Agreement, to the same extent and with the same intent and purpose as if all of said claims had originally been listed and described in said Schedule A, and, subject to all the terms, conditions and provisions of the Farmout Agreement and of this amendment thereto and to the royalty above referred to, Lessor does hereby lease and demise unto Operator all of its right, title and interest in and to each of said claims and the lands covered thereby and all of its rights thereunder, to have and to hold unto Operator as provided in the Farmout Agreement as amended hereby.

(b) The right of Lessor under the Farmout Agreement to acquire up to an undivided one-sixth (1/6th) interest in the leased premises or in the "retained acreage" as therein defined, shall be and hereby is changed so that wherever the words or figures "one-sixth (1/6th)" appear therein, they shall be and read "one-fourth (1/4th)" and Lessor's

right to acquire up to said one-fourth (1/4th) interest in the retained acreage shall apply equally to the claims and lands originally leased to Operator under the Farmout Agreement as well as to the claims and lands leased to him pursuant to the provisions hereof.

(c) The lands on which Operator is obligated, to the extent set forth in and pursuant to the terms, conditions and provisions of the Farmout Agreement, to expend the sum of One Hundred and Fifty Thousand Dollars ($150,000) shall include all of the leased premises; i.e., all of the lands leased to Operator and included in the Farmout Agreement pursuant to the provisions hereof and of the Farmout Agreement.

2. In all other respects, the parties hereby ratify, restate and confirm all of the terms, covenants, conditions and provisions of the Farmout Agreement, to the same extent as if the same had been set forth in full herein. Regardless of the date of actual execution hereof by the parties hereto, this Agreement shall be effective as of the 29th day of November, 1974, and shall be binding upon the heirs, representatives, successors and assigns of the respective parties and upon the principals for whom Operator is acting as Agent.

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

LESSOR:

THE GLEN ROCK URANIUM CORP.

By _____
President

ATTEST:

_____
Secretary

OPERATOR:

_____
Stanley R. Grant, Agent

EXHIBIT I

Claims	Tyn. 26S R18E
8	Section 26 U-10 Claims 25-26-27-28-29-30-31-32
8	Section 26 U-13 Claims 1-2-3-4-5-6-7-8
9	Section 26 U-11 Claims 28-29-30-31-32-33-34-35-36
9	Section 26 U-14 Claims 1-2-3-4-5-6-7-8-9
27	Section 26 U-25 Claims 1-2-3-4-5-6-7-8-9-10 11-12-13-14-15-16-17-18-19- 20-21-22-23-24-25-26-27
24	Section 26 U-26 Claims 1-2-3-4-5-6-7-8-9-10- 11-12-13-14-15-16-17-18-19- 20-21-22-23-24
27	Section 26 U-27 Claims 1-2-3-4-5-6-7-8-9-10 11-12-13-14-15-16-17-18-19- 20-21-22-23-24-25-26-27

TIE

STANLEY R. GRANT
42 Wall Street
New York, N. Y.

EXHIBIT D

CLAIM RECORDING DATA

Claim Name	Book	Page	County
26-U-10-1	47	368	Grand Co.
-2	47	369	"
-3	47	370	"
-4	47	371	"
-5	47	372	"
-12	47	403	"
-13	47	404	"
-14	47	405	"
-15	47	406	"
-16	47	407	"
-17	47	410	"
-18	47	411	"
-19	47	412	"
-20	47	413	"
-21	47	414	"
-22	47	415	"
-23	47	416	"
-24	47	417	"
-25	47	444	"
-26	47	445	"
-27	47	446	"
-28	47	447	"
-29	47	448	"
-30	47	449	"
-31	47	450	"
-32	47	451	"
26-U-11-5	52	189	"
-6	52	190	"
-7	52	191	"
-8	52	192	"
-9	47	367	"
-10	47	408	"
-11	52	193	"
-12	52	194	"
-13	52	195	"
-14	52	196	"
-15	52	197	"
-16	52	198	"
-17	52	199	"
-18	52	200	"
-19	52	201	"
-20	52	202	"
-21	52	203	"
-22	52	204	"
-23	52	205	"
-24	52	206	"
-25	52	207	"
-26	52	208	"

STANLEY R. GRANT
42 Wall Street
New York, N. Y.

CLAIM RECORDING DATA-2

Claim Name	Book	Page	County
26-U-11-27	47	409	Grand Co.
-28	47	452	"
-29	52	209	"
-30	52	210	"
-31	52	211	"
-32	52	212	"
-33	52	213	"
-34	52	214	"
-35	52	215	"
-36	52	216	"
26-U-15-1	47	454	"
-2	47	455	"
-3	47	456	"
-4	47	457	"
-5	47	458	"
-6	47	459	"
-7	47	460	"
-8	47	461	"
26-U-14-1	53	70	"
-2	53	71	"
-3	53	72	"
-4	53	73	"
-5	53	74	"
-6	53	75	"
-7	53	76	"
-8	53	77	"
-9	47	453	"

Total number of claims--75

7/5/55 glu

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

224 New Customhouse
Denver 2, Colorado

June 27, 1955

Memorandum

To: Chairman, Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Report of Examination, DMEA Docket 3791 (Uranium), Stanley R. Grant, Agent, (Big Flat claims), Grand County, Utah

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

We concur in the recommendation of the field examiners that the application be denied.

DMEA Field Team, Region III

W. M. Traver

E. N. Harshman

Enclosures

DMEA
Date Rec'd
JUN 20 1955

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BUREAU OF MINES

TRANSMITTED
JUN 27 1955

Region III

Building 20, Room 1575
Denver Federal Center
Denver 2, Colorado
June 20, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shaw

Subject: DMEA 3791 (Uranium), Big Flat claims, Stanley R. Grant, Agent, Grand County, Utah

Enclosed are the original and eleven copies of a "Summary, Conclusions, and Recommendations" by Donald Haynes, geologist, and Glen Walker, mining engineer and the original and eleven copies of an engineering report by Glen Walker covering docket DMEA 3791.

Stanley R. Grant, Agent, applied for Government assistance in the amount of $119,147.50 to explore the Big Flat claims by approximately 26,825 feet of drilling. A field examination was made on May 25, 1955, by Donald Haynes of the Geological Survey and Glen Walker of the Bureau of Mines. The examining team concluded that there was little possibility of making a significant discovery of uranium as the result of the proposed work.

It is recommended that the application for assistance be denied.

JOHN F. SHAW

John F. Shaw
Supervising Mining Engineer

Enclosures

cc 11
DMEA 3791
Chron

JFS/cm

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

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DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 3791, Big Flat Claims

Stanley R. Grant

Grand County, Utah

Uranium

Donald Haynes, Geologist
Geological Survey

Glen Walker, Mining Engineer
Bureau of Mines

June 17, 1955

DMEA 3791

BIG FLAT CLAIMS
STANLEY R. GRANT
GRAND COUNTY, UTAH

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Summary, Conclusions, and Recommendations

By Donald Haynes
Geologist
Geological Survey

Glen Walker
Mining Engineer
Bureau of Mines

TRANSMITTED
JUN 27 1955

DMEA 3791

BIG FLAT CLAIMS
STANLEY R. GRANT
GRAND COUNTY, UTAH

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SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Donald Haynes and Glen Walker

Stanley R. Grant, agent, of 42 Broadway, New York City, requested Government assistance in the exploration for uranium ore on approximately 1,500 acres in Grand County, Utah. He proposed 26,825 feet of drilling in 29 holes, which was estimated to cost $119,147.50.

A DMEA field examination was made on May 25, 1955, by Donald Haynes of the U. S. Geological Survey and Glen Walker of the U. S. Bureau of Mines, in company with E. H. Kakland, Jr., representative of Mr. Grant.

It was concluded that the probability of making a significant discovery was meager, based on the evidence presented and the observations made.

It is recommended that the application for assistance be denied.

DMRA 3791

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BIG FLAT CLAIMS
STANLEY R. GRANT
GRAND COUNTY, UTAH

Engineering Report

By Glen Walker
Mining Engineer
Bureau of Mines

DMEA 3791

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BIG FLAT CLAIMS
STANLEY R. GRANT
GRAND COUNTY, UTAH

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Engineering report

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History, production and ownership	2
Description of deposits	3
Mineable ore reserves	3
Present status	3
Project proposals	4
Conclusions	5
Recommendations	5

DMEA 3791

BIG FLAT CLAIMS
STANLEY R. GRANT
GRAND COUNTY, UTAH

ENGINEERING REPORT

By Glen Walker

INTRODUCTION

Stanley R. Grant made application for Government assistance in the exploration of uranium ore on approximately 1,500 acres averaging a portion of the Big Flat in the Inter-river area, Grand County, Utah. The work outlined in the application consisted of 19 Stage I and 10 Stage II holes, 925 feet deep, making a total footage of 26,825 feet. The Stage I drilling was to be arranged in 5 rows of 3 and 4 holes each across what was assumed to be a channel. Stage II holes were to offset first stage mineralized holes. All holes were to be plug drilled to within 50 feet of the bottom and then cored. It was estimated the project would cost $119,147.50.

An examination of the property was made on May 25, 1955, by a Region III DMEA examining team.

ACKNOWLEDGMENTS

E. H. Eakland, Jr., of Uranium Engineering Co., Salt Lake City, Utah, geologic consultant for Mr. Grant accompanied the examining team and offered information on the subject and neighboring lands.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The land mentioned in the application includes parts or all of sections 2, 3, 10, 11, 14 and 15, T. 26 S., R. 19 E., Salt Lake base meridian on Big Flat, Grand County, Utah. It is readily accessible. From U. S. Highway 160 at a point 11 miles north of Moab, Utah, turn west up Seven Mile Canyon for about 15 miles. Thompsons, Utah, the nearest railpoint, is about 40 miles northeast of the property.

Big Flat, on which the property is located, is the top of the large mesa between the Green and the Colorado rivers and is a very gently rolling plain sparsely covered by small cedar and pinon. Little or no water for drilling or mining is available in the vicinity. Labor could be recruited in Moab, about 25 miles away. Power for any type operation would have to be furnished by internal-combustion engines. The 6 to 10 inches of precipitation falls during violent storms of both summer and winter.

HISTORY, PRODUCTION AND OWNERSHIP

Tidewater Associated Oil Co. drilled a wild-cat well on the property in 1947, the radiometric log of which showed weak anomalies. Likewise three oil tests by Glen Ruby and the King Oil Co. had slight shows of uranium mineralization. In late 1954, the applicant drilled 27 holes, 14 of which were on the subject land. Of these, 8 cored material assaying from .03 percent U_3O_8 4 feet thick to 1.59 percent U_3O_8.2 feet thick.

No production of uranium ore has been made from the property.

A search of the Grand County records indicates the applicant has a claim to the land mentioned.

DESCRIPTION OF DEPOSITS

The exposed rocks on the property consist of the Jurassic Kayenta, a reddish-brown sandstone with some shale lenses. Drill hole date indicate that the Jurassic Wingate sandstone occurs under the Kayenta. Beneath the Wingate the Triassic Chinle is made up of two recognizable units; the upper is mostly reddish brown to purple siltstone, the lower is fine sandstone with interlayered gray mudstone. At the base of the Chinle there is usually 1 to 3 feet of conglomerate sandstone and clay pebbles which contains the principal uranium mineralisatinn found. The Triassic Moenkopi, a reddish brown sandy shale, is separated from the overlying Chinle by an erosional unconformity.

MINEABLE ORE RESERVES

Present information about the property indicates there are no mineable ore reserves.

PRESENT STATUS

The applicant has drilled 14 holes on the property ranging in depth from 843 to 941 feet. All of these holes were plug-bitted to the lower Chinle horizon where uranium mineralization was expected then cored through that horizon. The cores were scanned by Geiger counter and where sufficient count occurred they were split and analysed

chemically. Indications of uranium ore ranging from 4 feet of .03 percent U_3O_8 to .2 feet of 1.59 percent U_3O_8 were found in 8 of the 14 holes. The applicant submitted a map showing contours on the base of the Chinle under a portion of the property. From this data he concluded that a channel having about 7 feet of relief had been found; but from the location of the holes it might be interpreted that it was merely a local depression with a roughly circular shape. Further it was pointed out to the applicant's field representative that a channel with no more than 7 feet of relief was considered insufficient to accommodate an ore deposit of ample dimensions to warrant prospecting for it with 900 feet holes.

No mining or milling equipment is on the ground and as far as is known the applicant has none. His intent was to contract the exploratory drilling.

PROJECT PROPOSALS

The applicant proposed to drill 19 Stage I holes 925 feet deep in rows ranging from 500 - 1,800 feet apart crosscutting the assumed channel. The holes in the rows were to be 100 - 150 feet apart. As a second stage ten 925-foot holes were proposed but their locations were not designated as they were to offset Stage I mineralized holes. It was estimated that 20 days would be required to build roads to drill sites. The project as outlined by the applicant was estimated to cost $119,147.50, which is somewhat excessive.

Because Government participation in exploratory work on this property is not recommended no cost estimate of a proposal will be included in this report.

CONCLUSIONS

The main object to any exploration of this property for uranium ore is the depth at which the most favorable mineralized horizon lies, 840 to 940 feet. Second, the evidence presented of a channel or place of ore deposition of sufficient size to warrant exploration is not convincing. Third, although there are no outcrops of the basal Chinle on the property there are two or three Chinle deposits being exploited within a radius of 5 to 6 miles, none of which apparently contains over a few hundred tons of medium to low grade ore.

Based upon present information the geologic habit of ore deposition in the Chinle formation of the area does not warrant the expenditure necessary for its exploration.

RECOMMENDATIONS

It is recommended that the application for Government assisted exploration of the property be denied.

/cm

RECEIVED
JUL - 1 1955

IN REPLY REFER TO:

DMEA
Date Rec'd.
JUN 21 1955

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

BUREAU OF MINES
Denver, Colorado

June 20, 1955

TRANSMITTED
JUN 27 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3791 (Uranium), Stanley R. Grant, Agent, Big Flat Unit, Grand County, Utah

Enclosed are 10 copies of a geologic report by D. D. Haynes, U. S. Geological Survey, covering his examination of the subject property.

Estimated drilling depths to the favorable ore horizon are in excess of 900 feet.

Haynes concludes that the Moss Back channel found by previous drilling may be too shallow to contain significant uranium deposits, and at best, deposits containing from 600 to 700 tons of high lime ore might be found by exploration on the claims. He, therefore, recommends denial of the application for exploration assistance.

I concur with this recommendation.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (10)

ENHarshman:arh

MINERAL DEPOSITS
DMEA
RECEIVED
JUN 17 1955
U. S.
GEOLOGICAL SURVEY
DENVER, COLORADO

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

June 15, 1955

Memorandum

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

RECEIVED
JUL - 1 1955

From: J. William Hasler

Subject: DMEA 3791, Stanley R. Grant, Agent, Big Flat Unit, (Uranium) Grand County, Utah

Transmitted herewith are 12 copies (one of which is to be transmitted to John F. Shaw, U. S. Bureau of Mines) of a geologic report by D. D. Haynes, covering a field examination of the above-referenced property, made May 25, 1955.

Mr. Haynes concludes that because of the great drilling depths and the possibility of mineralized deposits being no larger than 600 to 700 tons, and that the channel in the Moss Back member in the area appears to be too shallow, there is only a small chance of finding mineralized deposits that can be profitably mined. He, therefore, recommends that DMEA assistance be denied. I concur with his recommendations in view of the fact that if deposits were found as results of this work, they would not appreciably increase the Government's supply of uranium.

This application has been brought to the attention of the Exploration Division, U. S. Atomic Energy Commission, Grand Junction Operations Office and the AEC has been asked for help and advice in evaluating the subject property.

We are returning tne brochure covering this application.

D. D. Haynes for
J. William Hasler,
Geologist

JWH/mlr
Enclosures

UNITED STATES DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

RECEIVED
JUL - 1 1955

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

DMEA 3791, Stanley R. Grant, Agent, Big Flat Unit
Grand County, Utah

Uranium

Geologic Report

by

D. D. Haynes
U. S. Geological Survey

June 17, 1955

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DMEA 3791

INTRODUCTION

Stanley R. Grant, Agent, 42 Wall Street, New York City, N. Y., has applied for Government assistance (DMEA docket No. 3791) to explore for uranium in the Chinle formation, Big Flat area, Green River District, Grand County, Utah.

The applicant, Stanley R. Grant, Agent, proposes to explore 41 claims in secs. 29, 23, and 32 of T. 25 S., R. 19 E., 52 claims in secs. 4, 5, 6, and 9, of T. 26 S., R. 19 E.; 8 claims in sec. 1 of T. 26 S., R. 18 E., and 68 claims in secs. 2, 3, 10 and 11, of T. 26 S., R. 19 E. with a maximum of 26,825 feet of diamond drilling at a total cost of $119,147.50.

The claims may be reached from Moab, Utah, by traveling 11 miles north on U. S. Highway 160, then 15 miles west over the Seven-Mile Canyon road to the claimed area.

The property was examined on May 25, 1955, by a Region III examining team composed of Glen Walker of the U. S. Bureau of Mines, and D. D. Haynes of the U. S. Geological Survey. The examining team was accompanied by E. H. Eakland, Jr., consulting geologist and a representative of the applicant, and James Ruby, a nephew of Glen Ruby, the Lessor.

The writer conferred with W. Y. Isachsen and O. M. McRae of the U. S. Atomic Energy Commission, Exploration Division, on May 23, for the purpose evaluating the property.

GEOLOGY

The rocks exposed in the vicinity of the claimed area are, in descending order, the Jurassic Navajo sandstone, a fine- to medium-grained yellowish white, pale buff or buff brown sandstone containing sparse thin limestone beds, and the Jurassic (?) Kayenta formation, predominantly a fine-grained sandstone with small amounts of shale and limestone mostly near the top. The thickness of the underlying Kayenta ranges from 100 to 300 feet. The Navajo sandstone is present only on small widely scattered buttes and is about 100 feet thick.

The Triassic Wingate formation underlies the Kayenta formation and ranges from 310 to 350 feet in thickness. The Wingate formation is a fine-grained, light-buff, massive, quartzitic sandstone that forms sheer cliffs.

The Triassic Chinle formation underlies the Wingate formation. The Chinle formation ranges from 345 to 400 feet thick. The upper 100 to 150 feet is dominantly red silty sandstone and shale. The lower 200 to 300 feet is dominantly a gray fine-grained sandstone containing numerous beds of gray and gray-green mudstone. The sandstone units contain carbonized wood and trash pockets. There are numerous limestone-pebble and clay-pebble lenses throughout the lower units.

The Triassic Moenkopi formation underlies the Chinle formation. It consists of chocolate-brown or brick-red siltstone and mudstone. The upper 2 to 5 feet shows bleaching and contains small amounts of radioactive chert. It corresponds to Finch's "purple white" band in the lower Chinle (Moss Back member). 1/

Structurally the area lies along the axis and southwest flank of the Cane Creek Anticline, a broad, gentle arch trending northwesterly across the Big Flat area. AEC drilling suggests that the axis of the Cane Creek Anticline may be further to the southwest, which would put the claimed area on the northeast flank of the anticline. The beds dip about 2° to the southwest.

CHINLE ORE HORIZONS

In this area there are two ore producing horizons in the Chinle formation. In the upper unit the Tibbets sandstone or Black Ledge has produced locally, and the lower, the Moss Back member, is the main producing horizon in the area. 2/

The Tibbets or Black Ledge sandstone, which is about 20 feet thick, may occur anywhere between 100 and 150 feet below the Wingate-Chinle contact. This sandstone horizon contains two mines, the Rocket Jr. No. 4 and No. 6 claims in Mineral Canyon, a distance of about 8 miles from the area proposed for exploration. Mineralization in the Tibbets sandstone is not widespread and there are no other large producing mines in this upper horizon.

1/ USGS T.E.I.R. No. 328

2/ Stewart, J., Williams, G.A., Albee, H. F., and Raup, O.B., The Moss Back Member . . . a new member of the Upper Triassic Chinle Formation in Southeastern Utah, unpublished.

The lower ore horizon, the Moss Back member, is composed dominantly of yellowish-gray and very pale-orange, fine- to medium grained sandstone and subordinate lenses of siltstone and conglomerate.

The mineralization is contained in sandstone and conglomerate lenses deposited in channels cut into the underlying Moenkopi formation. The Moss Back channels may have as much as 30 to 50 feet of vertical relief and may have a width of 500 feet.

The larger producing mines of the area are located in channels that have a vertical relief of at least 30 feet. The possibility of a large tonnage of ore being found in the smaller channels is not too good.

ORE DEPOSITS

The ore deposits in the Tibbets sandstone are located in Mineral Canyon, a distance of about 8 miles from the Big Flat area. There are numerous small ore bodies in each deposit. The ore bodies may contain as much as 100 tons or as little as 25 tons. Total production from the Tibbets sandstone on the Rocket Jr. No. 4 and No. 6 claims through December 1954 was 206 tons of 0.32 percent U_3O_8. The grade of ore from the Tibbets sandstone is higher than the average grade of ore produced from the Moss Back member. The Rocket Jr. claims are the largest known producers from the Tibbets sandstone.

As stated previously, the mineralization occurs only locally and it would be unprofitable to drill the Tibbets sandstone in search for ore in the Big Flat area.

The ore deposits in the Moss Back member are widespread in the Inter-River area. Known ore deposits are located in the canyons cut by the Colorado and Green Rivers and their tributaries. There are undoubtedly similar deposits underlying the Big Flat area, but have not yet been discovered due undoubtedly to excessive drilling depths (800 - 900 feet) to the Moss Back member of the Chinle.

The largest known ore deposit in the Moss Back member in the area is the "C group" of claims. The production through December 1954, was 1,980 tons of 0.17 percent U_3O_8. The production has come from a group of 10 claims. Some of the claims have produced as little as 25 tons of ore, probably from only one ore body, and one claim probably containing several ore bodies produced 700 tons, averaging 0.17 percent U_3O_8. The "C group" of claims is about 10 miles southwest of the Big Flat area.

The Danise mine has produced 390 tons of .24 percent U_3O_8 through December 1954. It is one of the larger mines of the area and is about 11 miles west from the Big Flat area.

The probable target size for an ore body of 500 to 600 tons with an average thickness of 3 feet would be about 40 feet wide and 70 feet long. As the largest ore bodies of the area to date have been no greater than 700 tons, this could be the target size plus about 30 to 50 feet of mineralized material on the outer boundaries of the ore bodies. This would make an overall target size of about 70 to 90 feet wide and 100 to 120 feet long.

The average grade of ore produced from the area ranges from 0.17 percent to 0.24 percent U_3O_8 with the $CaCO_3$ content ranging from 10 to 25 percent. In order to return a fair profit on ore of such lime content, the grade must be kept at least 0.25 percent U_3O_8 or more.

PROPOSED EXPLORATION

The applicant proposes 26,825 feet of drilling at a total cost of $119,147.50, of which the DMEA is asked to loan $89,360.63.

The applicant's geologist believes that previous drilling has outlined a channel in the Moss Back member. The amount of vertical relief as shown by the previous drill holes is only 7 feet over a horizontal distance of about 250 feet. As there has been no further drilling to delineate the width of the channel, several possibilities exist, one of which might be proven by further offset drilling. As shown in figure 1, geologic cross section, contact A, the sides of the channel may raise, therefore, making the channel deeper or, as shown by contact B, the sides may assume a level position, or the sides may cut into the underlying Moenkopi formation. Also the sides of the channel may assume any position between contact A and B.

As stated earlier, the larger ore bodies are localized in channels with from 30 to 50 feet of vertical relief. Therefore, it would be necessary for the applicant to prove by further drilling that the channel sides do rise and give the channel a greater vertical depth than is now shown by present drilling.

The applicant's proposed drilling program was designed to extend both the length and width of the present channel. Even if the channel in the area of proposed exploration is proven to be deeper than now known as a result of further drilling across and along its trend, past experience implies that any mineralized deposits discovered may be relatively small and of low grade. An ore body containing about 30,000 tons, averaging 0.25 percent U_3O_8 would be required to profitably mine at depths of 800 to 900 feet as would be the case in this area. Unless the geologic conditions prove, by further exploration, to be much more favorable in the Big Flat area, the possibility of finding an ore body of the required tonnage is very remote.

CONCLUSIONS AND RECOMMENDATIONS

Because of the great drilling depth and the possibility of mineralized deposits being no larger than 600 to 700 tons, and that the channel in the Moss Back member in the area appears to be too shallow, it is concluded that there is only a small chance of finding mineralized deposits that can be profitably mined, I, therefore, recommend that DMEA assistance be denied.

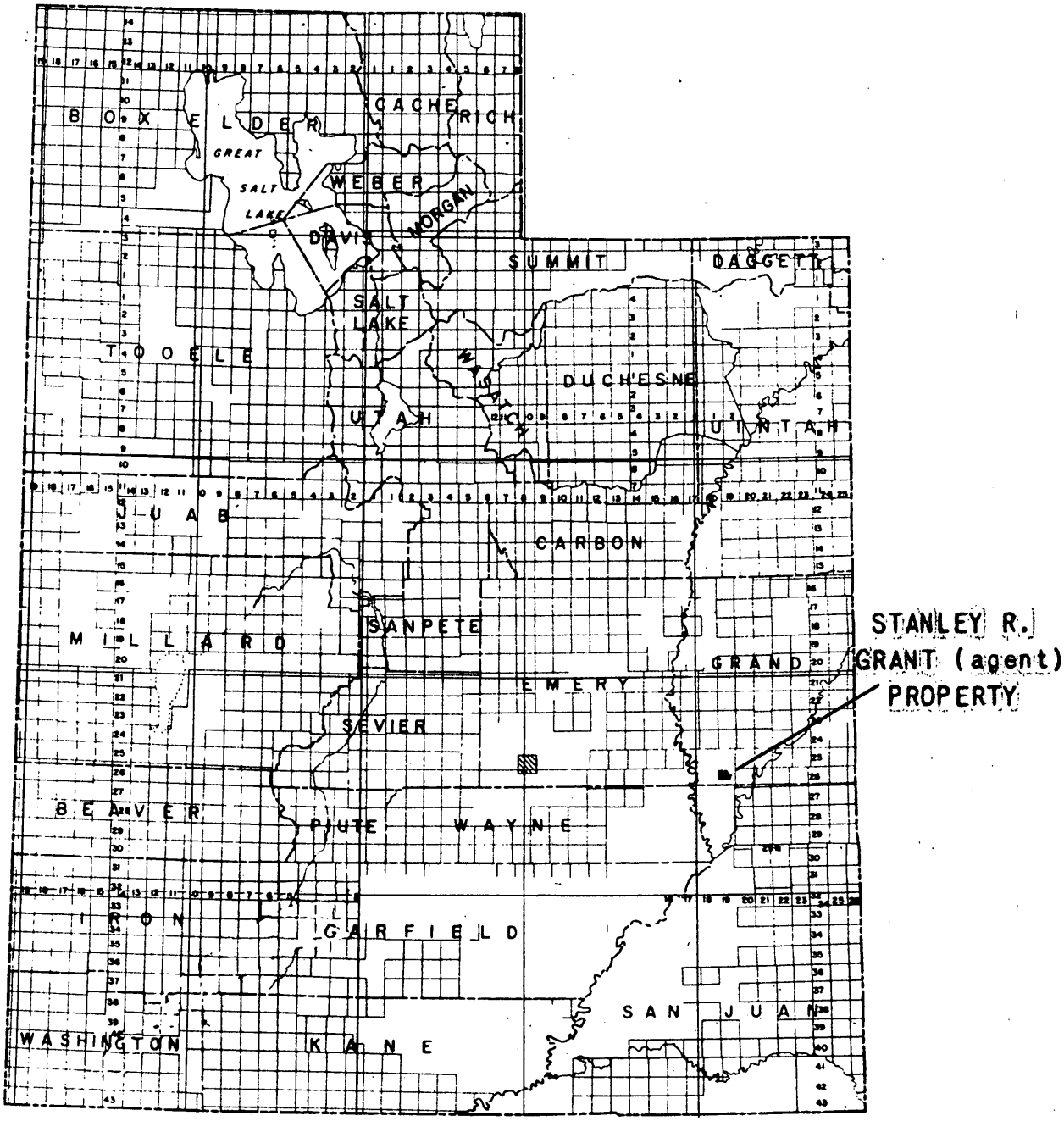
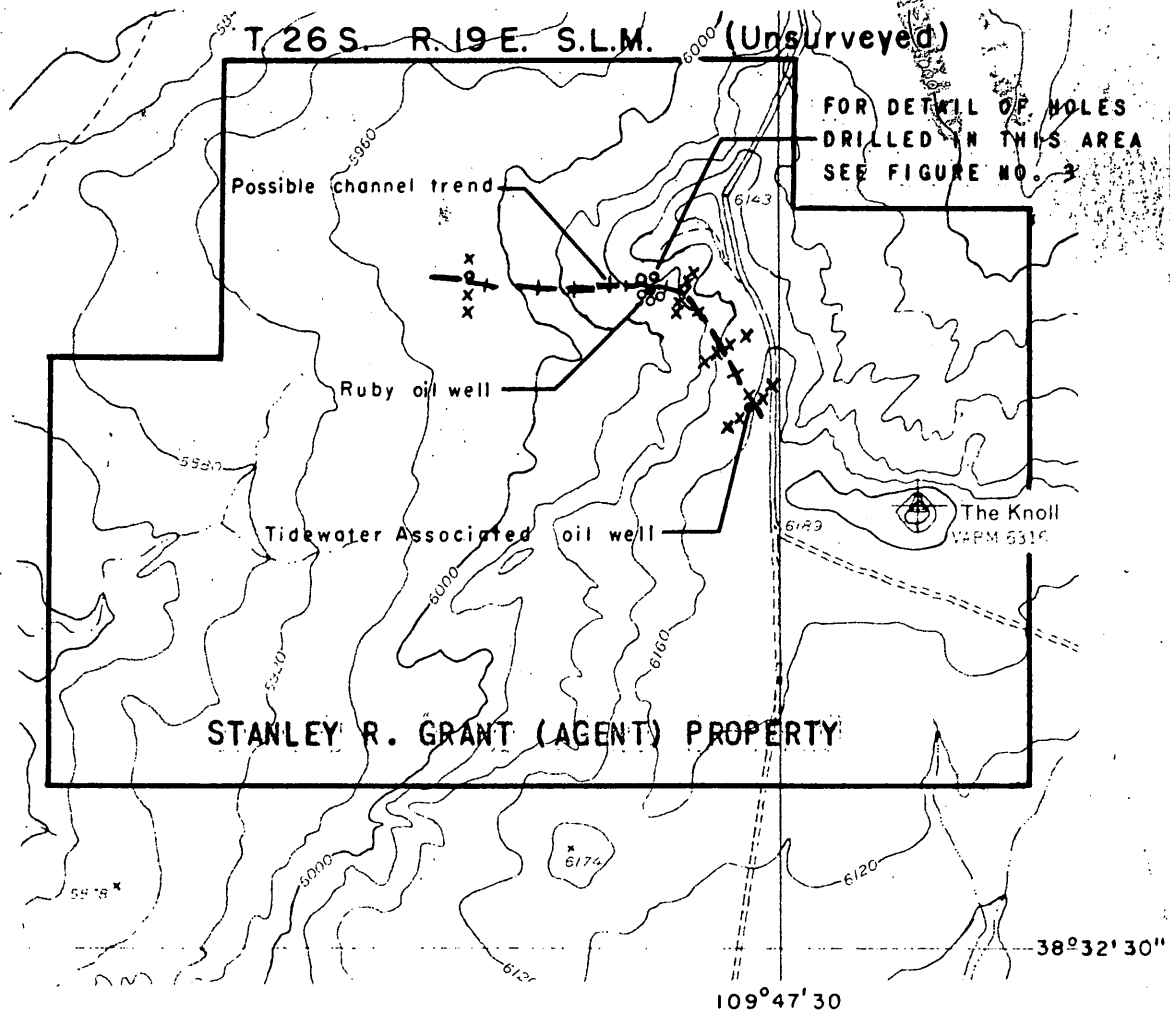


Figure 1. INDEX MAP OF UTAH SHOWING LOCATION OF STANLEY R. GRANT (agent) PROPERTY, BIG FLAT AREA, GRAND COUNTY, UTAH

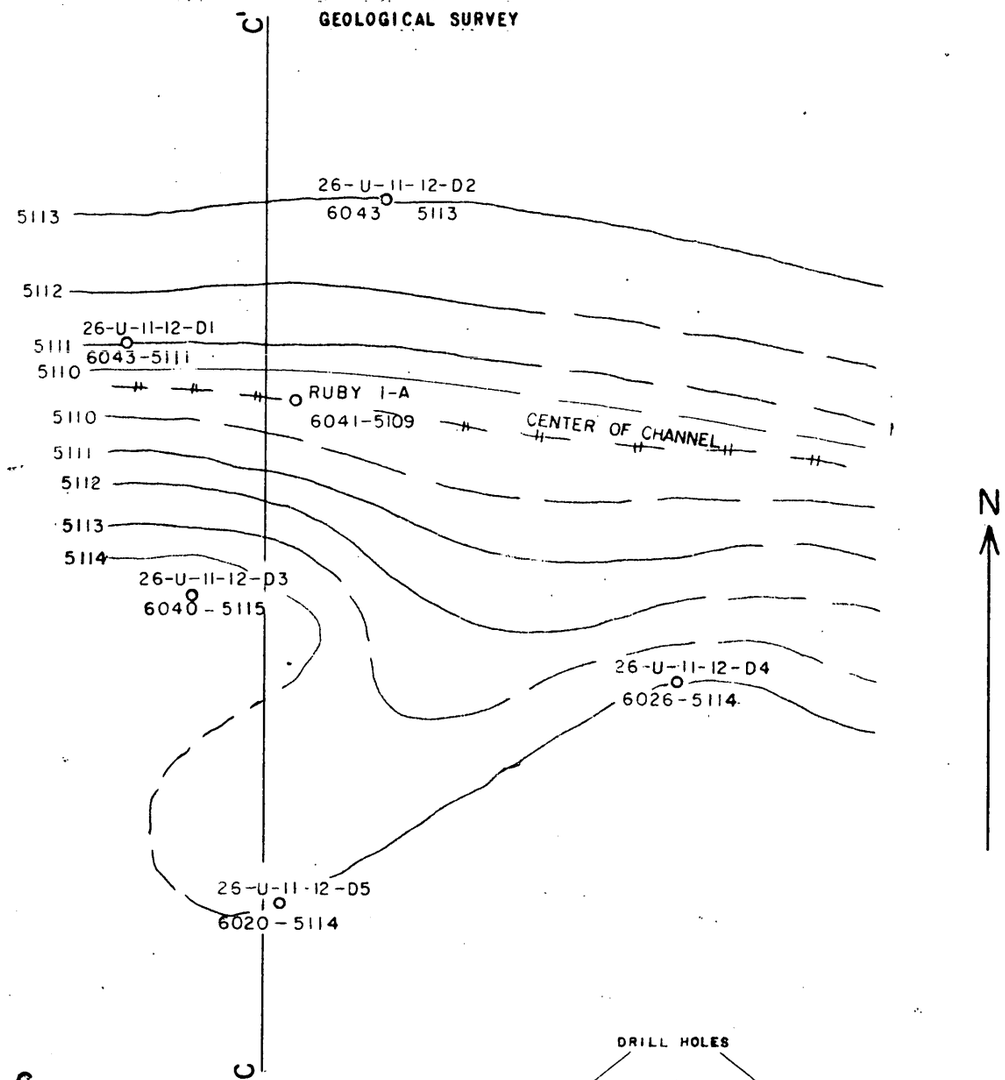


EXPLANATION

×	LOCATION OF APPLICANT'S PROPOSED DRILL HOLES
⊙	HOLE DRILLED BY APPLICANT
•	OIL WELL
+ +	POSSIBLE CHANNEL TREND

Note: BASE FROM U. S. GEOLOGICAL SURVEY QUADRANGLE MAP MOAB 3 S.E.,
HOLE LOCATIONS FROM APPLICANT'S MAP

Figure 2. MAP SHOWING LOCATION OF APPLICANT'S PROPOSED DRILLING ON STANLEY R. GRANT (AGENT) PROPERTY
GRAND COUNTY, UTAH



EXPLANATION
(map)

STRUCTURE CONTOUR ON TOP OF MOENKOPI FORMATION, DASHED WHERE LOCATED APPROXIMATELY, CONTOUR INTERVAL 1 FOOT

CLAIM NO. DRILL HOLE NO.
26-U-11-12-D2
6043 5113
ELEV. COLLAR ELEV. Ꞧc-Ꞧm CONTACT

DRILL HOLE DATA

(section)

Ꞧc
Ꞧm

GEOLOGIC CONTACT BETWEEN Ꞧc, TRIASSIC CHINLE, AND Ꞧm, TRIASSIC MOENKOPI FORMATIONS

A
B

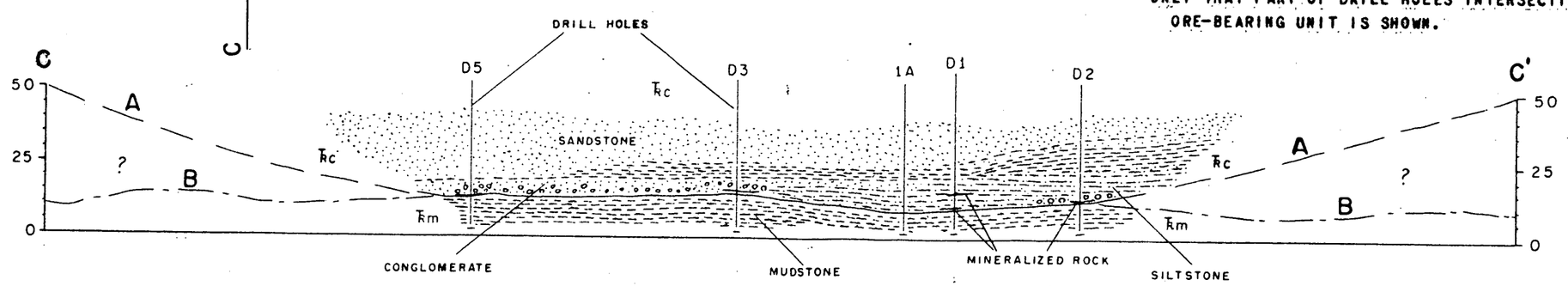
A AND B ARE PROBABLE GEOLOGIC CONTACTS BETWEEN TRIASSIC CHINLE AND TRIASSIC MOENKOPI FORMATIONS

Note: STRUCTURE CONTOURS AND DRILL HOLE LOCATIONS FROM APPLICANTS MAP. GEOLOGIC SECTION BY D.D. HAYNES, U.S.G.S., JUNE 8, 1955

50 0 150 FEET

DATUM IS MEAN SEA LEVEL

ONLY THAT PART OF DRILL HOLES INTERSECTING ORE-BEARING UNIT IS SHOWN.



WHERE NO ROCK SYMBOL IS SHOWN NO CORE WAS TAKEN

GEOLOGIC SECTION C-C'

Figure 3. MAP AND GEOLOGIC SECTION SHOWING CHINLE STREAM CHANNEL AND TWO INFERRED POSSIBILITIES OF BANK LOCATIONS OUTSIDE DRILLED AREA, STANLEY R. GRANT (agent) PROPERTY, BIG FLAT AREA, GRAND COUNTY, UTAH

LANE RADIOACTIVITY LOG WELLS
COMPANY

FILE NO. DR-9068

Location of Well: SE NW NW

COMPANY GLEN M. RUBY
WELL BIG FLAT UNIT #1
FIELD WILDCAT
COUNTY GRAND STATE UTAH
LOCATION SEC. 11-26S-19E

LOG MEAS. FROM 1952-- KB 6047, 1953 ELEV. 6053
DRLG. MEAS. FROM 1952--KB 6047, 1953 KB ELEV. 6053
PERM. DATUM 1952--KB 6047, 1953 KB ELEV. 6053

TYPE OF LOG	GAMMA RAY	NEUTRON		
RUN NO.	-NW	-NW		
DATE	12/16/52	12/16/52		
TOTAL DEPTH (DRILLER)	4498	4498		
EFFECTIVE DEPTH (DRILLER)	4498	4498		
TOP OF LOGGED INTERVAL	0	0		
BOTTOM OF LOGGED INTERVAL	4480	4480		
TYPE OF FLUID IN HOLE	MUD	MUD		
FLUID LEVEL	FULL	FULL		
MAXIMUM RECORDED TEMP.				
NEUTRON SOURCE STRENGTH & TYPE		500M		
SOURCE SPACING – IN.		8.25		
LENGTH OF MEASURING DEVICE – IN.	36	9		
O.D. OF INSTRUMENT – IN.	3-5/8	3-5/8		
TIME CONSTANT – SECONDS	4	3.2		
LOGGING SPEED FT./MIN.	40	40		
STATISTICAL VARIATION – IN.				
SENSITIVITY REFERENCE	274	274		
RECORDED BY	STEPHENSON	STEPHENSON		
WITNESSED BY	MCFADDIN	MCFADDIN		

TYPE OF LOG	GAMMA RAY	NEUTRON	GAMMA RAY	NEUTRON
RUN NO.	-NW	-NW	-NW	-NW
DATE	2/10/53	2/10/53	3/19/53	3/19/53
TOTAL DEPTH (DRILLER)	7881	7881	8213	8213
EFFECTIVE DEPTH (DRILLER)	7881	7881	8180	8180
TOP OF LOGGED INTERVAL	4482	4482	7879	7879
BOTTOM OF LOGGED INTERVAL	7879	7879	8180	8180
TYPE OF FLUID IN HOLE	WATER	WATER	WATER	WATER
FLUID LEVEL	FULL	FULL	FULL	FULL
MAXIMUM RECORDED TEMP.				
NEUTRON SOURCE STRENGTH & TYPE		600M		600M
SOURCE SPACING – IN.		8.25		8.25
LENGTH OF MEASURING DEVICE – IN.	36	9	36	9
O.D. OF INSTRUMENT – IN.	3-5/8	3-5/8	3-5/8	3-5/8
TIME CONSTANT – SECONDS	5	4	5	4
LOGGING SPEED FT./MIN.	35	35	35	35
STATISTICAL VARIATION – IN.				
SENSITIVITY REFERENCE	274	275	274	275
RECORDED BY	KLEINEGGER	KLEINEGGER	KLEINEGGER	
WITNESSED BY	MC-FADDIN	RUBY	ARNELL	ARNELL

CASING RECORD

RUN NO.	SIZE–IN.	WT.–LB.	INTERVAL
1	8-5/8	32	SURF. TO 4489
1	7	23	SURF. TO 7810

OPEN (BORE) HOLE RECORD

BIT SIZE–IN.	INTERVAL
	SURF. TO 4418
	SURF. TO 7808

REMARKS OR OTHER DATA

NOTE: CASING AT 4418 PROBABLY DUE TO DRILLING OUTSIDE 8-5/8" CASING AT THIS POINT.
UNABLE TO OBTAIN COLLARS ON 7" CASING - BECAUSE OF TYPE OF PIPE.

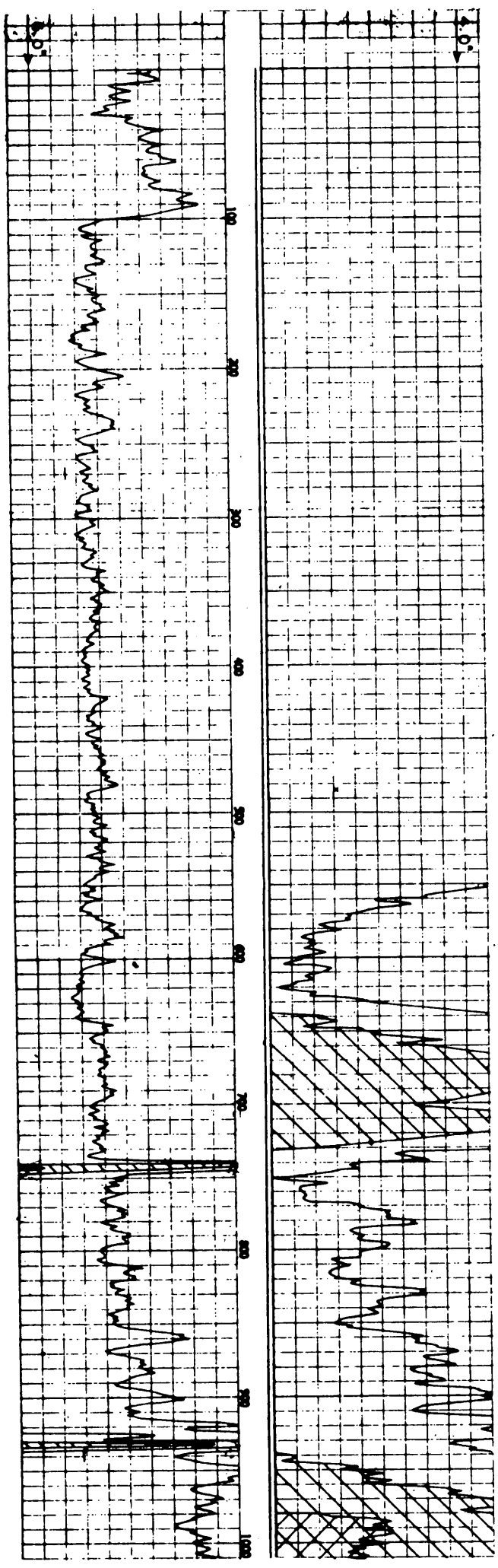
GAMMA RAY → RADIATION INTENSITY INCREASES

DEPTH SCALE 1" = 50'

NEUTRON → RADIATION INTENSITY INCREASES

A RILEY REPRODUCTION
U.S. PATENT PENDING

Surface Elev. 6041. Ruby



LANE RADIOACTIVITY LOG WELLS
COMPANY

DR-4225

Location of Well: Surface Elev. 6143.

COMPANY TIDEWATER ASSOC. OIL CO.
WELL BIG FLAT #7A-11
FIELD WILDCAT
COUNTY GRAND STATE UTAH
LOCATION SEC. 11-26S-19E

LOG MEASURED FROM K.B. 11' A.G.L. ELEVATION 6151'
DRILLING MEASURED FROM _____ ELEVATION _____
PERMANENT DATUM K.B. 11' A.G.L. ELEVATION 6151'

RUN NUMBER	ONE	ONE		
TYPE OF LOG	GAMMA-RAY	NEUTRON		
DATE	8-7-4[illegible]	8-7-4[illegible]		
COMPANY DEPTH	8389	8389		
MAXIMUM DEPTH REACHED	8389	8389		
WELL FLUID	MUD	MUD		
FLUID LEVEL	FULL	FULL		
MAXIMUM TEMPERATURE				
O.D. OF INSTRUMENT—INCHES	3 5/8	3 5/8		
SENSITIVITY REFERENCE	274	275		
RECORDED BY	NABORS	NABORS		
WITNESSED BY	ENDERS	ENDERS		

CASING RECORD

RUN NO.	SIZE–IN.	WT.–LB.	INTERVAL
1	13 3/8		0 TO 742
1	9 5/8		0 TO 3962
			TO
			TO
			TO

OPEN HOLE RECORD

BIT SIZE–IN.	INTERVAL
	3962 TO 8389
	TO
	TO
	TO

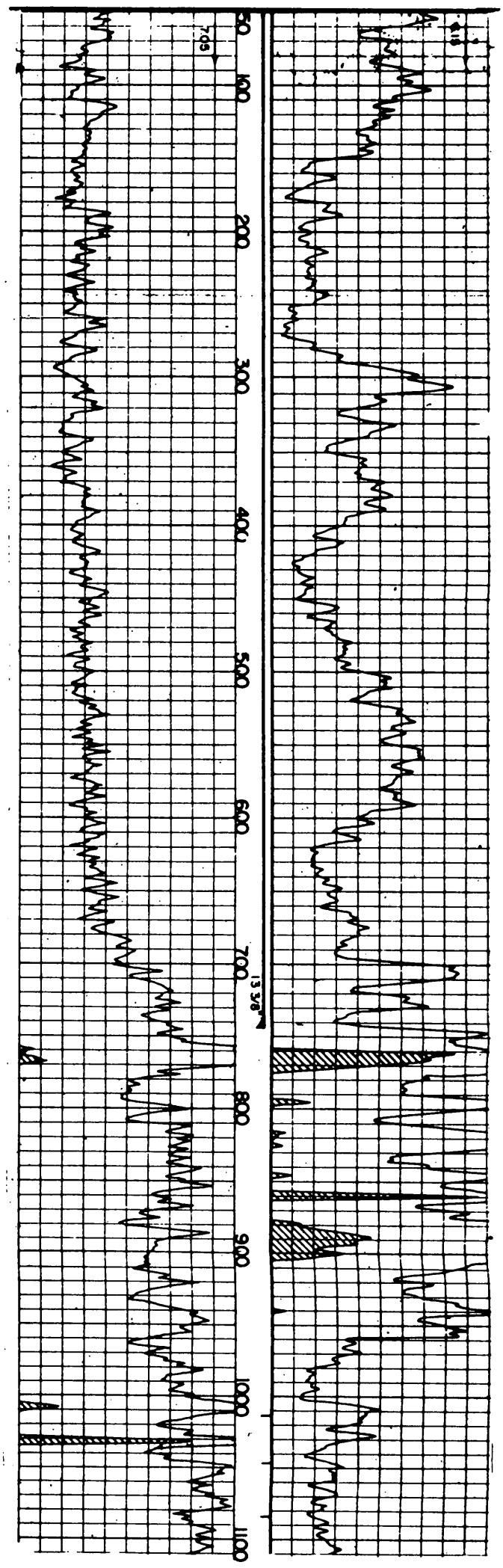
REMARKS OR OTHER DATA

GAMMA RAY → RADIATION INTENSITY INCREASES

DEPTH SCALE 1" = 50'

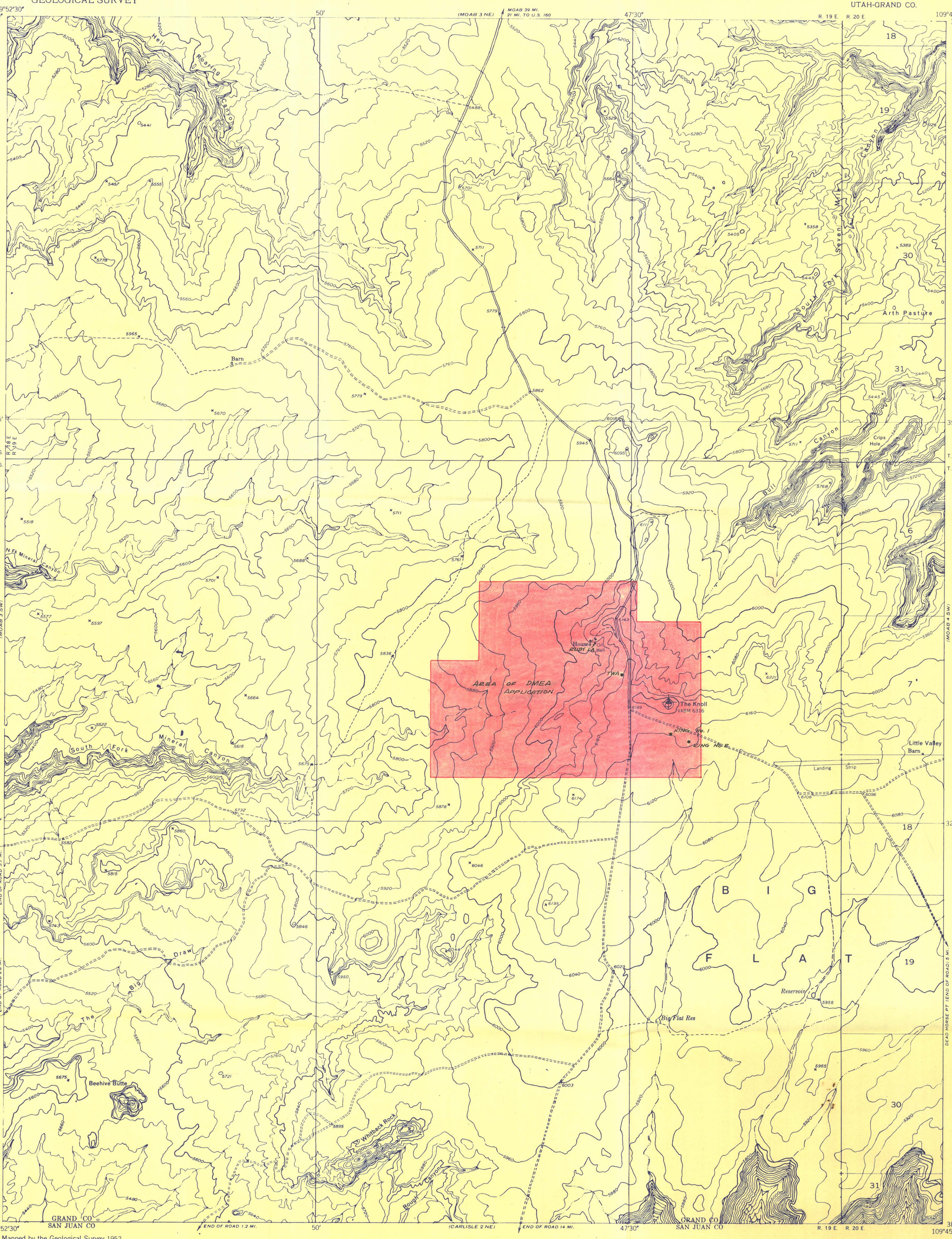
NEUTRON → RADIATION INTENSITY INCREASES

A RILEY REPRODUCTION
U.S. PATENT PENDING



DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MOAB 3 SE QUADRANGLE
UTAH-GRAND CO.



Mapped by the Geological Survey 1952

Topography by multiplex methods from aerial photographs taken 1951

Data subject to minor corrections when incorporated in a standard series map

15½°
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1952

SCALE 1:24000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

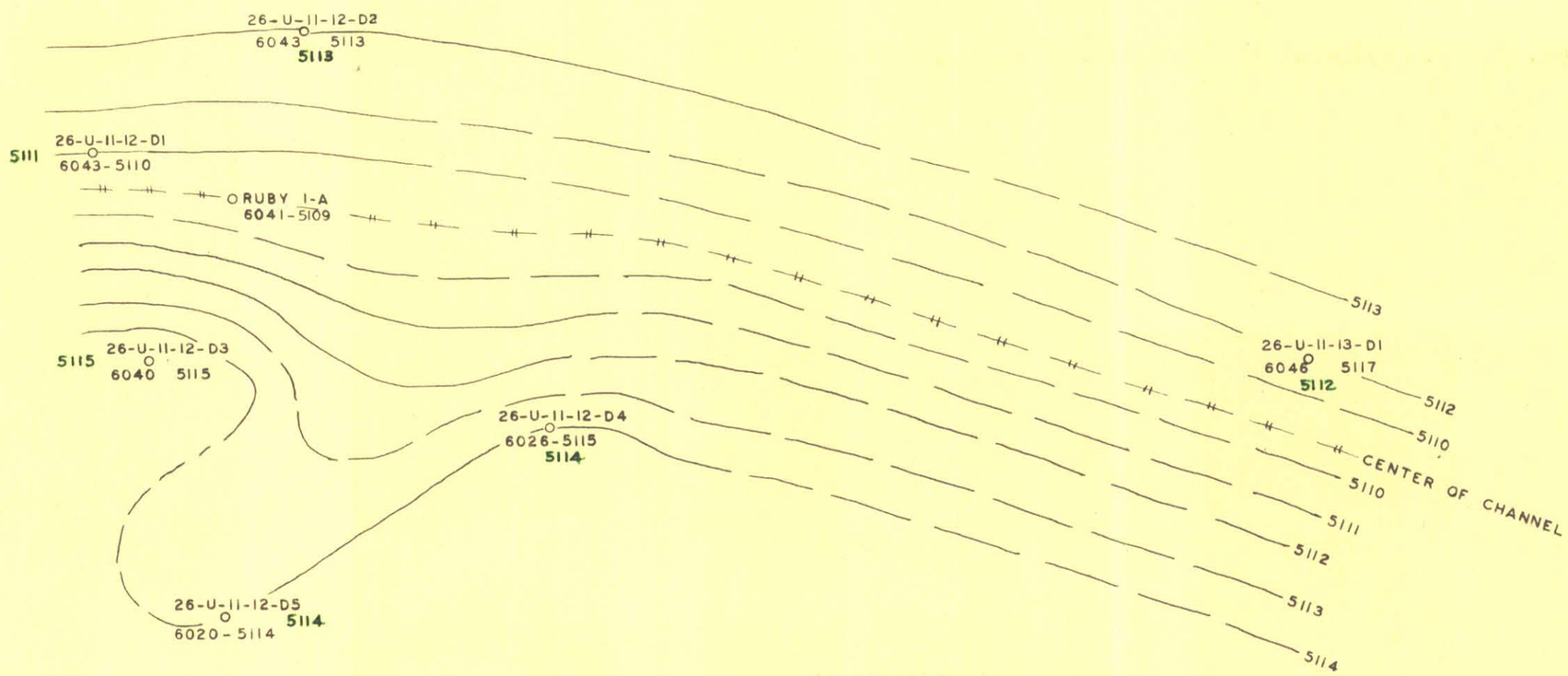
CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Improved ——— Unimproved - - - - -

MOAB 3 SE, UTAH
N3830—W10945/7.5
U 245 SE

STANLEY R. GRANT, AGENT
42 WALL ST.
NEW YORK, N.Y.



MAP NO. 4

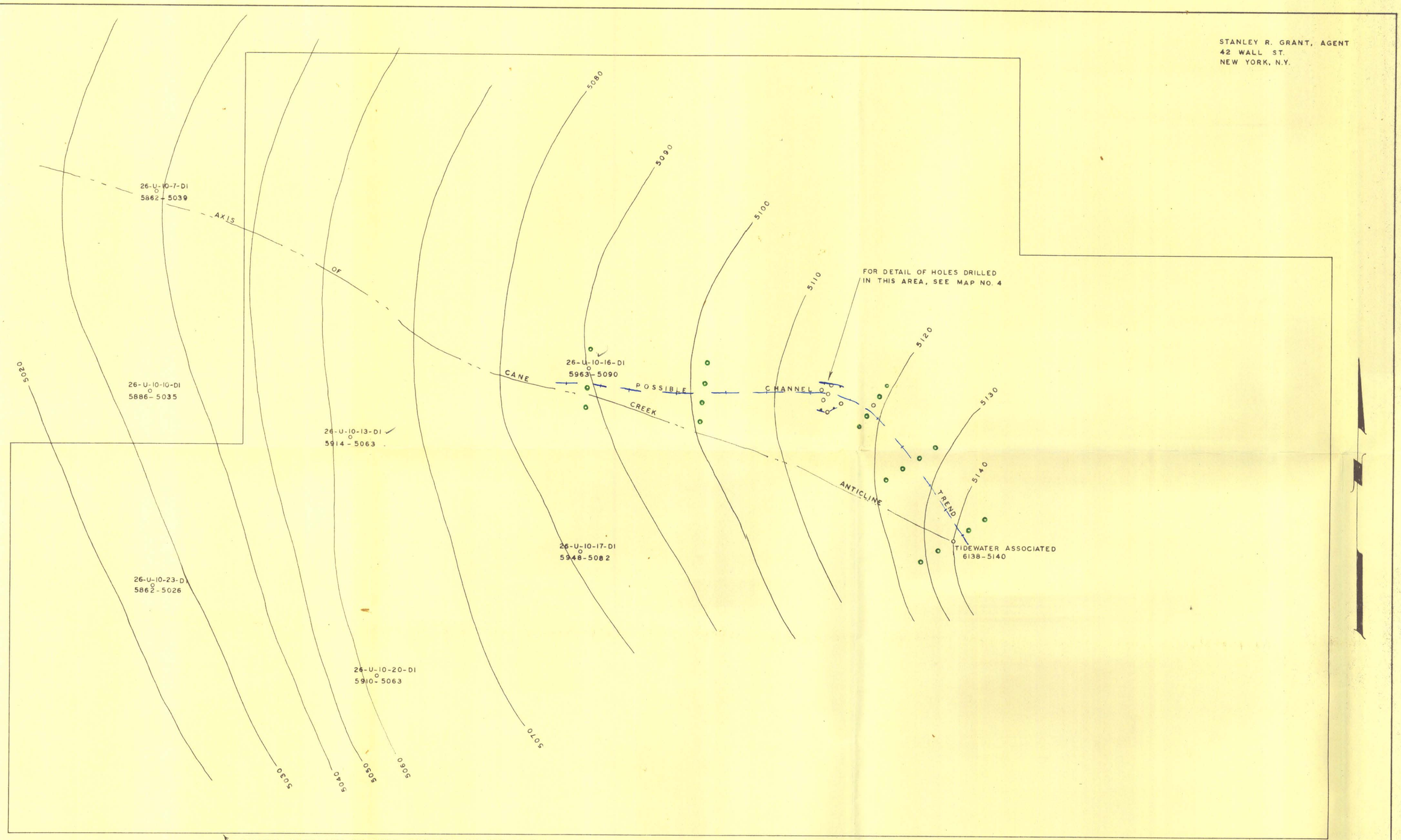
RUBY NO. I DRILL AREA

GRAND CO. UTAH

1" = 50'

Feb., 1955 E.H.E., Jr.

CLAIM NO. DRILL HOLE NO.
26-U-11-12-D5
6020 5114
ELEV. COLLAR UNCORRECTED ELEV. Tac-Tm CONTACT
5112 CORRECTED ELEV.



MAP NO. 3

BIG FLAT UNIT DRILL AREA

GRAND COUNTY UTAH

1" = 500'

February, 1955 E. H. Eakland, Jr

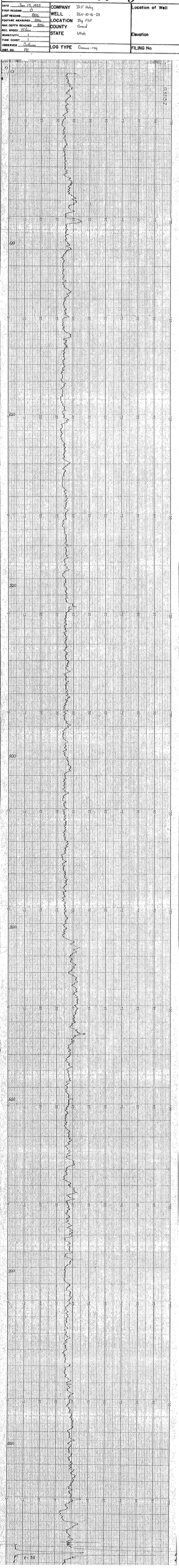
EXPLANATION

CLAIM NO. DRILL HOLE NO.
26-U-10-23-DI
5862 - 5026
ELEV. COLLAR ELEV. Tkc-Tkm CONTACT

○ COMPLETED DRILL HOLE
○ PROPOSED FIRST STAGE DRILL HOLE

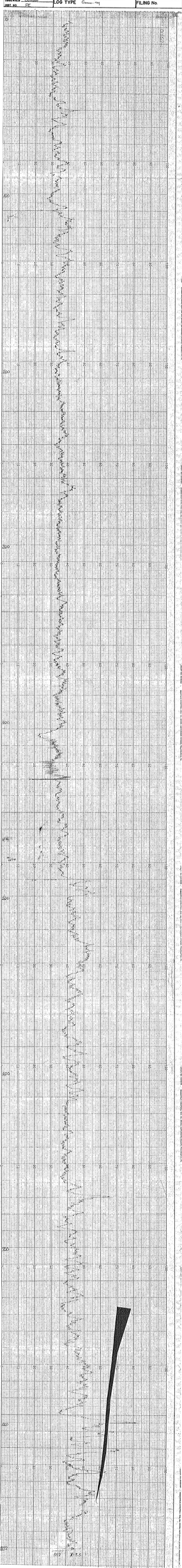
Empire Logging Co.

DATE Jan. 15, 1955	COMPANY	D F Haley	Location of Well
FIRST READING 0	WELL	RLV 10-4-D1	
LAST READING 800	LOCATION	Big Hill	
PORTABE MEASURED 800	COUNTY	Grand	
MAX. DEPTH REACHED 800	STATE	Utah	Elevation
REC. SPEED 15 fm			
SENSITIVITY 1			
TIME CONST.			
OBSERVER Sullivan	LOG TYPE	Gamma-ray	FILING No.
UNIT NO. 52			



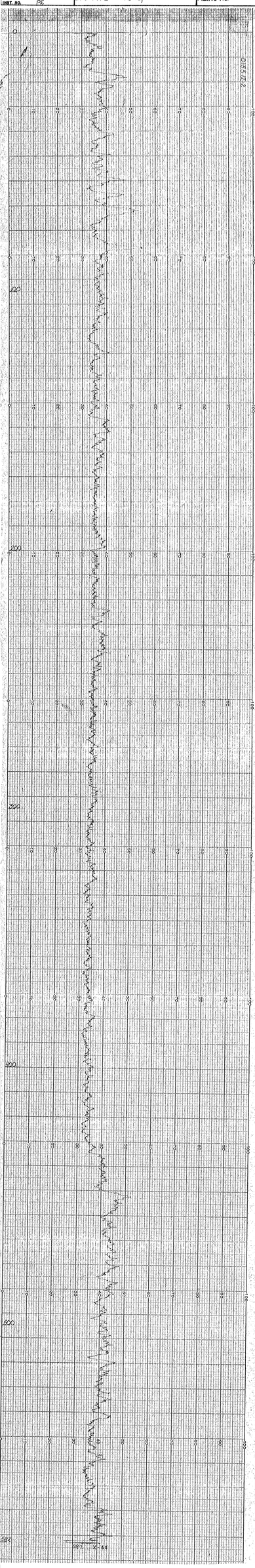
Empire Logging Co.

DATE Jan 12, 1952	COMPANY D.F. Haley	Location of Well	
FIRST READING 0	WELL 2W-10-D-D1		
LAST READING 872	LOCATION Big Flat		
FOOTAGE MEASURED 872	COUNTY Grand		
MAX DEPTH REACHED 872	STATE Utah	Elevation	
REC. SPEED 10 fpm			
SENSITIVITY 1			
TIME CONST. 1			
OBSERVER Dickson	LOG TYPE Gamma-ray	FILING No.	
JOB NO. 12F			



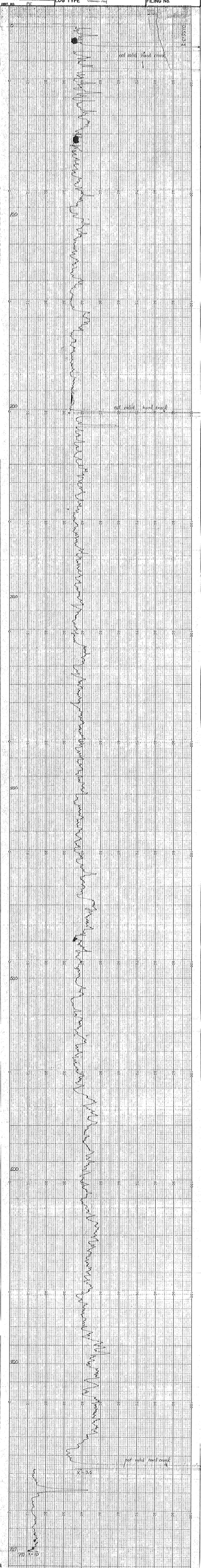
Empire Logging Co.

DATE Jan 12 1955	COMPANY DF Haley	Location of Well
FIRST READING 0	WELL 26-10-13-D1	
LAST READING 582	LOCATION Big Flat	
FOOTAGE MEASURED 582	COUNTY Grand	
MAX. DEPTH REACHED 582	STATE Utah	Elevation
REC. SPEED 15'/min		
SENSITIVITY 1		
TIME CONST. 1		
OBSERVER Sullivan	LOG TYPE Gamma-ray	FILING No.
INST. NO. PE		



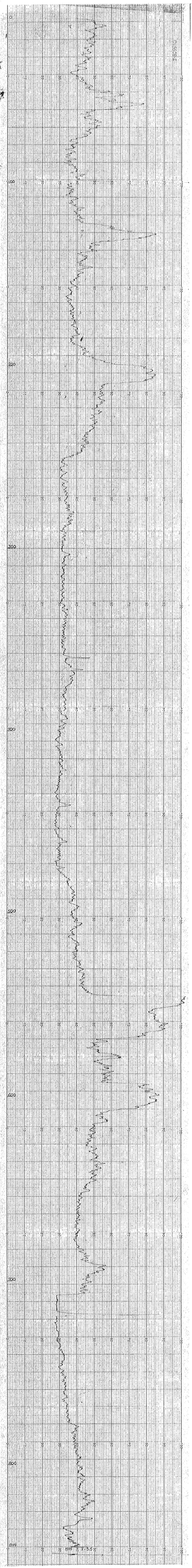
Empire Logging Co.

DATE Jan 15, 1955	COMPANY D.F. Haley		Location of Well
FIRST READING 0	WELL 26U-10-20-IN		
LAST READING 737	LOCATION Big Pup		
FOOTAGE MEASURED 737	COUNTY Grand		
MAX. DEPTH REACHED 737	STATE Utah		Elevation
REC. SPEED 15 fpm			
SENSITIVITY 1			
TIME CONST.			
CABLE NO. Dallas	LOG TYPE Gamma-ray		FILING No.
JOB NO. 96			



Empire Logging Co.

DATE Jan 8, 1955	COMPANY	D.F. Haley	Location of Well
FIRST READING 0	WELL	2L0-10-23-D1	
LAST READING 1944	LOCATION	Big Flat	
FOOTAGE MEASURED 1944	COUNTY	Grand	
MAX. DEPTH READING 1989	STATE	Utah	Elevation
REC. SPEED 10 fpm			
SENSITIVITY 1			
TIME CONST. 1			
OBSERVER Sullivan	LOG TYPE	Gamma-ray	FILING No.
UNIT NO. 02			



Empire Logging Co.

DATE	Dec. 11, 1955	COMPANY	D.F. Haley	Location of Well
FIRST READING	0	WELL	26U-11-12-D1	
LAST READING	943	LOCATION	Big Flat	
FOOTAGE MEASURED	943	COUNTY	Grand	
MAX. DEPTH REACHED	943	STATE	Utah	Elevation
REC. SPEED	15'/min			
SENSITIVITY	1			
TIME CONST.	1			
OBSERVER	Sullivan	LOG TYPE	Gamma-ray	FILING No.
INST. NO.	PE			

[redacted]

Empire Logging Co.

DATE Dec. 11, 1954	COMPANY D.F. Haley	Location of Well
FIRST READING 0	WELL 26U-11-12-D2	
LAST READING 945	LOCATION Big Flat	
FOOTAGE MEASURED 945	COUNTY Grand	
MAX. DEPTH REACHED 945	STATE Utah	Elevation
REC. SPEED 15'/min		
SENSITIVITY 1		
TIME CONST. 1		
OBSERVER Sullivan	LOG TYPE Gamma-ray	
INST. NO.		FILING No.

Empire Logging Co.

DATE Dec 11 1959
FIRST READING 0
LAST READING 937
FOOTAGE MEASURED 937
MAX DEPTH READED 937
REC. SPEED 25 fpm
SCRATCHITS 1
TIME CONST.
OBSERVER Jackson
DATE 12-12-59

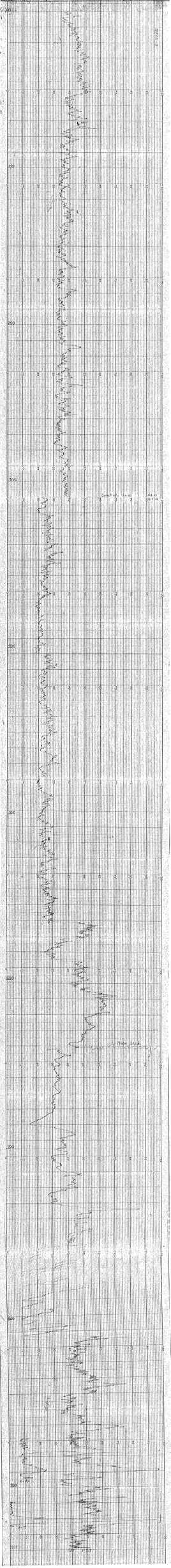
COMPANY D.C. Oakley
WELL 5G-11-11-D5
LOCATION Big Flat
COUNTY Grand
STATE Utah

LOG TYPE Gamma ray

Location of Well

Elevation

FILING No.



Empire Logging Co.

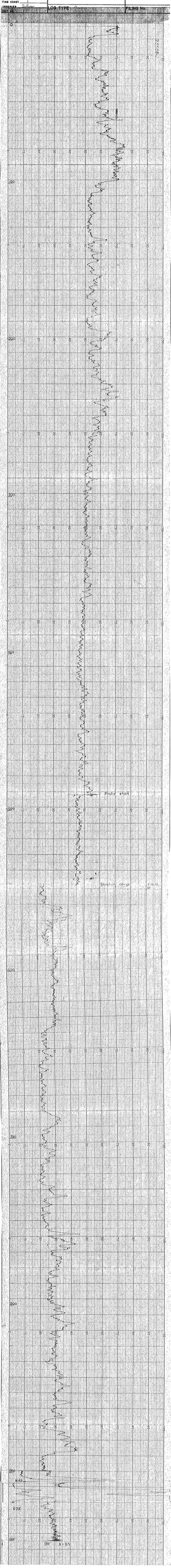
DATE	Jan 8, 1965
FIRST READING	0
LAST READING	391
PURPOSE MEASUREMENT	391
MAX DEPTH REACHED	391
REEL SPEED	15 fpm
SENSITIVITY	1
TIME CORRY	1
OPERATOR	Nelson
TIME	

COMPANY	D.F. Haley
WELL	26-16-12-24
LOCATION	Big Flat
COUNTY	Grand
STATE	Utah
LOG TYPE	

Location of Well

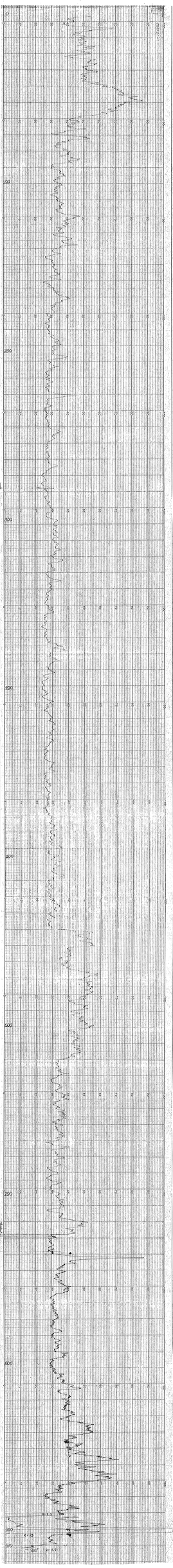
Elevation

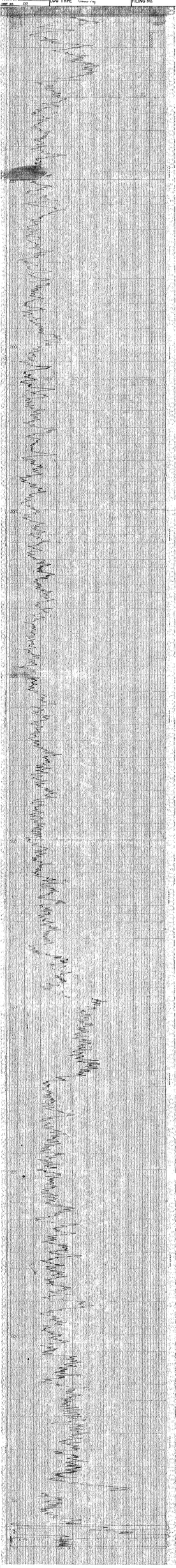
Filing No.



Empire Logging Co.

DATE Dec 21 1955	COMPANY	J.R. Haley	Location of Well
FIRST READING 0	WELL	26S-21-E-25	
LAST READING 910	LOCATION	Big Flat	
POSITIVE READINGS 910	COUNTY	Grand	
MAX DEPTH REACHED 910	STATE	Utah	Elevation
REC. SPEED 25 fpm			
SENSITIVITY 5			
TIME CONST. 5			
OBSERVER Sullivan	LOG TYPE	Gamma-ray	FILING No.
DET. NO. DK			



Empire Logging Co.

DATE Feb. 3, 1955	COMPANY	D.F. Haley	Location of Well
FIRST READING 0	WELL	26-11-13-D1	
LAST READING 927	LOCATION	Big Flat	
FOOTAGE MEASURED 927	COUNTY	Grand	
MAX DEPTH REACHED 927	STATE	Utah	Elevation
REC. SPEED 50m			
SENSITIVITY 1			
TIME CONST 15			
OBSERVER Sullivan	LOG TYPE	Gamma ray	FILING No.
CASE NO. 191