5/14/56 Crawford

MF 103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

DMEA
Date Rec'd. JUN 11 1956
RECEIVED JUN 13 1956
BUREAU OF MINES
Denver, Colorado

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

Not to be filled in by applicant

Docket No. DMEA-4331
Metal or Mineral URANIUM
Date Received 6/13/56
Estimated Cost $28,660.00
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: Big Sioux Uranium-Mineral Co.
1209 South Main Avnue. Sioux Falls. So. Dak.
See enclosed Prospectus.

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

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

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

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

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

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

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

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

(*e*) If you own the land, describe any liens or encumbrances on it See copy of Enclosed Leases.

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

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

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

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

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

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

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

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

(*c*) The work will start within 30 days and be completed within 6 months from the date of an exploration project contract.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated June 8, 1956

Big Sioux Uranium Mining Co
(Applicant)

By Francis Michaud V.P.
Director

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

INT.-DUP. SEC., WASH., D.C. 64941

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Hot Springs, S. D.
April 5, 1956

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JUN 1 3 1956

Big Sioux Uranium & Mineral Co.
c/o Francis Michaud
Hot Springs, S. D.

ATTENTION: Mr. Francis Michaud

Dear Sir:

We submit our bid for drilling for Big Sioux Uranium & Mineral Co. located in Fall River County, South Dakota, as follows:

Plug Drilling
0 - 100 ft. @ $1.00
100 - 200 ft. @ 1.15
200 - 300 ft. @ 1.35
300 - 400 ft. @ 1.55

Core Drilling
0 - 100 ft. @ $2.00
100 - 200 ft. @ 2.25
200 - 300 ft. @ 2.55
300 - 400 ft. @ 2.90

Bottom Hole Core (20 ft. of core)
0 - 100 ft. @ $1.50
100 - 200 ft. @ 1.75
200 - 300 ft. @ 2.05
300 - 400 ft. @ 2.40

Standby time $12.00 per hour

Any casing, cementing, blind holes, work over, etc. will be done at stand-by rates of $12.00 per hour with Big Sioux furnishing the materials.

Big Sioux will furnish roads, drill sites, bulldozers, etc., necessary to expedite the drilling.

McGuire Drilling Co. will furnish rigs, men, bits, drilling mud and all necessary equipment to drill with. Drilling with air will be used as much as possible.

McGuire Drilling Company

O M McGuire Jr

By: O. M. McGuire, Jr.

COST ESTIMATE

OF

BIG BICUX DRILLING PROJECT

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First Phase

Canyon Group -	3200 ft at 1.10 /ft.	$3520.00
	200 ft (core) at 2.35 /ft.....	470.00
McClure Lease & Eleven Claim Group -	4200 ft at 1.25 /ft.....	5250.00
	100 ft (core) at 2.90 /ft..	290.00
Geological Consulting Fees and Expenses		1000.00
Misc. (Drilling Stand by Time, Cost of Casing if needed) & Misc. supplies		1000.00
Sampling - Labor $12.00 / day - 60 days.....		7200.00
		$12250.00

UNIT COST / FOOT - $12250/7700ft. = $1.59

Estimated amount of dozer work needed - 5 days at $14.00 /day	$1680.00
Sample analyses - 100 at $3.50 each	350.00
Cost of handling and postage.....	50.00
	$2080.00
Total cost for first phase of drilling.....	$14330.00
Estimated cost for second phase of drilling.....	$14330.00
Total cost of project including both first and second phases of drilling.....	$28660.00
(Cost to government at 75%)	$21495.00

A GEOLOGIC REPORT ON CERTAIN HOLDINGS OF THE BIG SIOUX URANIUM AND MINERAL CO. INC.

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In order to supplement a previous report on properties held by the Big Sioux Uranium and Mineral Co., a brief geologic investigation was made of the following additional properties.

1. A total of 320 acres described as the Abram E. McClure lease consisting of the southwest quarter (SW¼) of section twenty-nine (29) and the northwest quarter (NW¼) of section thirty-two (32), in township 8 South, Range 4 East of the Black Hills Meridian.
2. Eleven lode mining claims - the Flat Lode, Sunday Lode No. 1, Jim Lode, Hull Lode, Hanson No. 1, Hanson Lode, Number Five Lode, Peter Lode, Number Seven, Sunday Lode and the Sunday Number Two Lode all in section thirty-four (34), township 8 South, Range 4 East of the Black Hills Meridian.

Nearly the full section of Inyan Kara lithology is exposed on both the McClure lease and the Eleven Claim group, however the unit sequence has altered considerably from that of the Canyon group of claims as described in the previous report.

The Fall River consists primarily of brown, medium bedded to massive fine-grained quartz sandstones with frequent lenses of dark gray to black siltstones. Total thickness of the Fall River

averages 150 feet with the siltstones generally occurring in the central section.

The variegated claystones and siltstones of the Fuson formation appear to be about 60-70 feet thick on both of these properties.

The 200 feet thick massive Lakota sandstone of the Canyon Group has split up into an irregular series of sandstone units and thin bedded sandstone-siltstone units in the vicinity of both the claim group and the McClure lease.

The area immediately west of the McClure lease is known locally as the Lower Chilson Canyon Area and is the site of several producing mines and numerous visible occurrences of uranium mineralization. All of the known uranium deposits here are concentrated in the basal section of the Lakota formation. The ore minerals in these deposits have all been of the secondary "carnotite type" with a vanadium content approximately equivalent to that of the U_3O_8. The Atomic Energy Commission has done a considerable amount of core drilling on the Lorenz Property which is adjacent to the McClure lease on the west. From talks with the owners it appears that the drilling indicated a definite relationship between the ore location and the nature of the Lakota contact with the underlying Morrison formation. The contact is unconformable with a series of basins and swells marking the Morrison surface. Uranium mineralization was generally confined to the flanks or areas between the "highs" and "lows" in the Morrison surface. Evidently drilling did not progress to a point outlining any directional trends.

One surficial radioactivity anomaly has been located on each of the two properties. Both are assumed to be in a sandstone of the upper Fall River formation, however surface soil cover prevents inves-

tigation of the source. In the experience of the writer the greater number of this type of surface anomaly in the area are the result of residual material in the soil itself and rarely lead to a commercial uranium deposit.

The greatest potential of these two properties with respect to economic uranium deposits probably lie in the Basal Lakota formation. The wide area of known uranium occurrences in the vicinity indicate extensive mineralization and increase the probability of ore location through drilling.

It is suggested that five or six drill holes be put down on each of the two properties, widely spaced so as to gain maximum information from each. All of the holes should be drilled to the Morrison contact and would probably average greater than 400 feet in depth. Structure contouring of this contact would outline any mahor depressions or basins in the Morrison surface and indicate the position of future drilling.

Essentially both properties appear to be located in a favorable area by virtue of proximity to a known mineralized area with the same lithologic horizons present.

Respectfully submitted

Ralph B. Hall
Consulting Geologist

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Preliminary Report on the Geology of the Hans, Side Hill, Canyon, Niggar and Niggar Hill Mining Claims, Fall River County, South Dakota

by

Ralph B. Hall

March 1956

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PURPOSE

This investigation was initiated for the purpose of determining the potential of the below mentioned properties with respect to economic uranium deposits. A discussion of the local geology is presented with emphasis upon stratigraphy and its similarity to near-by producing deposits. A tentative plan for future exploration is formulated, based upon known geologic criteria.

LOCATION

The five mining claims described below are all located in the SE¼ of section 25, Township 8 South, Range 4 East, Fall River County, South Dakota. All are recorded in the Miscellaneous Records Office of the Register of Deeds, Hot Springs, South Dakota as follows;

Niggar Hill Lode	Book	35	Page	185
Niggar Lode	"	35	"	185
Hans Lode	"	35	"	188
Canyon Lode	"	35	"	189
Side Hill Lode	"	35	"	189

The nearest town is Hot Springs, South Dakota, which lies approximately 11.5 miles to the northeast. The property is reached by travelling approximately one mile on a trail that leads west from a point 10.5 miles South of Hot Springs on South Dakota Highway #87. This trail suffices in good weather but is apt to be impassible in wet weather and during the spring thawing season.

OWNERSHIP

The mineral rights on this group of five claims are owned by the Big Sioux Uranium and Mineral Company Incorporated of Sioux Falls, South Dakota. The claims are subject to overriding royalties of thirteen and one half per cent (13½ %) divided between the original land owner and the original claim locators.

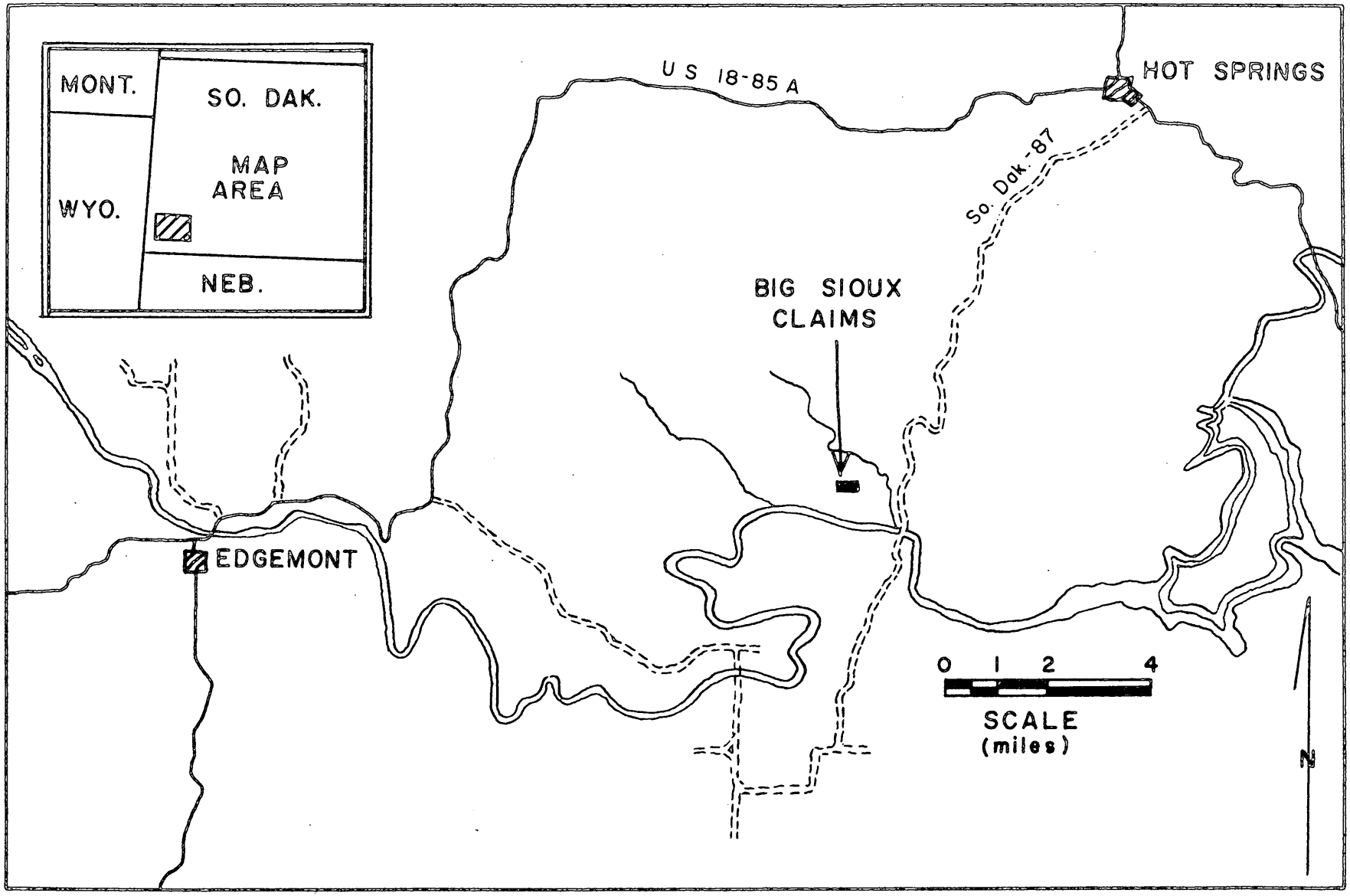
GEOGRAPHY

Surface features of the canyon group of claims roughly divide the area into two distinct units. The eastern half comprising all of the Niggar Hill Lode and Niggar Lode claims plus a part of the Canyon Lode Claim, forms a gentle south-easterly dipping surface controlled by the dip of the underlying resistant sandstone. This surface is a part of the inter-canyon divide between Mike Canyon to the north-east and Cedar Canyon to the west. The Hans Lode, Side Hill Lode and the remaining part of the Canyon Lode cover the steep slopes and base of Cedar Canyon.

Topographic relief varies with a maximum of approximately 250 feet. A Maximum elevation of 3540 feet is attained in the north-eastern section of the group and a minimum elevation of 3290 in the bottom of Cedar Canyon on the South.

Vegetation is sparse with Ponderosa pine confined to the head and slopes of the draws. Most of the flat surface is grass-covered with occasional patches of sagebrush.

Drainage over the property is into Cedar Canyon and thence south to the Cheyenne River.


MONT.
SO. DAK.
MAP AREA
WYO.
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HOT SPRINGS
So. Dak.-87
BIG SIOUX CLAIMS
EDGEMONT
0 1 2 4
SCALE (miles)
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INDEX MAP

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REGIONAL GEOLOGY

The Canyon group is located within the resistant sediments that form the outermost hogback surrounding the Black Hills. In descending order this hogback is composed of the Fall River, Fuson and Lakota formations which together are classed as the Inyan Kara group. This group forms the basal unit of the Cretaceous sediments and is underlain by the Jurassic Morrison formation, except on the southeastern flank of the Black Hills where the Unkpapa Sandstone replaces the Morrison formation. The Cretaceous black shales of the Skull Creek member of the Benton group lie conformably over the Fall River.

Structural deformation throughout the area is a result of the Laramidian Black Hills uplift. The regional dip varies with respect to position on the plunging southern nose of the elongate Black Hills dome. This southern end of the uplift is characterized by several major N-S trending anticlines and synclines giving rise to a fluted appearance.

Uranium production from the Inyan Kara group has been divided fairly equally between the Fall River and Lakota formations with only minor production from the Fuson. This group of sediments is composed generally of alternating sandstones, siltstones and claystones with a total thickness ranging between 350 and 550 feet.

LOCAL GEOLOGY

LITHOLOGY

Outcrop exposures in the vicinity of the Canyon Lode deposit allow a fairly accurate description of Fall River

lithology. The Fuson and Lakota formations are not exposed and therefore the following lithologic descriptions are based upon exposures in the surrounding areas. The Inyan Kara section has been divided into units that should be more or less consistent throughout the property. The units are described in descending order beginning with the uppermost member of the Fall River formation.

UNIT NO. 1
25-30 ft.

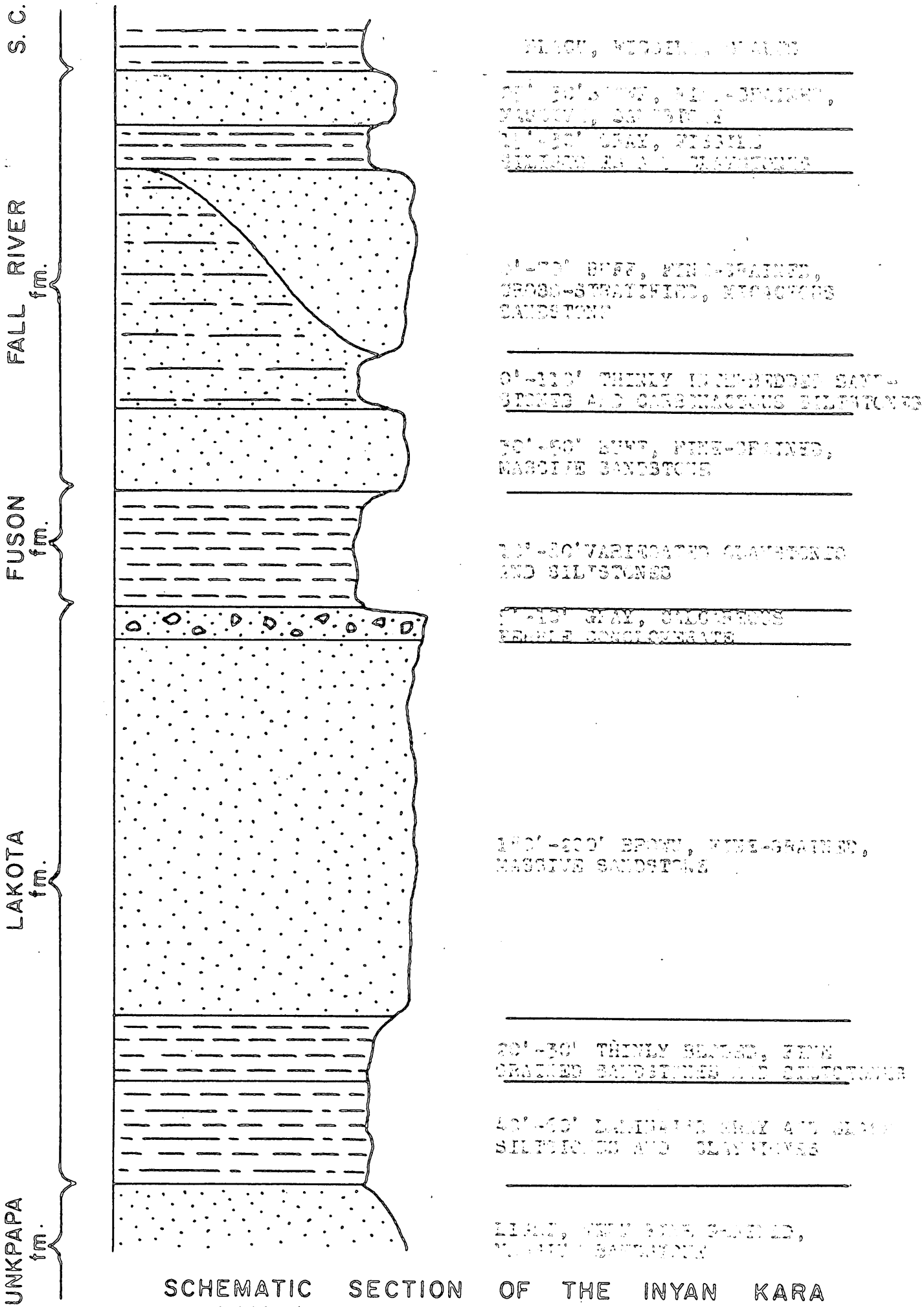
Buff to brown, fine to medium grained, massive, locally cross-stratified, quartz sandstone with minor amounts of altered feldspar grains. Average sorting and permeability throughout. This unit is quite resistant and is a cliff-former in the vicinity of the deposit. It forms the base for the flat inter-canyon surface between Mike and Cedar Canyons.

UNIT NO. 2
15-30 ft.

Gray to greenish gray, fissile siltstones and silty claystones with occasional thin, fine to very-fine grained quartz sandstone partings. This unit thickens to the northwest being approximately 20 ft. thick in the vicinity of the deposit.

UNIT NO. 3
0-70 ft.

Buff to light reddish brown, fine to medium grained, cross-stratified, micaceous, quartz sandstone. This unit is exposed



SCHEMATIC SECTION OF THE INYAN KARA VICINITY OF THE CANYON GROUP

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just above the deposit and extends through the westward trending nose just north of the deposit. It is again exposed just above the irrigation ditch in the western part of section 31, T 8 S, R 5 E. It is not evident in the rim of Cedar Canyon between these two exposures and is believed to be a paleo-stream channel truncating a portion of Unit No. 4. This channel sand is trending approximately N. 35° W.

UNIT NO. 4
0-110 ft.

Thinly enterbedded sandstones and siltstones. The sandstones are generally buff to brown, fine grained, thin to medium bedded consisting primarily of subround to subangular quartz grains and range in thickness from several inches to a maximum of 10 feet. The siltstones are generally black, finely laminated and fissile with abundant carbonaceous material. Occasional thin gray claystone partings are present within the siltstones. The Canyon Lode deposit is within 20 feet of the base of this unit. This unit pinches out about 2000 feet north of the deposit, the above and below

sandstones coalescing to form a thick sandstone member.

UNIT NO.5
30-50 ft.

Buff to brown, fine to medium grained, locally cross-stratified, quartz sandstone. On the rim, just below the deposit, this sandstone is quite resistant and a good cliff former. The base of this sandstone marks what is considered to be the Fuson-Fall River contact.

UNIT NO.6
10-80 ft.

Vari-colored, varigated claystones and siltstones. This unit represents the total Fuson section and in the vicinity of the mine is about 50 feet thick. This unit is very incompetent and is generally covered by debris where it should be exposed.

UNIT NO.7
2-5 ft.

Gray to dark gray, calcareous pebble conglomerate. This unit may be equivalent to the Minnewasta limestone which is present locally and considered a part of the Inyan Kara group.

UNIT NO.8
180-200 ft.

Yellow brown to red brown, very fine to medium grained, massive quartz sandstone with occasional thin siltstone and clay-

stone lenses. This sandstone is well exposed to the west and northwest and is quite consistant both in thickness and character throughout this area. The upper 5 feet of this unit is characteristically a red, fine-grained, calcareous quartz sandstone and has been used as a marker for the top of the Lakota Formation.

UNIT NO.9
20-30 ft.

Thinly interbedded, fine grained quartz sandstones and greenish gray siltstones. The sandstones are frequently calcareous.

UNIT NO.10
40-60 ft.

Thinly interbedded to laminated, gray to black siltstones and claystones lying directly upon the Unkpapa Sandstone. The Unkpapa Sandstone has here replaced the Morrison formation and is quite characteristically a very fine-grained,uniformly textured, massive, quartz sandstone usually exhibiting a bleached white color but often with pastel shades of yellow, red or purple.

The lithologic horizon described as unit No. 4 has been the only unit giving evidence of uranium mineralization in this area. It is a lenticular, interfingering type facies that should be present underlying all of the property except where cut through and eliminated through erosion.

The eastern end of the property will have a much thinner section of this unit due to the existence of the channel sandstone described as Unit No. 3. Exactly how much of Unit No. 4 is truncated by the channel is not known and will only be determined through drilling.

The thick massive sandstones of the Lakota formations have proven to be extensive uranium producers in the Edgemont district but are not exposed here to give any indication of uranium mineralization.

STRUCTURE

The average strike of the sediments on the Canyon group of claims is N 45°E with a dip between 2½ and 3 degrees to the southeast. The deposit lies on the gently rising western limb of the Coffee Flat syncline at a point approximately 7000 feet due west of its trough. The Coffee Flat syncline forms the declivity between the Cascade Anticline on the East and the Chilson Anticline on the west. Both anticlines are asymmetrical with steeply dipping western limbs and more gently dipping eastern limbs.

A local flexure just west of the deposit has reversed the strike of the sediments to about N55°W with a dip approaching 5° to the NE. Eastward through the deposit the strike swings back to the NE and the dip levels back to about 2½°. This slight variation in structure may have been important in the localization of uranium mineralization. In the highly productive Edgemont minning district which lies to the west, there seems to exist a definite relationship between are deposits and local flattenings of dip.

CANYON LODE DEPOSIT (BIG SIOUX MINE)

The Canyon Lode deposit is located roughly in the center of the Canyon Lode Claim. The exposed ore zone is at the base of a small side canyon trending N65°E from Cedar Canyon. Production to date consists of one shipment of 8.9 tons averaging 0.18% U_3O_8 and 0.34% U_2O_5. This shipment was made to the AS&R ore buying station at Edgemont, South Dakota on January 6, 1956.

The host rock is the thinly bedded, interfingering, lenticular member of the Fall River formation described before as Unit No. 4. About 2 vertical feet of ore grade material is exposed at the base of a bulldozed cut that has scoured out the bottom of the narrow canyon. The exposed ore can be traced for about 15 feet along the northern side of the cut and for about a 10 foot width south from this. The basal 1½ feet of the exposed ore zone consists of a dark brown, fine grained, massive, quartz sandstone. Abundant small pod-like concentratious of black manganese oxide coating the individual quartz grains gives a mottled appearance to this sandstone lens. The 4 feet above consists of very finely laminated light gray, very fine grained sandstones and black, carbonaceous siltstones. Above this are thinly bedded fine grained sandstones with frequent carbonaceous siltstone partings. These overlying sandstones also have high concentrations of manganese oxide plus occasional sulphide concretions that reach a maxiumum of approximately 2 inches in diameter.

The ore grade uranium mineralization is concentrated in the basal manganiferous sandstone and in the lower 1 foot

of the finely laminated material. The sandstone appears to have carnotite type mineralization as interstitial material but concentration does not seem heavy enough to account for the high assays obtained on selected samples (up to 1.85%U_3O_8). It is probable that one of the dark colored, less easily identified uranium minerals is also present finely disseminated throughout the sandstone. The high vanadium content points to the possibility of one of the dark colored vanadium ores like Corvusite or Rauvite which are quite common in the Edgemont district.

The lower 1 foot of the laminated material contains concentrations of secondary Carnotite type material as coatings along bedding planes. The 8.9 ton shipment was taken from the base of this pit and it is believed that the ore existing in the face should maintain the 0.18%U_3O_8 assay.

Twenty-seven holes have been drilled in an area surrounding the ore exposure. (See map). Of these 27 holes, 16 gave indications of ore grade material in the same horizon. An average thickness of 2.2 feet was sampled and assayed radiometrically with an average grade of 0.25%U_3O_8. The ore body as drilled to date covers an area roughly 50 feet x 100 feet and averages 2.2 feet in thickness. Using a factor of 15 cu. ft. of sandstone per ton, an inferred reserve of 650 tons is estimated. This must be inferred because of the absence of chemical assays on the drill hole cuttings. However it has been noted in this district that the ores are generally fairly

close to being in equilibrium with only slight variations in either direction. Discussions with both A E C and USGS personnel indicated that samples taken from the exposure on this property were close to or in equilibrium between chemical and radiometric values.

In addition to the known deposit there exist several anomalous areas along the rim to the south. The first is about 300 feet from the deposit and the other is 150 feet from that. Both are located in the same stratigraphic horizon and have not been thoroughly investigated as yet.

CONCLUSIONS

The Canyon group of five claims contains the full section of Inyan Kara sediments including all of the known uranium producing horizons. The most important of these, the thinly bedded Fall River member described as Unit No.4 lies at shallow depths over the greater part of the property. The presence of a producing deposit plus several known anomalies indicates the high potential of this horizon. This potential is increased considerably with any local flattening of dip. Very close structural control should be exercised in future drilling. In the Edgemont district to the west it appears that the areas of greatest favorability are on the flat portions of structures such as monoclinal terraces and anticlinal noses.

The presence of the paleo-stream channel described as lithologic Unit No.3 is an interesting feature and could possibly have a bearing upon uranium precipitation.

From outcrop evidence this channel attains a maximum thickness of approximately 70 feet and truncates the greater portion if not all of the ore bearing unit. Assuming that the final concentration of the uranium minerals was accomplished through the varied activity of circulating ground water, the truncation of any sandstone lens in Unit No. 4 would provide an ideal loci for concentration. The controlling factor would be of coarse an abrupt blocking or diversion of normal down-dip flow. This would infer a physical difference between the two sandstones, the channel sandstone being less permeable or perhaps more highly cemented. This idea could only be investigated through close examination of drill hole data.

The possibility of channel type ore deposits similar to those of the Colorado Plateau region certainly exists. Although the Edgemont District is not noted for this type of deposit there is no reason to eliminate the possibility. Actually very little work has been done in the area to investigate known channels. The similarity between the Salt Wash Member of the Morrison Formation in the ColoradoPlateau is suggestive of similar ore controls. The control of uranium ore deposition by channeled type lithology in the plateau region is fairly well established. The presence of the paleo-stream channel (Unit No. 3) should increase the potential of this property greatly.

RECOMMENDATIONS

The depth of the most favorable horizon precludes the use of drill holes to obtain the necessary geologic

information. The drilling should be grouped into 3 separate stages.

1. Widely spaced drilling to outline gross geologic features.
2. Closely spaced drilling in areas of greatest favorability.
3. Offset drilling outlining possible ore bodies.

The first stage of drilling should attempt to locate the exact position of the truncation of the ore bearing unit and at the same time outline the margins and central portion of the channel sandstone. It is suggested that 4 rows of drill holes trending N55 E be placed as indicated on the map at the end of the report. The holes should be spaced no further than 300 feet apart to insure adequate correlation. Close control should be kept upon structural conditions as drilling progresses. A particular horizon should be chosen as a marker upon which to base structure contours. All holes should penetrate at least to the base of the ore bearing unit which should average about 160 feet in depth. If possible several holes should be drilled to the Unkpapa contact in order not to pass up the possibility of ore grade material within the Lakota Sandstones.

The placing of second stage holes would be based upon the results of the first stage. Several rows of holes would be placed parallel to the trend of the truncation. The holes would be more closely spaced in order to thoroughly explore the possibilities of uranium mineralization. If at this time any favorable structural conditions have been

outlined, several holes should be expended to check the possibility of uranium concentration in these areas.

In all of the drilling the samples should be closely watched for all of the features that have been considered favorable for the concentration of uranium minerals. Such things as abnormal content of carbonaceous or trashy material, abrupt changes in type of cememtation, porosity or permeability, a sharp pinchout or thinning of a horizon could be favorable indicators. The variety of sedimentary features exhibited throughout the Inyan Kara group of sediments tends to increase the difficulties in attempting to establish basic ore guide criteria. This differential lithology in itself is probably the major factor in the localization of ore deposits. It is suggested that the drilling be supervised by a geologist in order to more competently use the information gained.

(4)

RECEIVED
JUN 13 1956

ASSIGNMENT OF MINING LEASE AND AGREEMENT.

WE, MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, all of Hot Springs, County of Fall River, State of South Dakota, for and in consideration of One Dollar and other good and valuable consideration, do hereby assign, transfer and set over unto BIG SIOUX URANIUM & MINERAL COMPANY, a corporation, of Sioux Falls, South Dakota, P.O., all our right, title and interest in and to that certain Mining Lease and Agreement executed by Abram E. McClure, as Lessor, and the undersigned, as Lessees, whereby the said Lessor leased and let to the said Lessees, under the terms and conditions therein stated, the following described real property situate in the County of Fall River and State of South Dakota, to-wit:

> The Southwest quarter (SW¼) of Section Twenty-nine (29), and the Northwest quarter (NW¼) of Section Thirty-two (32), in Township Eight (8) South, Range Four (4) East of the Black Hills Meridian, except overriding Royalty of 1% retained by Francis & Mary M. Michaud, and 1% retained by Melvin Hanson and Jessie Hanson.

which Mining Lease and Agreement bears date the 8th day of October, 1954.

Dated this first day of November, 1955.

Melvin Hanson
Jessie Hanson
Francis Michaud
Mary M. Michaud

STATE OF SOUTH DAKOTA)
) ss.
County of Pennington.)

On this first day of November, 1955, before me, the undersigned officer, a Notary Public within and for said County and State, personally appeared MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, known to me to be the persons who are described in and who executed the within instrument, and acknowledged to me that they executed the same for the purposes therein contained.

My commission expires

Notary Public.

33336

Nellie Thomas et al

TO

Big Bend Irrigation

Manual C.

STATE OF SOUTH DAKOTA)
COUNTY OF FALL RIVER) SS

FILED FOR RECORD

23 DAY OF Nov 19 35

AT 9:00 A.M. AND RECORDED IN

BOOK 38 MISC. 438-439

Dorothy N. Montgomery

REGISTER OF DEEDS

FEE $

Where Recorded Return

TO

RECORDED ✓

COMPARED ✓

INDEXED ✓

①

Note: ① and ② form canyon group

RECEIVED
JUN 13 1956

M I N I N G D E E D.

THIS INDENTURE, Made this first day of November, 1955, between MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, all of Hot Springs, County of Fall River, State of South Dakota, parties of the first part, and BIG SIOUX URANIUM & MINERAL COMPANY, a corporation, of Sioux Falls, South Dakota, P.O., party of the second part;

WITNESSETH: That the said parties of the first part, for and in consideration of the sum of One Dollar and other good and valuable consideration, to them in hand paid by the said party of the second part, the receipt whereof is hereby acknowledged, have granted, bargained and sold, and by these presents do grant, bargain and sell unto the said party of the second part and to its successors and assigns, the following described lode mining claims situated in the County of Fall River and State of South Dakota, to-wit:

> NIGGAR-HILL LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 185;
>
> HANS LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 188.
>
> THE CANYON LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 189;
>
> all of which claims are located in Section Twenty-five (25), Township Eight (8) South, Range Four (4) East of the Black Hills Meridian;

together with all the veins, dips, spurs and angles, and also all the metals, ores, veins, ledges, lodes, leads and mineral-bearing rock, earth and material therein or apexing therein or thereunder, and the rights, privileges and franchises thereto incident, appendant and appurtenant, or therewith usually had

and enjoyed; and also all and singular the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining, and the rents, issues and profits thereof; and every part and parcel thereof with the appurtenances; subject to an overriding royalty owned by Everett Hill and Marie Hill of twelve and one-half per cent (12½%), and a one-half of one per cent (½%) overriding royalty owned by Francis Michaud and Mary M. Michaud, and a one-half of one per cent (½%) overriding royalty owned by Melvin Hanson and Jessie Hanson.

TO HAVE AND TO HOLD, all and singular, the said premises, together with the appurtenances and privileges thereto incident, unto the said party of the second part, its successors and assigns, forever.

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

Melvin Hanson
Jessie Hanson
Francis Michaud
Mary M. Michaud

* * *

STATE OF SOUTH DAKOTA)
) ss.
County of Pennington.)

On this first day of November, 1955, before me, the undersigned officer, a Notary Public within and for said County and State, personally appeared MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, known to me to be the persons who are described in and who executed the within instrument, and acknowledged to me that they executed the same for the purposes therein contained.

My commission expires
October 14 - 1957

G E Reimers
Notary Public.

33335

Transmission and

TO

Rapid Transmission

Mineral Co.

STATE OF SOUTH DAKOTA
COUNTY OF FALL RIVER } SS

FILED FOR RECORD

26 DAY OF April 19 55

AT 9:00 M. AND RECORDED IN

BOOK 38 MISC PAGE 437-438

Bertha R. Montgomery

COUNTY CLERK

FEE $

Mail Original Return

TO

RECORDED ✓

COMPARED ✓

INDEXED ✓

(2)

RECEIVED
JUN 13 1956

ASSIGNMENT OF MINING LEASE AND AGREEMENT.

WE, MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, all of Hot Springs, County of Fall River, State of South Dakota, for and in consideration of One Dollar and other good and valuable consideration, do hereby assign, transfer and set over unto BIG SIOUX URANIUM & MINERAL COMPANY, a corporation, of Sioux Falls, South Dakota, P.O., all our right, title and interest in and to that certain Lease and Agreement entered into by and between Everett Hill and Marie Hill, the Lessors, and Francis Michaud and Melvin Hanson, the Lessees, on March 4, 1955, whereby the said Lessor leased and let unto the said Lessees, under the terms and conditions therein stated, the following described real property situate in the County of Fall River and State of South Dakota, to-wit:

Nigger Lode Mining Claim recorded in Book 35 Miscellaneous in the Office of Register of Deeds, Fall River County, South Dakota at page 185, and (2)

Side Hill Lode Mining Claim recorded in Book 35 Miscellaneous in the Office of Register of Deeds, Fall River County, South Dakota at page 189, except over-riding royalty of ½ of 1% retained by Francis Michaud and Mary M. Michaud, and overriding royalty of ½ of 1% retained by Melvin Hanson and Jessie Hanson. (2)

IN WITNESS WHEREOF THE parties hereto have signed this instrument this 1st day of November, 1955, in Rapid City, South Dakota.

Melvin Hanson
Jessie Hanson
Francis Michaud
Mary M. Michaud

STATE OF SOUTH DAKOTA)
) ss.
County of Pennington.)

On this first day of November, 1955, before me, A. E. Reimers, a Notary Public within and for said County and State, personally appeared MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, known to me to be the persons who are described in and who executed the within and foregoing instrument, and acknowledged to me that they executed the same for the purposes therein contained.

My commission expires , 1957.

A. E. Reimers
Notary Public.

33339

Melvin Thomas et al

To

Big Sioux Pipeline

Municipal a.

STATE OF SOUTH DAKOTA
COUNTY OF FALL RIVER : SS

FILED FOR RECORD

23 DAY OF Nov 1933

AT 9:00 A.M. RECORDED IN

BOOK 38 MISC 435-436

Beulah N. Montgomery

REGISTER OF DEEDS

FEE $ 10.00 pd

J. H. Bullers Jr.

Rapid City S.Dak.

RECORDED ✓

COMPARED ✓

INDEXED J.

(3)

RECEIVED
JUN 13 1956

MINING DEED.

THIS INDENTURE, Made this first day of November, 1955, between MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, all of Hot Springs, County of Fall River, State of South Dakota, parties of the first part, and BIG SIOUX URANIUM & MINERAL COMPANY, a corporation, of Sioux Falls, South Dakota, P.O., party of the second part;

WITNESSETH: That the said parties of the first part, for and in consideration of the sum of One Dollar and other good and valuable consideration, to them in hand paid by the said party of the second part, the receipt whereof is hereby acknowledged, have granted, bargained andsold, and by these presents do grant, bargain and sell unto the said party of the second part and to its successors and assigns, the following described lode mining claims situate in Section Thirty-four (34), Township Eight (8) South, Range Four (4) East of the Black Hills Meridian, in the County of Fall River and State of South Dakota, to-wit:

FLAT LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 232.

SUNDAY LODE NO. 1 MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 234.

JIM LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County, in Book 35 of Miscellaneous Records, at page 237.

HULL LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County, in Book 35 of Miscellaneous Records, at page 233.

HANSON NO. 1 LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 235.

HANSON LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 235.

NUMBER FIVE LODE, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 236.

THE PETE LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 237.

THE NUMBER SEVEN LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 236.

THE SUNDAY LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 233.

THE SUNDAY NUMBER TWO LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 234.

together with all the veins, dips, spurs and angles, and also all the metals, lodes, veins, ledges, lodes, leads and mineral-bearing rock, earth and material therein or apexing therein or thereunder, and the rights, privileges and franchises thereto incident, appendant and appurtenant, or therewith usually had and enjoyed; and also all and singular the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining, and the rents, issues and profits thereof; and every part and parcel thereof with the appurtenances; expressly excepting from this conveyance an overriding royalty of one per cent (1%) owned by Francis Michaud and Mary M. Michaud, and an overriding royalty of one per cent (1%) owned by Melvin Hanson and Jessie Hanson.

TO HAVE AND TO HOLD, all and singular, the said premises, together with the appurtenances and privileges thereto incident, unto the said party of the second part, its successors and assigns,

forever.

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

Melvin Hanson
Jessie Hanson
Francis Michaud
Mary M. Michaud

* * *

STATE OF SOUTH DAKOTA)
) ss.
County of Pennington.)

On this first day of November, 1955, before me, the undersigned officer, a Notary Public within and for said County and State, personally appeared MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, known to me to be the persons who are described in and who executed the within instrument, and acknowledged to me that they executed the same for the purposes therein contained.

My commission expires
July 1, 1957
(SEAL)

J E Reinerse
Notary Public.

33337

Melvin Thomas et al

TO

Richard Thomas

Thomas C.

STATE OF SOUTH DAKOTA
COUNTY OF FALL RIVER } SS

FILED FOR RECORD
23 DAY OF April 1993
AT 9:00 A. M. AND RECORDED
IN BK 38 MISC PAGE 39-140
Beverly N. Montgomery
REGISTER OF DEEDS

FEE $ 10.00

J. H. Bottum Jr.
Rapid City, S.D.

RECORDED ✓
COMPARED ✓
INDEXED ✓

Surname copy

700

Murphy
Lamb
Kielsgaard
Selfridge

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

Big Sioux Uranium and Mineral Company
1209 South Main Avenue
Sioux Falls, South Dakota

Re: Docket No. DMEA-4331 (Uranium)
Canyon Group, et al.
Fall River County, South Dakota

Gentlemen:

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

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

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

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

Sincerely yours,

C. O. Mittendorf

Administrator

FMMurphy/gla
10-5-56
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. JECrawford, 3643
THKiilsgaard, 5224
JOHosted, 3210, GSA
Code 700
Mr. Murphy
DMEA Field Team, Region III (2)

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

DOCKET COPY

Murphy
Ells

October 5, 1956

Summary of Proposed Project

Object: Denial of application for exploration aid.

Docket No.: DMEA-4331

Commodity: Uranium

Applicant: Big Sioux Uranium and Mineral Company
1209 South Main Avenue
Sioux Falls, South Dakota

Property: Lease on SW¼ sec. 29 and NW¼ sec. 32 (McClure lease); the Cedar Canyon group of 5 claims in sec. 25; and 11 claims in a group in sec. 34, all in T. ~~15~~ 8 South, R. 4 E., BHM, Fall River County, South Dakota.

Date of Application: June 8, 1956

Amount of Application: $28,660.00 (see estimated costs)

Referred to Field Team: July 9, 1956

Field Examination made: August 14, 1956

Field Team Report recd.: September 17, 1956

Work Proposed: A two stage drilling project consisting of about 7,400 feet of non-core and 300 feet of core drilling in each stage.

Estimated Costs of Project:

Access roads and drill sites, bulldozer 10 days @ $14	$ 140.00*
6400 feet non-core drilling @ $1.10/ft.	7,040.00
8400 " " " " @ $1.25/ft.	10,500.00
400 " core " @ $2.35/ft.	940.00
200 " " " @ $2.90/ft.	580.00
Standby, easing, miscellaneous	2,000.00
Sampler, 120 days @ $12.00/day	1,440.00
Consultant and geologist	2,000.00

Analytical work, 200 samples @ $3.50/each	700.00
Postage and handling samples	100.00
Total	$25,440.00

*Application-Phase I - (5 days @ $14.00 — $1,680.00 or $3,360.00 for bulldozer in both stages making estimated cost $28,660.00, (as totaled by the Applicant).

Excerpts from Field Team Report:

The consolidated rocks exposed on the properties are a series of sandstones, siltstones, and mudstones of the Cretaceous Fall River and Lakota formations (Inyan Kara group).

Occurrences of uranium mineralization are common in the Inyan Kara group to the north and west of the claims. However, only a few of these occurrences have had material which warranted mining or exploration and only two — the Gould and Accidental mines — have shipped any significant amounts of ore. The Gould mine, which shipped over 10,000 tons of ore mined from the Fall River formation, is by far the largest mine and is the only one producing at present. In the Accidental, now abandonded, a 500-ton ore body was mined from the Lakota formation. Two other properties in the area are the McCloud, in the Lakota formation and the Livingston, in the Fall River, both of which are now being developed.

On the Canyon Lode claim in the Cedar Canyon group of claims a small deposit (about 9 tons - 0.18% U_3O_8) was mined and shipped. Twenty-seven holes were drilled around this occurrence. Sixteen of the holes indicated a 650 ton ore body 2.2 feet thick and averaging 0.25% U_3O_8, in the same horizon as the mined ore body.

Although uranium mineralization is present in the Fall River formation in this area, the deposits are small and probably widely scattered.

Nearly the full section of the Inyan Kara lithology is exposed on all three claim groups. However, no significant mineralization was noted in either the Fall River or Lakota formations on either the McClure lease or the 11 claim lease. The AEC drilled one hole on the McClure lease. This hole penetrated the full Inyan Kara series without encountering uranium mineralization, nor were any radioactive anomalous zones encountered.

The field examiners and Field Team recommend the application be denied for the following reasons:

(1) There are no known structures within the proposed exploration areas that might serve to localize or concentrate uranium-bearing solutions.

(2) There appears to be no textural or lithologic discontinuities within the Inyan Kara rocks, other than the facies change in the Lakota formation, that may form a favorable host rock for significant ore deposition.

(3) There are no known large radioactive anomalies, "carbonatized" or bleached zones, or other features that may indicate a large sub-surface deposit.

(4) Only one small uranium deposit is known to occur on the claims. Larger, but still relatively small deposits, occur to the northwest in a distinctly different geological environment.

(5) Canyons which form ideal "exploration trenches" through the entire Inyan Kara group fail to disclose any significant uranium mineralization.

Commodity Members' Comments:

U. S. Geological Survey, W. P. Williams, September 21, 1956.

Mr. Williams notes that the examining team convincingly point out in their report that the Applicant's property is ill suited for further exploration and concurs in their recommendation to deny the application.

U. S. Bureau of Mines, J. E. Crawford, October 2, 1956

Mr. Crawford concurs in the Field Teams denial recommendation.

Rare and Miscellaneous Metals Division, F. M. Murphy, October 5, 1956

The conclusions reached by D. H. Richter, USGS, and Carl Belser, USBM, in their "Report of Examination" relating to the subject groups of claims, are well justified in the text.

Conclusions and Recommendations:

This Division agrees with the field examiners' conclusions and concurs in the Field Team's recommendation to deny the application.

Ernest W. Ellis

Ernest W. Ellis

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

RECEIVED
OCT - 3 1956

Date 10/2/56

DMEA Docket No. 4331
DMEA Contract No.
Commodity Uranium
Name of applicant Big Sioux Uranium & Mineral Co.
Name of property Canyon Group
Location of property Fall River County, South Dak.
Estimated cost of project $28,660

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee
From: John E. Crawford, Bureau of Mines Member
Uranium Commodity Committee
Subject: Review of Field Team Report
(Application, Field Team Report, etc.)

1. Date of subject document: 9/11/56. 2. Date received by reviewer: 9/24/56.

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

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

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

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

7. Explain items marked yes above:

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

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

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

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

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

RECEIVED
OCT - 3 1956

Date 10/2/56

DMEA Docket No. 4331
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5. Information available on past production: Yes ☐, No ☐.

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

7. Explain items marked yes above:

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

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

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

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

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

RECEIVED
OCT - 3 1956

Date 10/2/56

DMEA Docket No. 4331
DMEA Contract No.
Commodity Uranium
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Name of property Canyon Group
Location of property Fall River County, South Dak.
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From: John E. Crawford, Bureau of Mines Member
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Subject: Review of Field Team Report
(Application, Field Team Report, etc.)

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

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

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

7. Explain items marked yes above:

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

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

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

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

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

RECEIVED
OCT - 1 1956

224 New Customhouse
Denver 2, Colorado

September 26, 1956

Mr. Elgin E. Poole
Secretary-Treasurer
Big Sioux Uranium and Mineral Co.
1209 South Main Avenue
Sioux Falls, South Dakota

Re: Docket No. DMEA-4331 (Uranium)
Canyon Group, et al.
Fall River County, South Dakota

Dear Mr. Poole:

This will acknowledge receipt of your letter dated September 24, 1956. The report of examination on the captioned property has been forwarded the Washington Office, DMEA. They will advise you at an early date of their final action on this application for DMEA aid.

Yours very truly,

W. M. TRAVER

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

HMC:ytl

cc: Sec. Op. Comm. (2)
Harshman
Shaw (2)
Docket 4331
Chron.

9/24/56 gla

IN REPLY REFER TO:

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

RECEIVED
SEP 21 1956

September 21, 1956

Memorandum

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

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

Subject: Review of field examination report, DMEA 4331, Big Sioux Uranium and Mineral Company, Canyon claims, Fall River County, South Dakota.

The examining team convincingly point out in their report that the applicant's property is ill suited for further exploration. Principal reasons are that favorable geologic structures and a favorable ore host rock are absent, anomalous radioactivity is unknown, and the known ore deposits are small and scattered.

One bulldozer trench and 27 drill holes on the property discovered a small ore body a few hundred tons in size. Probably no better results could be expected from additional exploration.

Because of the many adverse features of the property and the size of the expected ore bodies, I am in agreement with the recommendations of the field examiners for denial of the application.

W P Williams

W. P. Williams

IN REPLY REFER TO:

RECEIVED
SEP 21 1956

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

September 21, 1956

Memorandum

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

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

Subject: Review of field examination report, DMEA 4331, Big Sioux Uranium and Mineral Company, Canyon claims, Fall River County, South Dakota.

The examining team convincingly point out in their report that the applicant's property is ill suited for further exploration. Principal reasons are that favorable geologic structures and a favorable ore host rock are absent, anomalous radioactivity is unknown, and the known ore deposits are small and scattered.

One bulldozer trench and 27 drill holes on the property discovered a small ore body a few hundred tons in size. Probably no better results could be expected from additional exploration.

Because of the many adverse features of the property and the size of the expected ore bodies, I am in agreement with the recommendations of the field examiners for denial of the application.

WPWilliams:iml
G-9/21/56

W. P. Williams

cc: Director's reading, 4212
Branch reading, 4212
DMEA(3)
Docket file
J. E. Crawford, 3641
J. O. Hosted, 3210

IN REPLY REFER TO:

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

RECEIVED
SEP 21 1956

September 21, 1956

Memorandum

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

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

Subject: Review of field examination report, DMEA 4331, Big Sioux Uranium and Mineral Company, Canyon claims, Fall River County, South Dakota.

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9/20/56 gla

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SEP 17 1956

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

224 New Customhouse
Denver 2, Colorado

September 14, 1956

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Joint Report of Examination, Docket No. DMEA-4331 (Uranium)
Big Sioux Uranium and Mineral Company
(Canyon Group, et al.), Fall River County, South Dakota

Enclosed are the original and three copies of a joint engineering and geologic report of examination on subject property.

The examiners conclude that the proposed exploration will not result in the discovery of a significant amount of uranium ore, and they recommend that the application be denied. We concur in this recommendation.

DMEA Field Team, Region III

W. M. Traver

By W. M. Traver
Executive Officer

Encl.

Reviewed by
DMEA OPERATING COMMITTEE
9-19-56
(date).

TRANSMITTED SEP 14 1956

IN REPLY REFER TO:

DMEA

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

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

September 12, 1956

Memorandum

RECEIVED
SEP 17 1956

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shaw
E. N. Harshman

Subject: DMEA Docket 4331 (Uranium), Big Sioux Uranium and Mineral Company (Canyon group, et al.), Fall River County, South Dakota

Enclosed are the original and nine copies of a joint report of examination by Donald H. Richter, U. S. Geological Survey, and Carl Belser, U. S. Bureau of Mines, covering their examination of the subject property.

The applicant proposes to explore for uranium by drilling on three claim groups in Fall River County, South Dakota. His estimated cost of the program is $28,660.

The examiners conclude that the proposed exploration will not result in the discovery of significant deposits of uranium ore and they recommend that the application for exploration assistance, DMEA Docket 4331, be denied.

We concur with the conclusions and recommendations.

John F. Shaw
Superintendent of the Denver
Experiment Station

E. N. Harshman
Member, Field Team

Reviewed by
DMEA OPERATING COMMITTEE
9-19-56
(Date)

Enclosures (10)
ENHarshman:mp

TRANSMITTED

SEP 14 1956

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

RECEIVED

SEP 17 1956

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

CONFIDENTIAL

NOT FOR PUBLIC INSPECTION OR QUOTATION

DMEA 4331

Big Sioux Uranium and Mineral Company, Inc.

Cedar Canyon and Eleven Claim Groups, and McClure Lease

Fall River County, South Dakota

Uranium

Joint Engineering and Geological Report

by

Donald H. Richter, Geologist
Geological Survey

Carl Belser, Mining Engineer
Bureau of Mines

September 11, 1956

Reviewed by
DMEA Geologic Consultants
9-19-56
(date)

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RECEIVED
SEP 17 1956

DMEA 4331

BIG SIOUX URANIUM AND MINERAL COMPANY, INC.
CEDAR CANYON AND ELEVEN CLAIM GROUPS, AND McCLURE LEASE
FALL RIVER COUNTY, SOUTH DAKOTA

INTRODUCTION AND SUMMARY

Big Sioux Uranium and Mineral Company, Inc., 1209 South Main Avenue, Sioux Falls, South Dakota, on June 8, 1956, made application to the Defense Minerals Exploration Administration for aid in a two-stage drilling project consisting of 15,400 feet of core and non-core drilling at an estimated cost of $28,660.

The properties were examined on August 14, 1956, by an examining team from the Bureau of Mines and the Geological Survey.

The properties consist of five unpatented mining claims in section 25, 11 unpatented mining claims in section 34 and 320 acres of fee land in the SW 1/4 section 29 and the NW 1/4 section 32; all in T. 8 S., R. 4 E., Black Hills meridian, Fall River County, South Dakota. The properties are from 11 to 16 miles southwest of Hot Springs, South Dakota. The altitude ranges from about 3,300 to 3,600 feet.

The consolidated rocks exposed on the properties are a series of Cretaceous sandstones, siltstones, and mudstones of the Fall River and Lakota formations (Inyan Kara group). Interfingering of the different rock types is common and the lithologic sequence

changes throughout the area. The attitude of the strata is relatively consistent. The strike is generally northeast and the dip ranges from 1° to 4° SE. Uranium mineralization occurs north and west of the properties, but significant amounts of ore have been produced from only two mines, the Gould and Accidental.

In the Cedar Canyon claim group 8.9 tons of ore averaging 0.18 percent U_3O_8 have been mined from a sandstone-siltstone unit in the Fall River formation. Drilling in the vicinity of the deposit has outlined a possible 650-ton ore body. Two other radioactive areas are said to occur on the claim group, but they apparently contain no significant uranium mineralization.

On the Eleven claim group and the McClure lease a few radioactive anomalies are reported but, as in the case of the Cedar Canyon claims, no uranium mineralization has been observed.

Government participation in the applicant's proposed exploration program is not recommended because, (1) there are no known structures or lithologic discontinuities that might serve to localize uranium deposition, (2) no large radioactive anomalies or altered zones indicative of subsurface deposits are present, (3) only one small uranium deposit has been found on the claims, and (4) canyons which form ideal "exploration trenches" through the Inyan Kara rocks fail to disclose significant uranium mineralization.

ACKNOWLEDGMENTS

The examining team was accompanied by Manas Veeraburus, I.C.A. geologist, Edwin C. Post, U.S.G.S. geologist, and Francis Michaud who represented the applicant.

Memorandums of N. E. Nelson and John E. Crawford were noted.

Mr. Ray Barkeley, geologist for the Atomic Energy Commission in Hot Springs, South Dakota, was consulted at the time of the examination.

LOCATION, TOPOGRAPHY, AND CLIMATE

The property consists of 5 unpatented mining claims in section 25, 11 unpatented mining claims in section 34, and 160 acres of fee land in the SW 1/4 section 29, 160 acres of fee land in the NW 1/4 section 32; all in T. 8 S., R. 4 E., Black Hills meridian, Fall River County, South Dakota. (fig. 1)

The Cedar Canyon claim group can be reached by traveling southwest from Hot Springs over South Dakota Highway 87 a distance of 10.5 miles, thence 1 mile northwest over a poor access road. The McClure lease and Eleven claim groups can be reached by traveling northeast from Edgemont over U. S. Highway 18 a distance of 12 miles, thence southeast over a fair dirt road 3 and 6 miles, respectively.

Altitudes of the properties range from about 3,300 to 3,600 feet.

Labor and supplies can be obtained from Edgemont or Hot Springs, and an ore buying depot is maintained at Edgemont.

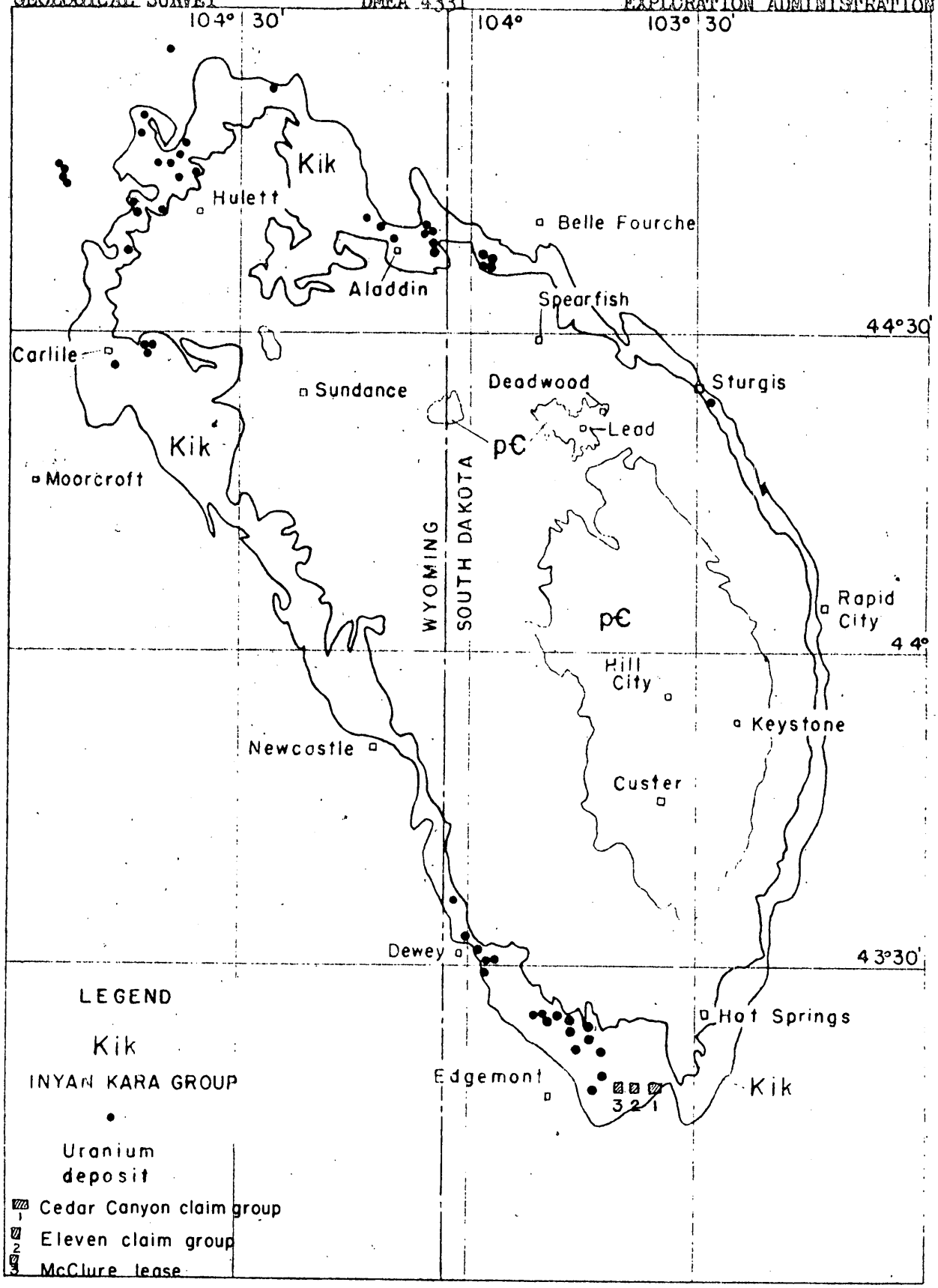

FIGURE I. INDEX MAP OF THE BLACK HILLS SHOWING THE HOLDINGS OF THE BIG SIOUX URANIUM AND MINERAL COMPANY, INC.

The Burlington railroad passes through Edgemont, and Hot Springs is on the Chicago and Northwestern railroad.

HISTORY AND PRODUCTION

The claims were located late in 1954. Access roads were built on the Cedar Canyon group by Melvin Hanson in 1955, and a small amount of ore was shipped. Discovery pits were bulldozed on the Eleven claim group.

Total production amounts to 8.9 tons averaging 0.18 percent U_3O_8 and 0.34 percent V_2O_5. This production was made from an exposed ore zone on the Canyon claim.

OWNERSHIP AND EXTENT

The SW 1/4 section 29 and the NW 1/4 of section 32, T. 8 S., R. 4 E., Black Hills meridian, are assessed to Abram E. McClure. A United States patent was issued on this land on March 1, 1921, and is recorded in Book 7, page 576, of the records of Fall River County, South Dakota. The mineral rights were leased on October 8, 1954, to Melvin and Jessie Hanson, and Francis and Mary M. Michaud. This lease was transferred to the Big Sioux Uranium and Mineral Company, Inc., on November 1, 1955. The lease transfer is recorded in Book 38, pages 438 and 439.

The following claims are recorded in the Office of the Register of Deeds, Fall River County, South Dakota:

Claim	Book	Page	Location Date	Locator
Cedar Canyon group				
Niggar	35	185	9/27/54	Everett and Marie Hill
Niggar Hill	35	185	"	Francis Michaud and Melvin Hanson
Hans	35	188	"	" " " " "
Canyon	35	189	"	" " " " "
Side Hill	35	189	"	Everett and Marie Hill
Eleven claim group				
Flat	35	232	11/18/54	Jessie Hanson
Hull	35	233	"	Mary M. Michaud
Sunday	35	233	11/17/54	Francis Michaud
Sunday No. 1	35	234	11/17/54	Melvin Hanson
Sunday No. 2	35	234	"	Francis Michaud
Hanson	35	235	"	Melvin Hanson
Hanson No. 1	35	235	"	" "
Number Five	35	235	"	Francis Michaud
Number Seven	35	236	"	" "
Jim	35	237	"	Melvin Hanson
Pete	35	237	"	Francis Michaud

The Niggar Hill, Hans, and Canyon claims were transferred by Everett and Marie Hill to Melvin and Jessie Hanson and Francis and Mary M. Michaud who, on November 1, 1955, transferred the claims to the Big Sioux Uranium and Mineral Company, Inc. The transfer carries a 13-1/2 percent royalty on production and is recorded in Book 38, pages 437 and 438.

The Flat, Sunday, Sunday No. 1, Sunday No. 2, Jim, Hull, Hanson, Hanson No. 1, Peter, Number Five, and Number Seven claims were transferred to the Big Sioux Uranium and Mineral Company, Inc., on November 1, 1955. The transfer calls for a two-percent production royalty and is recorded in Book 38, pages 439 and 440.

The Niggar and Side Hill claims were transferred on November 1, 1955, by Melvin and Jessie Hanson and Francis and Mary M. Michaud to the Big Sioux Uranium and Mineral Company, Inc. The transfer carried a two-percent royalty on production and is recorded in Book 38, pages 435 and 436.

PRESENT STATUS

Exploration and development

Exploration consists of a bulldozer cut on the Canyon claim and 27 drill holes in the vicinity of this cut. A survey for radioactivity has discovered weak anomalies on the McClure lease, the Cedar Canyon group, and the Eleven claim group.

Mining and milling equipment and other facilities

There is no mining or milling equipment on the property. Other facilities consist of a few access roads.

GEOLOGY AND URANIUM DEPOSITS

General statement

The consolidated rocks exposed on the holdings of the Big Sioux Uranium and Mineral Company, Inc., consist of a series of lower Cretaceous sedimentary rocks known as the Inyan Kara group. This group, which forms one of the outer peripheral hogbacks to the Black Hills, is now divided into two formations - the Fall River and the Lakota. The Fall River or uppermost member of the Inyan Kara consists of a series of sandstones, mudstones, and interbedded sandstones and siltstones. The Lakota formation, which now includes the old Fuson formation, is primarily a series of sandstones and mudstones. Interfingering of the different rock types within these formations is common, and the lithologic sequence changes frequently throughout the area. The Inyan Kara overlies the Jurassic Morrison formation in the southwest part of the Black Hills and the equivalent Unkpapa sandstone in the areas described here. Thin deposits of Quaternary terrace gravels and alluvium locally cover the Cretaceous rocks.

Structural deformation throughout the area is a result of the Laramidian Black Hills uplift and the attitude of the strata depends upon their position with respect to the elongate Black Hills dome. In the areas examined in the southern Black Hills, the

regional strike is NE, and the dip ranges from 1° to 4° SE. Although a number of north-trending anticlines and monoclines are superimposed on this regional homocline, none were observed in the areas investigated.

Occurrences of uranium mineralization are common in the Inyan Kara group to the north and west of the examined claims. However, only a very few of these occurrences have had material which warranted mining or exploration and only two - the Gould and Accidental mines - have shipped any significant amounts of ore. The Gould mine, from which over 10,000 tons of carnotite-type ore has been shipped from the Fall River formation, is by far the largest mine in the area, and is the only producer. In the Accidental, now abandoned, a 500-ton ore body was mined from the Lakota formation. Two other properties worthy of mention in the area are the McCloud, in the Lakota formation, and the Livingston, in the Fall River, both of which are now undergoing development.

Cedar Canyon claim group

The Cedar Canyon claim group consists of the Hans, Side Hill, Canyon, Niggar, and Niggar Hill lode mining claims in the SE 1/4 sec. 25, T. 8 S., R. 4 E., Fall River County, South Dakota (figs. 1 and 2).

The rocks of the Inyan Kara group are well exposed on the five claims of the Cedar Canyon claim group; only the lowermost unit

of the Lakota formation is absent. The rock units present, from the top of the Fall River formation downward, are as follows:

Fall River formation

(1) Brown, fine-grained massive sandstone, 25 to 30 feet thick.

(2) Gray, fissile mudstone, with minor siltstone, 15 to 30 feet thick. (Buff, fine-grained micaceous channel sandstone has filled the scours in unit 3. It is as much as 70 feet thick.)

(3) Light- to dark-brown thinly interbedded sandstones and carbonaceous siltstones 20 to 110 feet thick. Upper part of this unit usually consists of a 10- to 20-foot thick section of brown sandstone.

Lakota formation

(4) Buff, medium-grained massive sandstone with a grit and conglomerate base, 30 to 50 feet thick.

(5) Brown mudstones, probably equivalent to the old Fuson formation, 10 to 80 feet thick.

(6) Brown, fine-grained massive sandstone, 100 to 200 feet thick.

No structural features other than a consistent 2° to 3° dip of the strata to the southeast was noted on the claims.

Uranium mineralization was observed only at one locality in the interbedded sandstone-siltstone unit (No. 3) of the Fall River

formation. This locality, known as the Canyon Lode deposit, is at the base of a small side canyon trending N. 70° E. from Cedar Canyon (fig. 2). The deposit occurs in a 2-foot section of manganiferous sandstone and thinly laminated carbonaceous siltstones about 10 feet above the top of the Lakota formation and approximately 80 feet below the channel sandstone. Eight and nine-tenths tons of ore averaging 0.18 percent U_3O_8 and 0.34 percent V_2O_5 have been mined from the deposit. At the time of the examination, the trench from which the ore was taken was completely filled with water and the ore body, which according to the applicant, continued beyond the face of the cut, could not be observed. Samples on the surface at the top of the cut showed minor carnotite-type mineralization and some dull black radioactive material. Highest scintillometer readings around the trench were 0.30 MR/hr above background. Twenty-seven holes have been drilled around the deposit by the applicant; however, on the map accompanying his report, only 14 are shown and the locations of these are in doubt. Figure 2 of this report shows the location of 24 of the drill holes as determined from a plane table survey made by E. V. Post, geologist for the U.S.G.S. in the area. Of the 27 holes drilled, 16 gave indications of a 650-ton ore body 2.2 feet thick and averaging 0.25 percent U_3O_8 (radiometric) in the same horizon as that of the mined body. Unfortunately, however, no chemical analyses were made, nor were the holes probed. All radiometric data was obtained solely by scanning the drill cuttings. During the course of E. V. Post's

investigation in the area, he had six "high grade" outcrop samples chemically analyzed and although one ran 0.80 percent U_3O_8, the remainder contained less than 0.05 percent U_3O_8.

Two other areas along the rim of the canyon in the sandstone-siltstone unit are said to be anomalously radioactive. One of these was examined by the writers and nothing to indicate mineralization was noted in the area. The applicant was in doubt as to the location of the other anomaly and it was not investigated.

There is no evidence to indicate that the channel sandstone (unit No. 2a) has in any way influenced the deposition of ore in the underlying sandstone-siltstone unit. The deposit is at least 80 feet below the contact with the channel sandstone and nowhere else, either on the claims or outside of them, where the channel is present, are there any strong indications of mineralization.

In summary then, it appears that although uranium mineralization is present in the Fall River formation in this area, the deposits are small and probably widely scattered. Certainly Glen Canyon itself, which ideally exposes almost the entire Inyan Kara group over a length of more than 1,600 feet, affords one of the better means of determining the uranium potential in the area. An examination of this exposure has revealed only one small area of uranium mineralization. Furthermore, recommendations for exploration based on the proximity of nearby deposits in

rocks of equivalent age do not appear to be valid. The Gould mine, 7 miles northwest, is the nearest Fall River deposit, and there the geologic environment is apparently very different.

McClure lease and Eleven claim group

These two groups of claims have been included in the applicant's proposed exploration program. The McClure lease group occupies the SW 1/4 sec. 29, and the NW 1/4 sec. 32, T. 8 S., R. 4 E., and the Eleven claim group is in sec. 34, T. 8 S., R. 4 E., Fall River County, South Dakota (fig. 1).

Nearly the full section of Inyan Kara lithology is exposed on these two holdings; however, the unit sequence has altered considerably from that of the Cedar Canyon claim group as described previously. Of considerable interest is the change in the Lakota formation which in these two areas consists of a thick section of interbedded thin mudstones and sandstones. This mudstone-sandstone unit represents a change in the depositional environment between the Craven Canyon sandstone member of the Lakota to the west and the Fall Canyon sandstone member to the east.

Structurally, the areas are very similar to the Cedar Canyon claim group.

Uranium mineralization has been localized at the base of the sandstone-mudstone unit of the Lakota in at least two known localities - the Accidental mine and McCloud property - outside

the Big Sioux holdings. These deposits are 1 and 1-1/2 miles, respectively, to the northwest of the McClure lease. No significant mineralization is exposed on either the McClure lease or Eleven claim group; however, each of the properties is reported to contain a surficial or Fall River radioactive anomaly. The locations of these anomalies were unknown to the applicant and consequently were not investigated by the examining team. The Atomic Energy Commission has drilled one hole on the McClure lease. This drill hole, which penetrated to the Jurassic Unkpapa formation, encountered no uranium mineralization nor were any radioactive anomalous zones detected.

Primary basis for the proposed exploration program is again the presence of a similar lithology in which uranium mineralization has been localized nearby. We feel strongly, however, that the size and nature of the deposits found to date do not justify further exploration.

ORE RESERVES

The only known ore reserve is in an area 50 by 100 feet on the Canyon claim. The ore body, about 2.2 feet thick, has been delineated by 16 drill holes and has been estimated by the applicant's geologist to contain 650 tons of inferred ore averaging 0.25 percent U_3O_8. No chemical analyses were made of the ore and apparently the sampling and radiometric assays were not conducted in too satisfactory a manner.

PROPOSED EXPLORATION AND COSTS

The applicant proposes a two-stage drilling project consisting of about 14,800 feet of non-core drilling and 600 feet of core drilling. The applicant's estimated costs follow:

Stage I

Independent contracts

Bulldozing, 5 days at $14/day	$ 1,680.00 (sic)	
3,200 feet of non-core drilling at $1.10/ft.	3,520.00	
4,200 feet of non-core drilling at $1.25/ft.	5,250.00	
200 feet of core drilling at $2.35/ft.	470.00	
100 feet of core drilling at $2.90/ft.	290.00	
Standby, casing, miscl. drilling	1,000.00	
Total individual contracts		$12,210.00

Labor and supervision

Sampling labor, 60 days at $12/day	$ 720.00	
Geological and consulting fees	1,000.00	
Total labor and supervision		$ 1,720.00

Operating material and supplies

None

Operating equipment

None

Rehabilitation and repairs

None

New buildings, improvements, installations

None

Miscellaneous

Analytical work, 100 samples at $3.50 each	$ 350.00		
Postage and handling samples	50.00		
Total miscellaneous		$ 400.00	
Total estimated cost for Stage I			$14,330.00
Estimated cost per foot of drilling			$ 1.86
Cost of Stage II (Lumped)			$14,330.00
Total cost of project			$28,660.00
Government participation, 75 percent			$21,495.00

RECOMMENDATIONS AND CONCLUSIONS

Government participation in the uranium exploration program proposed by the Big Sioux Uranium and Mineral Company, Inc., is not recommended because of the following reasons:

(1) There are no known structures within the proposed exploration areas that might serve to localize or concentrate uranium-bearing solutions.

(2) There appears to be no textural or lithologic discontinuities within the Inyan Kara rocks, other than the facies change in the Lakota formation, that may form a favorable host rock for significant ore deposition.

(3) There are no known large radioactive anomalies, carbonatized or bleached zones, or other features that may indicate a large subsurface deposit.

(4) Only one small uranium deposit is known to occur on the claims. Larger, but still relatively small deposits, occur to the northwest in a distinctly different geological environment.

(5) Canyons which form ideal "exploration trenches" through the entire Inyan Kara group fail to disclose any significant uranium mineralization.

9/17/56 gla

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

224 New Customhouse
Denver 2, Colorado

September 14, 1956

RECEIVED
SEP 17 1956

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Joint Report of Examination, Docket No. DMEA-4331 (Uranium)
Big Sioux Uranium and Mineral Company
(Canyon Group, et al.), Fall River County, South Dakota

Enclosed are the original and three copies of a joint engineering and geologic report of examination on subject property.

The examiners conclude that the proposed exploration will not result in the discovery of a significant amount of uranium ore, and they recommend that the application be denied. We concur in this recommendation.

DMEA Field Team, Region III

W. M. Trever

By W. M. Trever
Executive Officer

Encl.

Received by
DMEA OPERATING COMMITTEE
9-19-56
(date).

TRANSMITTED SEP 14 1956

RECEIVED SEP 17 1956 DEPARTMENT OF THE INTERIOR

IN REPLY REFER TO: DMEA

SEP 12 1956 REGION III DENVER, COLORADO

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

September 12, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shaw
E. N. Harshman

Subject: DMEA Docket 4331 (Uranium), Big Sioux Uranium and Mineral Company (Canyon group, et al.), Fall River County, South Dakota

Enclosed are the original and nine copies of a joint report of examination by Donald H. Richter, U. S. Geological Survey, and Carl Belser, U. S. Bureau of Mines, covering their examination of the subject property.

The applicant proposes to explore for uranium by drilling on three claim groups in Fall River County, South Dakota. His estimated cost of the program is $20,660.

The examiners conclude that the proposed exploration will not result in the discovery of significant deposits of uranium ore and they recommend that the application for exploration assistance, DMEA Docket 4331, be denied.

We concur with the conclusions and recommendations.

John F. Shaw
Superintendent of the Denver Experiment Station

E. N. Harshman
Member, Field Team

Reviewed by DMEA OPERATING COMMITTEE
9-19-56
(date)

Enclosures (10)
EHarshman:mp

TRANSMITTED SEP 1 4 1956

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SEP 1 7 1956

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

CONFIDENTIAL
NOT FOR PUBLIC INSPECTION OR QUOTATION

DMEA 4331

Big Sioux Uranium and Mineral Company, Inc.

Cedar Canyon and Eleven Claim Groups, and McClure Lease

Fall River County, South Dakota

Uranium

Joint Engineering and Geological Report

by

Donald H. Richter, Geologist
Geological Survey

Carl Belser, Mining Engineer
Bureau of Mines

September 11, 1956

9-19-56

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BIG SIOUX URANIUM AND MINERAL COMPANY, INC.
CEDAR CANYON AND ELEVEN CLAIM GROUPS, AND McCLURE LEASE
FALL RIVER COUNTY, SOUTH DAKOTA

INTRODUCTION AND SUMMARY

Big Sioux Uranium and Mineral Company, Inc., 1209 South Main Avenue, Sioux Falls, South Dakota, on June 8, 1956, made application to the Defense Minerals Exploration Administration for aid in a two-stage drilling project consisting of 15,400 feet of core and non-core drilling at an estimated cost of $28,660.

The properties were examined on August 14, 1956, by an examining team from the Bureau of Mines and the Geological Survey.

The properties consist of five unpatented mining claims in section 25, 11 unpatented mining claims in section 34 and 320 acres of fee land in the SW 1/4 section 29 and the NW 1/4 section 32; all in T. 8 S., R. 4 E., Black Hills meridian, Fall River County, South Dakota. The properties are from 11 to 16 miles southwest of Hot Springs, South Dakota. The altitude ranges from about 3,300 to 3,600 feet.

The consolidated rocks exposed on the properties are a series of Cretaceous sandstones, siltstones, and mudstones of the Fall River and Lakota formations (Inyan Kara group). Interfingering of the different rock types is common and the lithologic sequence

changes throughout the area. The attitude of the strata is relatively consistent. The strike is generally northeast and the dip ranges from 1° to 4° SE. Uranium mineralization occurs north and west of the properties, but significant amounts of ore have been produced from only two mines, the Gould and Accidental.

In the Cedar Canyon claim group 8.9 tons of ore averaging 0.18 percent U_3O_8 have been mined from a sandstone-siltstone unit in the Fall River formation. Drilling in the vicinity of the deposit has outlined a possible 650-ton ore body. Two other radioactive areas are said to occur on the claim group, but they apparently contain no significant uranium mineralization.

On the Eleven claim group and the McClure lease a few radioactive anomalies are reported but, as in the case of the Cedar Canyon claims, no uranium mineralization has been observed.

Government participation in the applicant's proposed exploration program is not recommended because, (1) there are no known structures or lithologic discontinuities that might serve to localize uranium deposition, (2) no large radioactive anomalies or altered zones indicative of subsurface deposits are present, (3) only one small uranium deposit has been found on the claims, and (4) canyons which form ideal "exploration trenches" through the Inyan Kara rocks fail to disclose significant uranium mineralization.

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SEP 17 1956

ACKNOWLEDGMENTS

The examining team was accompanied by Manas Veeraburus, I.C.A. geologist, Edwin C. Post, U.S.G.S. geologist, and Francis Michaud who represented the applicant.

Memorandums of N. E. Nelsen and John S. Crawford were noted.

Mr. Ray Barkeley, geologist for the Atomic Energy Commission in Hot Springs, South Dakota, was consulted at the time of the examination.

LOCATION, TOPOGRAPHY, AND CLIMATE

The property consists of 5 unpatented mining claims in section 25, 11 unpatented mining claims in section 34, and 160 acres of fee land in the SW 1/4 section 29, 160 acres of fee land in the NW 1/4 section 32; all in T. 8 S., R. 4 E., Black Hills meridian, Fall River County, South Dakota. (fig. 1)

The Cedar Canyon claim group can be reached by traveling southwest from Hot Springs over South Dakota Highway 87 a distance of 10.5 miles, thence 1 mile northwest over a poor access road. The McClure lease and Eleven claim groups can be reached by traveling northeast from Edgemont over U. S. Highway 18 a distance of 12 miles, thence southeast over a fair dirt road 3 and 6 miles, respectively.

Altitudes of the properties range from about 3,300 to 3,600 feet.

Labor and supplies can be obtained from Edgemont or Hot Springs, and an ore buying depot is maintained at Edgemont.

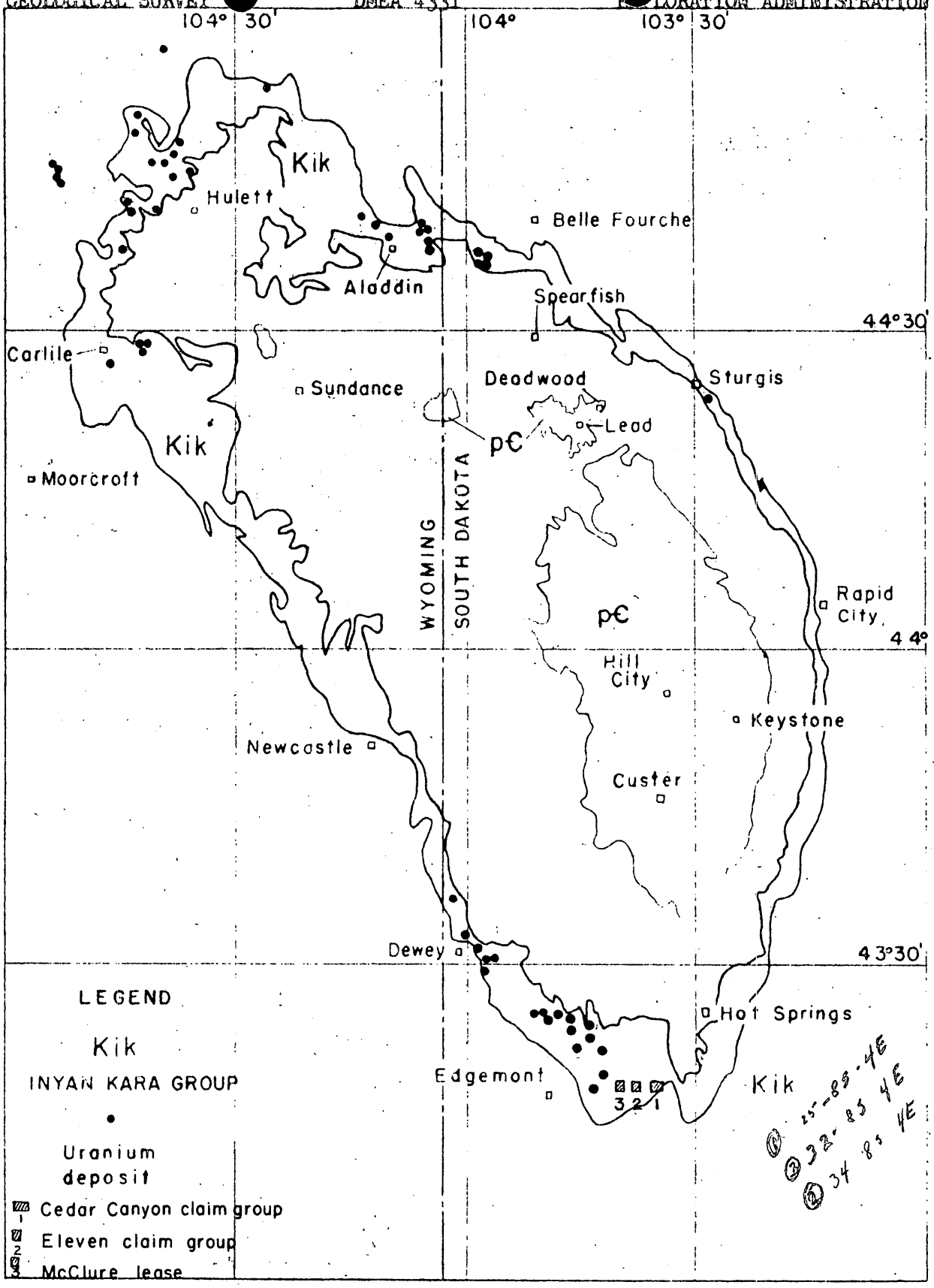

FIGURE I. INDEX MAP OF THE BLACK HILLS SHOWING THE HOLDINGS OF THE BIG SIOUX URANIUM AND MINERAL COMPANY, INC.

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SEP 17 1956

The Burlington railroad passes through Edgemont, and Hot Springs is on the Chicago and Northwestern railroad.

HISTORY AND PRODUCTION

The claims were located late in 1954. Access roads were built on the Cedar Canyon group by Melvin Hanson in 1955, and a small amount of ore was shipped. Discovery pits were bulldozed on the Eleven claim group.

Total production amounts to 8.9 tons averaging 0.18 percent U_3O_8 and 0.34 percent V_2O_5. This production was made from an exposed ore zone on the Canyon claim.

OWNERSHIP AND EXTENT

The SW 1/4 section 29 and the NW 1/4 of section 32, T. 8 S., R. 4 E., Black Hills meridian, are assessed to Abram E. McClure. A United States patent was issued on this land on March 1, 1921, and is recorded in Book 7, page 576, of the records of Fall River County, South Dakota. The mineral rights were leased on October 8, 1954, to Melvin and Jessie Hanson, and Francis and Mary M. Michaud. This lease was transferred to the Big Sioux Uranium and Mineral Company, Inc., on November 1, 1955. The lease transfer is recorded in Book 38, pages 438 and 439.

The following claims are recorded in the Office of the Register of Deeds, Fall River County, South Dakota:

Claim	Book	Page	Location Date	Locator
Cedar Canyon group				
Niggar	35	185	9/27/54	Everett and Marie Hill
Niggar Hill	35	185	"	Francis Michaud and Melvin Hanson
Hans	35	188	"	" " " " "
Canyon	35	189	"	" " " " "
Side Hill	35	189	"	Everett and Marie Hill
Eleven claim group				
Flat	35	232	11/18/54	Jessie Hanson
Hull	35	233	"	Mary M. Michaud
Sunday	35	233	11/17/54	Francis Michaud
Sunday No. 1	35	234	11/17/54	Melvin Hanson
Sunday No. 2	35	234	"	Francis Michaud
Hanson	35	235	"	Melvin Hanson
Hanson No. 1	35	235	"	" "
Number Five	35	235	"	Francis Michaud
Number Seven	35	236	"	" "
Jim	35	237	"	Melvin Hanson
Pete	35	237	"	Francis Michaud

The Niggar Hill, Hans, and Canyon claims were transferred by Everett and Marie Hill to Melvin and Jessie Hanson and Francis and Mary M. Michaud who, on November 1, 1955, transferred the claims to the Big Sioux Uranium and Mineral Company, Inc. The transfer carries a 13-1/2 percent royalty on production and is recorded in Book 38, pages 437 and 438.

The Flat, Sunday, Sunday No. 1, Sunday No. 2, Jim, Hull, Hanson, Hanson No. 1, Peter, Number Five, and Number Seven claims were transferred to the Big Sioux Uranium and Mineral Company, Inc., on November 1, 1955. The transfer calls for a two-percent production royalty and is recorded in Book 35, pages 439 and 440.

The Niggar and Side Hill claims were transferred on November 1, 1955, by Melvin and Jessie Hanson and Francis and Mary M. Michaud to the Big Sioux Uranium and Mineral Company, Inc. The transfer carried a two-percent royalty on production and is recorded in Book 38, pages 435 and 436.

PRESENT STATUS

Exploration and development

Exploration consists of a bulldozer cut on the Canyon claim and 27 drill holes in the vicinity of this cut. A survey for radioactivity has discovered weak anomalies on the McClure lease, the Cedar Canyon group, and the Eleven claim group.

Mining and milling equipment and other facilities

There is no mining or milling equipment on the property. Other facilities consist of a few access roads.

GEOLOGY AND URANIUM DEPOSITS

General statement

The consolidated rocks exposed on the holdings of the Big Sioux Uranium and Mineral Company, Inc., consist of a series of lower Cretaceous sedimentary rocks known as the Inyan Kara group. This group, which forms one of the outer peripheral hogbacks to the Black Hills, is now divided into two formations - the Fall River and the Lakota. The Fall River or uppermost member of the Inyan Kara consists of a series of sandstones, mudstones, and interbedded sandstones and siltstones. The Lakota formation, which now includes the old Fuson formation, is primarily a series of sandstones and mudstones. Interfingering of the different rock types within these formations is common, and the lithologic sequence changes frequently throughout the area. The Inyan Kara overlies the Jurassic Morrison formation in the southwest part of the Black Hills and the equivalent Unkpapa sandstone in the areas described here. Thin deposits of Quaternary terrace gravels and alluvium locally cover the Cretaceous rocks.

Structural deformation throughout the area is a result of the Laramidian Black Hills uplift and the attitude of the strata depends upon their position with respect to the elongate Black Hills dome. In the areas examined in the southern Black Hills, the

regional strike is NE, and the dip ranges from 1° to 4° SE. Although a number of north-trending anticlines and monoclines are superimposed on this regional homocline, none were observed in the areas investigated.

Occurrences of uranium mineralization are common in the Inyan Kara group to the north and west of the examined claims. However, only a very few of these occurrences have had material which warranted mining or exploration and only two - the Gould and Accidental mines - have shipped any significant amounts of ore. The Gould mine, from which over 10,000 tons of carnotite-type ore has been shipped from the Fall River formation, is by far the largest mine in the area, and is the only producer. In the Accidental, now abandoned, a 500-ton ore body was mined from the Lakota formation. Two other properties worthy of mention in the area are the McCloud, in the Lakota formation, and the Livingston, in the Fall River, both of which are now undergoing development.

Cedar Canyon claim group

The Cedar Canyon claim group consists of the Hans, Side Hill, Canyon, Niggar, and Niggar Hill lode mining claims in the SE 1/4 sec. 25, T. 8 S., R. 4 E., Fall River County, South Dakota (figs. 1 and 2).

The rocks of the Inyan Kara group are well exposed on the five claims of the Cedar Canyon claim group; only the lowermost unit

of the Lakota formation is absent. The rock units present, from the top of the Fall River formation downward, are as follows:

Fall River formation

(1) Brown, fine-grained massive sandstone, 25 to 30 feet thick.

(2) Gray, fissile mudstone, with minor siltstone, 15 to 30 feet thick. (Buff, fine-grained micaceous channel sandstone has filled the scours in unit 3. It is as much as 70 feet thick)

(3) Light- to dark-brown thinly interbedded sandstones and carbonaceous siltstones 20 to 110 feet thick. Upper part of this unit usually consists of a 10- to 20-foot thick section of brown sandstone.

Lakota formation

(4) Buff, medium-grained massive sandstone with a grit and conglomerate base, 30 to 50 feet thick.

(5) Brown mudstones, probably equivalent to the old Fuson formation, 10 to 30 feet thick.

(6) Brown, fine-grained massive sandstone, 100 to 200 feet thick.

No structural features other than a consistent 2° to 3° dip of the strata to the southeast was noted on the claims.

Uranium mineralization was observed only at one locality in the interbedded sandstone-siltstone unit (No. 3) of the Fall River

formation. This locality, known as the Canyon Lode deposit, is at the base of a small side canyon trending N. 70° E. from Cedar Canyon (fig. 2). The deposit occurs in a 2-foot section of manganiferous sandstone and thinly laminated carbonaceous siltstones about 10 feet above the top of the Lakota formation and approximately 80 feet below the channel sandstone. Eight and nine-tenths tons of ore averaging 0.18 percent U_3O_8 and 0.34 percent V_2O_5 have been mined from the deposit. At the time of the examination, the trench from which the ore was taken was completely filled with water and the ore body, which according to the applicant, continued beyond the face of the cut, could not be observed. Samples on the surface at the top of the cut showed minor carnotite-type mineralization and some dull black radioactive material. Highest scintillometer readings around the trench were 0.30 MR/hr above background. Twenty-seven holes have been drilled around the deposit by the applicant; however, on the map accompanying his report, only 14 are shown and the locations of these are in doubt. Figure 2 of this report shows the location of 24 of the drill holes as determined from a plane table survey made by E. V. Post, geologist for the U.S.G.S. in the area. Of the 27 holes drilled, 16 gave indications of a 650-ton ore body 2.2 feet thick and averaging 0.25 percent U_3O_8 (radiometric) in the same horizon as that of the mined body. Unfortunately, however, no chemical analyses were made, nor were the holes probed. All radiometric data was obtained solely by scanning the drill cuttings. During the course of E. V. Post's

investigation in the area, he had six "high grade" outcrop samples chemically analyzed and although one ran 0.30 percent U_3O_8, the remainder contained less than 0.05 percent U_3O_8.

Two other areas along the rim of the canyon in the sandstone-siltstone unit are said to be anomalously radioactive. One of these was examined by the writers and nothing to indicate mineralization was noted in the area. The applicant was in doubt as to the location of the other anomaly and it was not investigated.

There is no evidence to indicate that the channel sandstone (unit No. 2a) has in any way influenced the deposition of ore in the underlying sandstone-siltstone unit. The deposit is at least 80 feet below the contact with the channel sandstone and nowhere else, either on the claims or outside of them, where the channel is present, are there any strong indications of mineralization.

In summary then, it appears that although uranium mineralization is present in the Fall River formation in this area, the deposits are small and probably widely scattered. Certainly Glen Canyon itself, which ideally exposes almost the entire Inyan Kara group over a length of more than 1,600 feet, affords one of the better means of determining the uranium potential in the area. An examination of this exposure has revealed only one small area of uranium mineralization. Furthermore, recommendations for exploration based on the proximity of nearby deposits in

rocks of equivalent age do not appear to be valid. The Gould mine, 7 miles northwest, is the nearest Fall River deposit, and there the geologic environment is apparently very different.

McClure lease and Eleven claim group

These two groups of claims have been included in the applicant's proposed exploration program. The McClure lease group occupies the SW 1/4 sec. 29, and the NW 1/4 sec. 32, T. 8 S., R. 4 E., and the Eleven claim group is in sec. 34, T. 8 S., R. 4 E., Fall River County, South Dakota (fig. 1).

Nearly the full section of Inyan Kara lithology is exposed on these two holdings; however, the unit sequence has altered considerably from that of the Cedar Canyon claim group as described previously. Of considerable interest is the change in the Lakota formation which in these two areas consists of a thick section of interbedded thin mudstones and sandstones. This mudstone-sandstone unit represents a change in the depositional environment between the Craven Canyon sandstone member of the Lakota to the west and the Fall Canyon sandstone member to the east.

Structurally, the areas are very similar to the Cedar Canyon claim group.

Uranium mineralization has been localized at the base of the sandstone-mudstone unit of the Lakota in at least two known localities - the Accidental mine and McCloud property - outside

the Big Sioux holdings. These deposits are 1 and 1-1/2 miles, respectively, to the northwest of the McClure lease. No significant mineralization is exposed on either the McClure lease or Eleven claim group; however, each of the properties is reported to contain a surficial or Full River radioactive anomaly. The locations of these anomalies were unknown to the applicant and consequently were not investigated by the examining team. The Atomic Energy Commission has drilled one hole on the McClure lease. This drill hole, which penetrated to the Jurassic Unkpapa formation, encountered no uranium mineralization nor were any radioactive anomalous zones detected.

Primary basis for the proposed exploration program is again the presence of a similar lithology in which uranium mineralization has been localized nearby. We feel strongly, however, that the size and nature of the deposits found to date do not justify further exploration.

ORE RESERVES

The only known ore reserve is in an area 50 by 100 feet on the Canyon claim. The ore body, about 2.2 feet thick, has been delineated by 16 drill holes and has been estimated by the applicant's geologist to contain 650 tons of inferred ore averaging 0.25 percent U_3O_8. No chemical analyses were made of the ore and apparently the sampling and radiometric assays were not conducted in too satisfactory a manner.

PROPOSED EXPLORATION AND COSTS

The applicant proposes a two-stage drilling project consisting of about 14,600 feet of non-core drilling and 600 feet of core drilling. The applicant's estimated costs follow:

Stage I

Independent contracts

Bulldozing, 5 days at $14/day	$ 1,600.00 (sic)	
3,200 feet of non-core drilling at $1.10/ft.	3,520.00	
4,200 feet of non-core drilling at $1.25/ft.	5,250.00	
200 feet of core drilling at $2.35/ft.	470.00	
100 feet of core drilling at $2.90/ft.	290.00	
Standby, casing, miscl. drilling	1,000.00	
Total individual contracts		$12,210.00

Labor and supervision

Sampling labor, 60 days at $12/day	$ 720.00	
Geological and consulting fees	1,000.00	
Total labor and supervision		$ 1,720.00

Operating material and supplies

None

Operating equipment

None

Rehabilitation and repairs

None

New buildings, improvements, installations

None

Miscellaneous

Analytical work, 100 samples at $3.50 each	$ 350.00		
Postage and handling samples	50.00		
Total miscellaneous		$ 400.00	
Total estimated cost for Stage I			$14,330.00
Estimated cost per foot of drilling			$ 1.86
Cost of Stage II (Lumped)			$14,330.00
Total cost of project			$28,660.00
Government participation, 75 percent			$21,495.00

RECOMMENDATIONS AND CONCLUSIONS

Government participation in the uranium exploration program proposed by the Big Sioux Uranium and Mineral Company, Inc., is not recommended because of the following reasons:

(1) There are no known structures within the proposed exploration areas that might serve to localize or concentrate uranium-bearing solutions.

(2) There appears to be no textural or lithologic discontinuities within the Inyan Kara rocks, other than the facies change in the Lakota formation, that may form a favorable host rock for significant ore deposition.

(3) There are no known large radioactive anomalies, carbonatized or bleached zones, or other features that may indicate a large subsurface deposit.

(4) Only one small uranium deposit is known to occur on the claims. Larger, but still relatively small deposits, occur to the northwest in a distinctly different geological environment.

(5) Canyons which form ideal "exploration trenches" through the entire Inyan Kara group fail to disclose any significant uranium mineralization.

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

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OCT - 1 1956

224 New Customhouse
Denver 2, Colorado

September 26, 1956

Mr. Elgin E. Poole
Secretary-Treasurer
Big Sioux Uranium and Mineral Co.
1209 South Main Avenue
Sioux Falls, South Dakota

Re: Docket No. DMEA-4331 (Uranium)
Canyon Group, et al.
Fall River County, South Dakota

Dear Mr. Poole:

This will acknowledge receipt of your letter dated September 24, 1956. The report of examination on the captioned property has been forwarded the Washington Office, DMEA. They will advise you at an early date of their final action on this application for DMEA aid.

Yours very truly,

W. M. TRAVER

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

HMC:ytl

cc: Sec. Op. Comm. (2)
Harshman
Shaw (2)
Docket 4331
Chron.

7-18-56

RECEIVED
JUL 18 1956

REGION III

DMEA
Date Rec'd.
JUL 16 1956
BUREAU OF MINES
Denver, Colorado

Building 20
Denver Federal Center
Denver 2, Colorado
July 13, 1956

Memorandum

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

From: Superintendent, Denver Experiment Station, Reg. III

Subject: Docket DMEA 4331 (Uranium) Big Sioux Uranium and Mineral Company (Canyon Group, et al.) Fall River County, South Dakota

The application for Big Sioux Uranium and Mineral Company, DMEA 4331, in the amount of $28,660.00 was received in this office on July 13.

A field examination will be made and suitable report prepared by an engineer from the Denver Office.

JOHN F. SHAW

John F. Shaw

cc: W. M. Traver (2)
E. N. Harshman
J. F. Shaw
Sec. Op. Com (2)

DMEA
Date Rec'd.

JUL 16 1956

BUREAU OF MINES
Denver, Colorado

RECEIVED
JUL 16 1956

REGION III

Building 20
Denver Federal Center
Denver 2, Colorado
July 13, 1956

Memorandum

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

From: Superintendent, Denver Experiment Station, Reg. III

Subject: Docket DMEA 4331 (Uranium) Big Sioux Uranium and Mineral Company (Canyon Group, et al.) Fall River County, South Dakota

The application for Big Sioux Uranium and Mineral Company, DMEA 4331, in the amount of $28,660.00 was received in this office on July 13.

A field examination will be made and suitable report prepared by an engineer from the Denver Office.

JOHN F. SHAW

John F. Shaw

cc: W. M. Traver (2)
E. H. Harshman
J. F. Shaw
Sec. Op. Com (2)

7-16-56

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

RECEIVED
JUL 16 1956

July 12, 1956

[illegible] New Customhouse
Denver 2, Colorado

Memorandum

To: J. F. Shaw (2) (With brochure)
E. N. Hawkinson

From: Field Team, Region III

Subject: Docket DMEA 4331 (Uranium) Big Sioux Uranium and Mineral Company (Canyon Group, et al.), Fall River County, South Dakota

Enclosed is the subject application in the amount of $[illegible],660.00. A field examination and suitable report are requested.

Please note in the letter from the Chairman of the Operating Committee dated July 9, 1956, copy of which is attached, that many Owner's Consent to Lien and Subordination Agreements will be required in the event that you recommend an exploration program. We will, therefore, appreciate advice from you at an early date in the event that you recommend a contract so that we may obtain the required Owner's Consent to Lien, Subordination Agreements, and Lease Agreements without causing undue delay to the Applicant.

Also enclosed are copies of a review of the application by E. N. Halgren and John E. Crawford.

Please return the brochure with the Report of Examination.

DMEA Field Team, Region III

W. M. TRAVER,

By W. M. Traver
Executive Officer

Enclosures

EEC:ab

cc: Chair. Op. Comm. (2)
Docket 4331
Chron.

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

RECEIVED
JUL 16 1956

July 12, 1956

224 New Customhouse
Denver 2, Colorado

Memorandum

To: J. F. Shaw (2) (With brochure)
E. H. Merriman

From: Field Team, Region III

Subject: Docket DMEA 4331 (Uranium) Big Sioux Uranium and Minerval Company (Canyon Group, et al.), Fall River County, South Dakota

Enclosed is the subject application in the amount of $23,660.00. A field examination and suitable report are requested.

Please note in the letter from the Chairman of the Operating Committee dated July 9, 1956, copy of which is attached, that many Owner's Consent to Lien and Subordination Agreements will be required in the event that you recommend an exploration program. We will, therefore, appreciate advice from you at an early date in the event that you recommend a contract so that we may obtain the required Owner's Consent to Lien, Subordination Agreements, and Lease Agreements without causing undue delay to the Applicant.

Also enclosed are copies of a review of the application by N. E. Nelson and John E. Crawford.

Please return the brochure with the Report of Examination.

DMEA Field Team, Region III

W. M. TRAVER,

By W. M. Traver
Executive Officer

Enclosures

DMC:ab

cc: Chair. Op. Comm. (2)
Docket 4331
Chron.

700

FILE COPY
Surname:

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

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

JUN 1956

Re: Docket No. DMEA-4331 (Uranium)
Big Sioux Uranium and Mineral Company
Canyon Group, et al.
Fall River County, South Dakota

Dear Mr. Traver:

The captioned application is referred to Region III Field Team for investigation, a field examination if deemed advisable, and recommendation.

Enclosed are copies of memoranda, dated June 15 and 20, 1956, by N. E. Nelson, USGS, and J. K. Crawford, USBM, respectively, relating to the application.

In the event the Field Team recommends a project, it should advise the Applicant that we will require six copies each of the following:

1. On Nigger Hill, Hans, Canyon, Nigger, and Side Hill lode mining claims, a Subordination Agreement signed by Melvin and his wife, Jessie Hansen, and Francis and his wife, Mary M. Michaud; also, an Owners' Consent to Lien, signed by Everett and his wife, Marie Hill. Note: Copies of the lease agreement signed by the Hills were not submitted with the application;

2. On Flat, Sunday No. 1, Jim, Hall, Hanson, Hanson No. 1, Number Five, Pete, Number Seven, Sunday, and Sunday No. 2 lode mining claims, a Subordination Agreement signed by Melvin and his wife, Jessie Hansen, and Francis and his wife, Mary M. Michaud; and

3. On the SW¼ of sec. 29 and the NW¼ of sec. 32, T. 8 S., R. 4 E., Black Hills B & M, Fall River County, South Dakota, a Subordination Agreement signed by the same people as in Item 2 above, and also an Owner's Consent to Lien signed by Abram E. McClure. Note: Copies of the McClure lease on the two quarter sections were not submitted with the application. Copies of this lease and the Hill lease, Item 1 above, should be requested.

The Applicant should also be advised that the addresses of the signers should be indicated on all copies of the subordination agreements and the consents to lien submitted.

Sincerely yours,
George G. Selfridge
Chairman, Operating Committee (JHB)

Enclosures
APPROVED: /s/ Robert W. Geehan (JHB)
Member, Bureau of Mines

Thor H. Kiilsgaard (JHB)
Member, Geological Survey

Operating Committee
Messrs. JECrawford, Rm. 3643
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA

FWMurphy/izm 7-3-56
cc to: Docket
Code 700
Mr. Murphy
Admr.'s Reading File

700

FILE COPY

Surname:
Murphy
Silva
Serhan
Kilpatrick
Selfridge

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

JUL 9 - 1956

Big Sioux Uranium and Mineral Company
1209 South Main Avenue
Sioux Falls, South Dakota

Re: Docket No. DMEA-4331 (Uranium)
Canyon Group, et al.
Fall River County, South Dakota

Gentlemen:

The application for assistance in exploring your property, under the captioned docket number, has been reviewed by the Rare and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. It has been referred to:

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

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

Sincerely yours,

C. O. Mittendorf

Administrator

FMMurphy/izm 7-3-56
cc to: Docket
Code 700
Mr. Murphy
Admr.'s Readin File
DMEA Field Team, Reg. III (2)

6/28/56

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

RECEIVED
JUN 29 1956

June 28, 1956

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee

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

Subject: Application for Assistance, DMEA Docket 4331 (Uranium)
Big Sioux Uranium - Mineral Co., 1209 South Main Avenue,
Sioux Falls, South Dakota

I have reviewed the attached application, DMEA Docket 4331, Big Sioux Uranium-Mineral Co., 1209 South Main Avenue, Sioux Falls, South Dakota, dated June 8 and received in this office June 14, 1956. I have also discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

The application is for the amount of $28,660, with Government assistance at 75 percent for 7,700 feet of plug and core drilling and associated works.

After having evaluated the merits of the application, it is our suggestion that it be forwarded to the Field Team for consideration and that they consult with Ernest E. Thurlow, Manager, Denver Area Office, Atomic Energy Commission, Denver, Colorado.

John E. Crawford
John E. Crawford

Attachment

6/19/56
G.S.

IN REPLY REFER TO:

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

RECEIVED
JUN 18 1956

June 15, 1956

Re: DMEA 4331
Big Sioux Uranium and
Mineral Co. Inc.
Canyon and McClure Lease-
Eleven Claims Groups
Fall River Co., S. Dak.
$28,660.00 - Uranium

Memorandum

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

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

Subject: Review of application.

The applicant requests assistance in prospecting and exploring by drilling 3 properties believed to be underlain by the rocks of the Inyan Kara group, which in areas nearby are the host rocks of producing ore deposits. Nearly the full section of Inyan Kara lithology is exposed on the McClure Lease-Eleven Claim group, but on the Canyon Group the Fuson and Lakota formations are not exposed.

No ore exposures are known on the McClure-Eleven Claim group and the application rests on similarity of the lithology to that of nearby properties. The proposed drilling would be prospective in nature, the target being mineralization in the Lakota sandstone.

From a small orebody in the Fall River formation on the Canyon Lode claim, 8.9 tons of a 0.18% U_3O_8 and 0.34% V_2O_5 material has been shipped. Twenty-seven holes have been drilled near the showing. Sixteen holes indicate ore and an inferred reserve amounting to 650 tons is estimated for the orebody. Two other anomalous areas are known but have not been closely investigated.

Targets for drilling on the Canyon Group consist of other such deposits in the Fall River beds and in the Lakota sandstone of which there are no outcrops on the Canyon group.

Appraisal of the application rests in large part on the demonstrated frequency of the characteristic small ore bodies on nearby properties. I do not have an inventory of such orebodies.

Referral of the application to the Field Team for appropriate action is recommended.

N. E. Nelson

N. E. Nelson

IN REPLY REFER TO:

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

June 15, 1956

RECEIVED
JUN 18 1956

Re: DMEA 4331
Big Sioux Uranium and
Mineral Co. Inc.
Canyon and McClure Lease-
Eleven Claim Groups
Fall River Co., S. Dak.
$28,660.00 - Uranium

Memorandum

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

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

Subject: Review of application.

The applicant requests assistance in prospecting and exploring by drilling 3 properties believed to be underlain by the rocks of the Inyan Kara group, which in areas nearby are the host rocks of producing ore deposits. Nearly the full section of Inyan Kara lithology is exposed on the McClure Lease-Eleven Claim group, but on the Canyon Group the Fuson and Lakota formations are not exposed.

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N. E. Nelson

N. E. Nelson

cc: Director's reading file (4212)
Branch reading file
DMEA(3)
Chron. file. Docket File

cc: J.E.Crawford,
J. O. Hosted

NENelson:btr G 6/15/56

June 13, 1956

Big Sioux Uranium Co.
1209 South Main Avenue
Sioux Falls, South Dakota

Subject: DMEA-4331
Re: Exploration Assistance
Hans, Side Hill, Canyon,
Niggar, et al., Claims

Gentlemen

The receipt of your application dated June 8, 1956 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-4331 and referred to the Rare & Misc. Metals Division.

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

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

June 13, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region III.

DMEA
-4331 Big Sioux Uranium Co.

Robert E. Adams
Chief, Operation's Control
and Statistics Division

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

RECEIVED
JUN 13 1956

June 11, 1956

224 New Customhouse
Denver 2, Colorado

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Application for DMEA Aid (Uranium) Big Sioux Uranium and Mineral Company (Hans, Side Hill, Canyon, Niggar, et al. mining claims), Fall River County, South Dakota

Enclosed are three copies of the subject application in the amount of $28,660.00.

One copy of a Prospectus of the Applicant Company and one Flint Hill Quadrangle map were furnished by the Applicant and are attached herewith.

One copy of the application is being retained in our file.

DMEA Field Team, Region III

By W. M. Traver
Executive Officer

Enclosures

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

RECEIVED
JUN 13 1956

June 11, 1956

224 New Customhouse
Denver 2, Colorado

Memorandum

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From: Field Team, Region III

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One copy of the application is being retained in our file.

DMEA Field Team, Region III

W. M. TRAVER,

By W. M. Traver
Executive Officer

Enclosures

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

RECEIVED
JUN 13 1956

DMEA
Date Rec'd. JUN 11 1956
BUREAU OF MINES
Denver, Colorado

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

Not to be filled in by applicant

Docket No. DMEA-4331
Metal or Mineral URANIUM
Date Received 6/13/56
Estimated Cost $28,660.00
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: Big Sioux Uranium Mineral Co. 1209 South Main ave. Sioux Falls So. Dak.
See enclosed Prospectus

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(*c*) The work will start within 30 days and be completed within 6 months from the date of an exploration project contract.

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

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

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

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

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

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

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

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

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

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

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

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

(*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 June 8, 1956

Big Sioux Uranium Mining Co
(Applicant)

By Francis Michaud V.P.
Director

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

Hot Springs, S. D.
April 5, 1956

RECEIVED
JUN 13 1956

Big Sioux Uranium & Mineral Co.
c/o Francis Michaud
Hot Springs, S. D.

ATTENTION: Mr. Francis Michaud

Dear Sir:

We submit our bid for drilling for Big Sioux Uranium & Mineral Co. located in Fall River County, South Dakota, as follows:

Plug Drilling
0 - 100 ft. @ $1.00
100 - 200 ft. @ 1.15
200 - 300 ft. @ 1.35
300 - 400 ft. @ 1.55

Core Drilling
0 - 100 ft. @ $2.00
100 - 200 ft. @ 2.25
200 - 300 ft. @ 2.55
300 - 400 ft. @ 2.90

Bottom Hole Core (20 ft. of core)
0 - 100 ft. @ $1.50
100 - 200 ft. @ 1.75
200 - 300 ft. @ 2.05
300 - 400 ft. @ 2.40

Standby time $12.00 per hour

Any casing, cementing, blind holes, work over, etc. will be done at standby rates of $12.00 per hour with Big Sioux furnishing the materials.

Big Sioux will furnish roads, drill sites, bulldozers, etc., necessary to expedite the drilling.

McGuire Drilling Co. will furnish rigs, men, bits, drilling mud and all necessary equipment to drill with. Drilling with air will be used as much as possible.

McGuire Drilling Company

O M McGuire Jr

By: O. M. McGuire, Jr.

COST ESTIMATE

OF

BIG SIOUX DRILLING PROJECT

RECEIVED

JUN 1 8 1986

First Phase

Canyon Group - 3200 ft at 1.10 /ft. $3520.00
200 ft (core) at 2.35 /ft..... 470.00

McClure Lease & Eleven Claim Group - 4200 ft at 1.25 /ft.....5250.00
100 ft (core) at 2.90 /ft..290.00

Geological Consulting Fees and Expenses 1000.00

Misc. (Drilling Stand by Time, Cost of Casing if needed) & Misc. supplies 1000.00

Sampling - Labor $12.00 / day - 60 days.....7200.00 ? FMM
$12250.00

UNIT COST / FOOT - $12250/7700ft. = $1.59

Estimated amount of dozer work needed - 5 days at $14.00 /day .....$1680.00 ? FMM

Sample analyses - 100 at $3.50 each 350.00
Cost of handling and postage..... 50.00
$2080.00

Total cost for first phase of drilling.....$14330.00

Estimated cost for second phase of drilling.....$14330.00

Total cost of project including both first and second phases of drilling.....$28660.00

(Cost to government at 75%) $21495.00

A GEOLOGIC REPORT ON CERTAIN HOLDINGS OF THE BIG SIOUX URANIUM AND MINERAL CO. INC.

In order to supplement a previous report on properties held by the Big Sioux Uranium and Mineral Co., a brief geologic investigation was made of the following additional properties.

1. A total of 320 acres described as the Abram E. McClure lease consisting of the southwest quarter (SW$_4$) of section twenty-nine (29) and the northwest quarter (NW$_4$) of section thirty-two (32), in township 8 South, Range 4 East of the Black Hills Meridian.
2. Eleven lode mining claims - the Flat Lode, Sunday Lode No. 1, Jim Lode, Hull Lode, Hanson No. 1, Hanson Lode, Number Five Lode, Peter Lode, Number Seven, Sunday Lode and the Sunday Number Two Lode all in section thirty-four (34), township 8 South, Range 4 East of the Black Hills Meridian.

Nearly the full section of Inyan Kara lithology is exposed on both the McClure lease and the Eleven Claim group, however the unit sequence has altered considerably from that of the Canyon group of claims as described in the previous report.

The Fall River consists primarily of brown, medium bedded to massive fine-grained quartz sandstones with frequent lenses of dark gray to black siltstones. Total thickness of the Fall River

averages 150 feet with the siltstones generally occurring in the central section.

The variegated claystones and siltstones of the Fuson formation appear to be about 60-70 feet thick on both of these properties.

The 200 feet thick massive Lakota sandstone of the Canyon Group has split up into an irregular series of sandstone units and thin bedded sandstone-siltstone units in the vicinity of both the claim group and the McClure lease.

The area immediately west of the McClure lease is known locally as the Lower Chilson Canyon Area and is the site of several producing mines and numerous visible occurrences of uranium mineralization. All of the known uranium deposits here are concentrated in the basal section of the Lakota formation. The ore minerals in these deposits have all been of the secondary "carnotite type" with a vanadium content approximately equivalent to that of the U_3O_8. The Atomic Energy Commission has done a considerable amount of core drilling on the Lorenz Property which is adjacent to the McClure lease on the west. From talks with the owners it appears that the drilling indicated a definite relationship between the ore location and the nature of the Lakota contact with the underlying Morrison formation. The contact is unconformable with a series of basins and swells marking the Morrison surface. Uranium mineralization was generally confined to the flanks or areas between the "highs" and "lows" in the Morrison surface. Evidently drilling did not progress to a point outlining any directional trends.

One surficial radioactivity anomaly has been located on each of the two properties. Both are assumed to be in a sandstone of the upper Fall River formation, however surface soil cover prevents inves-

tigation of the source. In the experience of the writer the greater number of this type of surface anomaly in the area are the result of residual material in the soil itself and rarely lead to a commercial uranium deposit.

The greatest potential of these two properties with respect to economic uranium deposits probably lie in the Basal Lakota formation. The wide area of known uranium occurrences in the vicinity indicate extensive mineralization and increase the probability of ore location through drilling.

It is suggested that five or six drill holes be put down on each of the two properties, widely spaced so as to gain maximum information from each. All of the holes should be drilled to the Morrison contact and would probably average greater than 400 feet in depth. Structure contouring of this contact would outline any major depressions or basins in the Morrison surface and indicate the position of future drilling.

Essentially both properties appear to be located in a favorable area by virtue of proximity to a known mineralized area with the same lithologic horizons present.

Respectfully submitted

Ralph B. Hall
Consulting Geologist

RECEIVED
JUN 13 1956

Preliminary Report on the Geology of the Hans, Side Hill, Canyon, Niggar and Niggar Hill Mining Claims, Fall River County, South Dakota

by

Ralph B. Hall

March 1956

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JUN 13 1956

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2	Purpose
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5	Local Geology
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15	Recommendations

Illustrations

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7	Generalized Geologic column
18	Proposed Drill Hole Locations

PURPOSE

This investigation was initiated for the purpose of determining the potential of the below mentioned properties with respect to economic uranium deposits. A discussion of the local geology is presented with emphasis upon stratigraphy and its similarity to near-by producing deposits. A tentative plan for future exploration is formulated, based upon known geologic criteria.

LOCATION

The five mining claims described below are all located in the SE¼ of section 25, Township 8 South, Range 4 East, Fall River County, South Dakota. All are recorded in the Miscellaneous Records Office of the Register of Deeds, Hot Springs, South Dakota as follows;

Niggar Hill Lode (1)	Book	35	Page	185
Niggar Lode (2)	"	35	"	185
Hans Lode (1)	"	35	"	188
Canyon Lode (1)	"	35	"	189
Side Hill Lode (2)	"	35	"	189

The nearest town is Hot Springs, South Dakota, which lies approximately 11.5 miles to the northeast. The property is reached by travelling approximately one mile on a trail that leads west from a point 10.5 miles south of Hot Springs on South Dakota Highway #87. This trail suffices in good weather but is apt to be impassible in wet weather and during the spring thawing season.

OWNERSHIP

The mineral rights on this group of five claims are owned by the Big Sioux Uranium and Mineral Company Incorporated of Sioux Falls, South Dakota. The claims are subject to overriding royalties of thirteen and one half per cent ($13\frac{1}{2}$ %) divided between the original land owner and the original claim locators.

GEOGRAPHY

Surface features of the canyon group of claims roughly divide the area into two distinct units. The eastern half comprising all of the Niggar Hill Lode and Niggar Lode claims plus a part of the Canyon Lode Claim, forms a gentle south-easterly dipping surface controlled by the dip of the underlying resistant sandstone. This surface is a part of the inter-canyon divide between Mike Canyon to the north-east and Cedar Canyon to the west. The Hans Lode, Side Hill Lode and the remaining part of the Canyon Lode cover the steep slopes and base of Cedar Canyon.

Topographic relief varies with a maximum of approximately 250 feet. A Maximum elevation of 3540 feet is attained in the north-eastern section of the group and a minimum elevation of 3290 in the bottom of Cedar Canyon on the South.

Vegetation is sparse with Ponderesa pine confined to the head and slopes of the draws. Most of the flat surface is grass-covered with occasional patches of sagebrush.

Drainage over the property is into Cedar Canyon and thence south to the Cheyenne River.

REGIONAL GEOLOGY

The Canyon group is located within the resistant sediments that form the outermost hogback surrounding the Black Hills. In descending order this hogback is composed of the Fall River, Fuson and Lakota formations which together are classed as the Inyan Kara group. This group forms the basal unit of the Cretaceous sediments and is underlain by the Jurassic Morrison formation, except on the southeastern flank of the Black Hills where the Unkpapa Sandstone replaces the Morrison formation. The Cretaceous black shales of the Skull Creek member of the Benton group lie conformably over the Fall River.

Structural deformation throughout the area is a result of the Laramidian Black Hills uplift. The regional dip varies with respect to position on the plunging southern nose of the elongate Black Hills dome. This southern end of the uplift is characterized by several major N-S trending anticlines and synclines giving rise to a fluted appearance.

Uranium production from the Inyan Kara group has been divided fairly equally between the Fall River and Lakota formations with only minor production from the Fuson. This group of sediments is composed generally of alternating sandstones, siltstones and claystones with a total thickness ranging between 350 and 550 feet.

LOCAL GEOLOGY

LITHOLOGY

Outcrop exposures in the vicinity of the Canyon Lode deposit allow a fairly accurate description of Fall River

lithology. The Fuson and Lakota formations are not exposed and therefore the following lithologic descriptions are based upon exposures in the surrounding areas. The Inyan Kara section has been divided into units that should be more or less consistent throughout the property. The units are described in descending order beginning with the uppermost member of the Fall River formation.

UNIT NO. 1
25-30 ft.

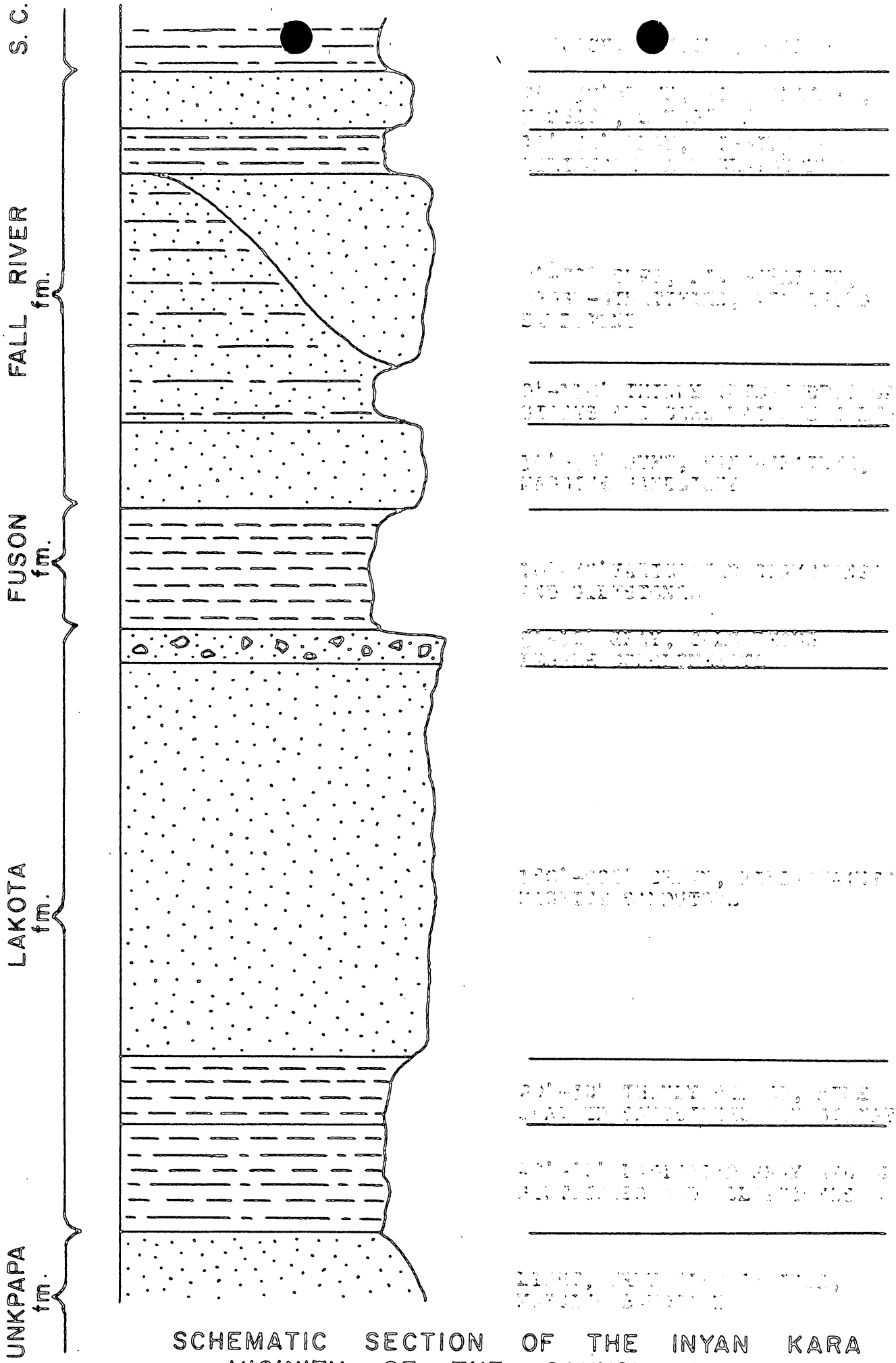
Buff to brown, fine to medium grained, massive, locally cross-stratified, quartz sandstone with minor amounts of altered feldspar grains. Average sorting and permeability throughout. This unit is quite resistant and is a cliff-former in the vicinity of the deposit. It forms the base for the flat inter-canyon surface between Mike and Cedar Canyons.

UNIT NO. 2
15-30 ft.

Gray to greenish gray, fissile siltstones and silty claystones with occasional thin, fine to very-fine grained quartz sandstone partings. This unit thickens to the northwest being approximately 20 ft. thick in the vicinity of the deposit.

UNIT NO. 3
0-70 ft.

Buff to light reddish brown, fine to medium grained, cross-stratified, micaceous, quartz sandstone. This unit is exposed



SCHEMATIC SECTION OF THE INYAN KARA
VICINITY OF THE CANYON GROUP

just above the deposit and extends through the westward trending nose just north of the deposit. It is again exposed just above the irrigation ditch in the western part of section 31, T 8 S, R 5 E. It is not evident in the rim of Cedar Canyon between these two exposures and is believed to be a paleo-stream channel truncating a portion of Unit No. 4. This channel sand is trending approximately N. 35° W.

UNIT NO. 4
0-110 ft.

Thinly enterbedded sandstones and siltstones. The sandstones are generally buff to brown, fine grained, thin to medium bedded consisting primarily of subround to subangular quartz grains and range in thickness from several inches to a maximum of 10 feet. The siltstones are generally black, finely laminated and fissile with abundant carbonaceous material. Occasional thin gray claystone partings are present within the siltstones. The Canyon Lode deposit is within 20 feet of the base of this unit. This unit pinches out about 2000 feet north of the deposit, the above and below

sandstones coalescing to form a thick sandstone member.

UNIT NO.5
30-50 ft.

Buff to brown, fine to medium grained, locally cross-stratified, quartz sandstone. On the rim, just below the deposit, this sandstone is quite resistant and a good cliff former. The base of this sandstone marks what is considered to be the Fuson-Fall River contact.

UNIT NO.6
10-80 ft.

Vari-colored, varigated claystones and siltstones. This unit represents the total Fuson section and in the vicinity of the mine is about 50 feet thick. This unit is very incompetent and is generally covered by debris where it should be exposed.

UNIT NO.7
2-5 ft.

Gray to dark gray, calcareous pebble conglomerate. This unit may be equivalent to the Minnewasta limestone which is present locally and considered a part of the Inyan Kara group.

UNIT NO.8
180-200 ft.

Yellow brown to red brown, very fine to medium grained, massive quartz sandstone with occasional thin siltstone and clay-

stone lenses. This sandstone is well exposed to the west and northwest and is quite consistant both in thickness and character throughout this area. The upper 5 feet of this unit is characteristically a red, fine-grained, calcareous quartz sandstone and has been used as a marker for the top of the Lakota Formation.

UNIT NO.9
20-30 ft.

Thinly interbedded, fine grained quartz sandstones and greenish gray siltstones. The sandstones are frequently calcareous.

UNIT NO.10
40-60 ft.

Thinly interbedded to laminated, gray to black siltstones and claystones lying directly upon the Unkpapa Sandstone. The Unkpapa Sandstone has here replaced the Morrison formation and is quite characteristically a very fine-grained, uniformly textured, massive, quartz sandstone usually exhibiting a bleached white color but often with pastel shades of yellow, red or purple.

The lithologic horizon described as unit No. 4 has been the only unit giving evidence of uranium mineralization in this area. It is a lenticular, interfingering type facies that should be present underlying all of the property except where cut through and eliminated through erosion.

The eastern end of the property will have a much thinner section of this unit due to the existence of the channel sandstone described as Unit No. 3. Exactly how much of Unit No. 4 is truncated by the channel is not known and will only be determined through drilling.

The thick massive sandstones of the Lakota formations have proven to be extensive uranium producers in the Edgemont district but are not exposed here to give any indication of uranium mineralization.

STRUCTURE

The average strike of the sediments on the Canyon group of claims is N 45°E with a dip between 2½ and 3 degrees to the southeast. The deposit lies on the gently rising western limb of the Coffee Flat syncline at a point approximately 7000 feet due west of its trough. The Coffee Flat syncline forms the declivity between the Cascade Anticline on the East and the Chilson Anticline on the west. Both anticlines are asymmetrical with steeply dipping western limbs and more gently dipping eastern limbs.

A local flexure just west of the deposit has reversed the strike of the sediments to about N55°W with a dip approaching 5° to the NE. Eastward through the deposit the strike swings back to the NE and the dip levels back to about NE 2½°. This slight variation in structure may have been important in the localization of uranium mineralization. In the highly productive Edgemont minning district which lies to the west, there seems to exist a definite relationship between ore deposits and local flattenings of dip.

CANYON LODE DEPOSIT (BIG SIOUX MINE)

The Canyon Lode deposit is located roughly in the center of the Canyon Lode Claim. The exposed ore zone is at the base of a small side canyon trending N65°E from Cedar Canyon. Production to date consists of one shipment of 8.9 tons averaging 0.18%U_3O_8 and 0.34%U_2O_5. This shipment was made to the AS&R ore buying station at Edgemont, South Dakota on January 6, 1956.

The host rock is the thinly bedded, interfingering, lenticular member of the Fall River formation described before as Unit No. 4. About 2 vertical feet of ore grade material is exposed at the base of a bulldozed cut that has scoured out the bottom of the narrow canyon. The exposed ore can be traced for about 15 feet along the northern side of the cut and for about a 10 foot width south from this. The basal 1½ feet of the exposed ore zone consists of a dark brown, fine grained, massive, quartz sandstone. Abundant small pod-like concentratious of black manganese oxide coating the individual quartz grains gives a mottled appearance to this sandstone lens. The 4 feet above consists of very finely laminated light gray, very fine grained sandstones and black, carbonaceous siltstones. Above this are thinly bedded fine grained sandstones with frequent carbonaceous siltstone partings. These overlying sandstones also have high concentrations of manganese oxide plus occasional sulphide concretions that reach a maxiumum of approximately 2 inches in diameter.

The ore grade uranium mineralization is concentrated in the basal manganiferous sandstone and in the lower 1 foot

of the finely laminated material. The sandstone appears to have carnotite type mineralization as interstitial material but concentration does not seem heavy enough to account for the high assays obtained on selected samples (up to 1.85%U_3O_8). It is probable that one of the dark colored, less easily identified uranium minerals is also present finely disseminated throughout the sandstone. The high vanadium content points to the possibility of one of the dark colored vanadium ores like Corvusite or Rauvite which are quite common in the Edgemont district.

The lower 1 foot of the laminated material contains concentrations of secondary Carnotite type material as coatings along bedding planes. The 8.9 ton shipment was taken from the base of this pit and it is believed that the ore existing in the face should maintain the 0.18%U_3O_8 assay.

Twenty-seven holes have been drilled in an area surrounding the ore exposure. (See map). Of these 27 holes, 16 gave indications of ore grade material in the same horizon. An average thickness of 2.2 feet was sampled and assayed radiometrically with an average grade of 0.25%U_3O_8. The ore body as drilled to date covers an area roughly 50 feet x 100 feet and averages 2.2 feet in thickness. Using a factor of 15 cu. ft. of sandstone per ton, an inferred reserve of 650 tons is estimated. This must be inferred because of the absence of chemical assays on the drill hole cuttings. However it has been noted in this district that the ores are generally fairly

close to being in equilibrium with only slight variations in either direction. Discussions with both A E C and USGS personnel indicated that samples taken from the exposure on this property were close to or in equilibrium between chemical and radiometric values.

In addition to the known deposit there exist several anomalous areas along the rim to the south. The first is about 300 feet from the deposit and the other is 150 feet from that. Both are located in the same stratigraphic horizon and have not been thoroughly investigated as yet.

CONCLUSIONS

The Canyon group of five claims contains the full section of Inyan Kara sediments including all of the known uranium producing horizons. The most important of these, the thinly bedded Fall River member described as Unit No.4 lies at shallow depths over the greater part of the property. The presence of a producing deposit plus several known anomalies indicates the high potential of this horizon. This potential is increased considerably with any local flattening of dip. Very close structural control should be exercised in future drilling. In the Edgemont district to the west it appears that the areas of greatest favorability are on the flat portions of structures such as monoclinal terraces and anticlinal noses.

The presence of the paleo-stream channel described as lithologic Unit No.3 is an interesting feature and could possibly have a bearing upon uranium precipitation.

From outcrop evidence this channel attains a maximum thickness of approximately 70 feet and truncates the greater portion if not all of the ore bearing unit. Assuming that the final concentration of the uranium minerals was accomplished through the varied activity of circulating ground water, the truncation of any sandstone lens in Unit No. 4 would provide an ideal loci for concentration. The controlling factor would be of coarse an abrupt blocking or diversion of normal down-dip flow. This would infer a physical difference between the two sandstones, the channel sandstone being less permeable or perhaps more highly cemented. This idea could only be investigated through close examination of drill hole data.

The possibility of channel type ore deposits similar to those of the Colorado Plateau region certainly exists. Although the Edgemont District is not noted for this type of deposit there is no reason to eliminate the possibility. Actually very little work has been done in the area to investigate known channels. The similarity between the Salt Wash Member of the Morrison Formation in the ColoradoPlateau is suggestive of similar ore controls. The control of uranium ore deposition by channeled type lithology in the plateau region is fairly well established. The presence of the paleo-stream channel (Unit No. 3) should increase the potential of this property greatly.

RECOMMENDATIONS

The depth of the most favorable horizon precludes the use of drill holes to obtain the necessary geologic

information. The drilling should be grouped into 3 separate stages.

1. Widely spaced drilling to outline gross geologic features.
2. Closely spaced drilling in areas of greatest favorability.
3. Offset drilling outlining possible ore bodies.

The first stage of drilling should attempt to locate the exact position of the truncation of the ore bearing unit and at the same time outline the margins and central portion of the channel sandstone. It is suggested that 4 rows of drill holes trending N55 E be placed as indicated on the map at the end of the report. The holes should be spaced no further than 300 feet apart to insure adequate correlation. Close control should be kept upon structural conditions as drilling progresses. A particular horizon should be chosen as a marker upon which to base structure contours. All holes should penetrate at least to the base of the ore bearing unit which should average about 160 feet in depth. If possible several holes should be drilled to the Unkpapa contact in order not to pass up the possibility of ore grade material within the Lakota Sandstones.

The placing of second stage holes would be based upon the results of the first stage. Several rows of holes would be placed parallel to the trend of the truncation. The holes would be more closely spaced in order to thoroughly explore the possibilities of uranium mineralization. If at this time any favorable structural conditions have been

outlined, several holes should be expended to check the possibility of uranium concentration in these areas.

In all of the drilling the samples should be closely watched for all of the features that have been considered favorable for the concentration of uranium minerals. Such things as abnormal content of carbonaceous or trashy material, abrupt changes in type of cememtation, porosity or permeability, a sharp pinchout or thinning of a horizon could be favorable indicators. The variety of sedimentary features exhibited throughout the Inyan Kara group of sediments tends to increase the difficulties in attempting to establish basic ore guide criteria. This differential lithology in itself is probably the major factor in the localization of ore deposits. It is suggested that the drilling be supervised by a geologist in order to more competently use the information gained.

RECEIVED
JUN 13 1956

M I N I N G D E E D.

THIS INDENTURE, Made this first day of November, 1955, between MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, all of Hot Springs, County of Fall River, State of South Dakota, parties of the first part, and BIG SIOUX URANIUM & MINERAL COMPANY, a corporation, of Sioux Falls, South Dakota, P.O., party of the second part;

WITNESSETH: That the said parties of the first part, for and in consideration of the sum of One Dollar and other good and valuable consideration, to them in hand paid by the said party of the second part, the receipt whereof is hereby acknowledged, have granted, bargained andsold, and by these presents do grant, bargain and sell unto the said party of the second part and to its successors and assigns, the following described lode mining claims situate in Section Thirty-four (34), Township Eight (8) South, Range Four (4) East of the Black Hills Meridian, in the County of Fall River and State of South Dakota, to-wit:

FLAT LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 232.

SUNDAY LODE NO. 1 MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 234.

JIM LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County, in Book 35 of Miscellaneous Records, at page 237.

HULL LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County, in Book 35 of Miscellaneous Records, at page 233.

HANSON NO. 1 LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 235.

HANSON LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 235.

NUMBER FIVE LODE, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 236.

THE PETE LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 237.

THE NUMBER SEVEN LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 236.
THE SUNDAY LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 233.

THE SUNDAY NUMBER TWO LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 234.

together with all the veins, dips, spurs and angles, and also all the metals, ores, veins, ledges, lodes, leads and mineral-bearing rock, earth and material therein or apexing therein or thereunder, and the rights, privileges and franchises thereto incident, appendant and appurtenant, or therewith usually had and enjoyed; and also all and singular the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining, and the rents, issues and profits thereof; and every part and parcel thereof with the appurtenances; expressly excepting from this conveyance an overriding royalty of one per cent (1%) owned by Francis Michaud and Mary M. Michaud, and an overriding royalty of one per cent (1%) owned by Melvin Hanson and Jessie Hanson.

TO HAVE AND TO HOLD, all and singular, the said premises, together with the appurtenances and privileges thereto incident, unto the said party of the second part, its successors and assigns,

forever.

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

Melvin Hanson
Jessie Hanson
Francis Michaud
Mary M. Michaud

* * *

STATE OF SOUTH DAKOTA)
) ss.
County of Pennington.)

On this first day of November, 1955, before me, the undersigned officer, a Notary Public within and for said County and State, personally appeared MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, known to me to be the persons who are described in and who executed the within instrument, and acknowledged to me that they executed the same for the purposes therein contained.

My commission expires
March 1st 1957

(SEAL)

J E Rumsey
Notary Public.

33337

Melvin Thurmond et al

TO

Reginald Thurmond

Manuel C.

STATE OF SOUTH DAKOTA
COUNTY OF FALL RIVER } SS

FILED FOR RECORD
23 DAY OF Nov 19 93
AT 9:00 O'CLOCK A M AND RECORDED IN
BOOK 38 MISC PAGE 339-340
Beverly K. Montgomery
REGISTER OF DEEDS

FEE $ 10.00 PD

Deputy

J. H. Bottum Jr.
Rapid City, S.D.

RECORDED ✓
COMPARED ✓
INDEXED ✓

RECEIVED
JUN 13 1956

M I N I N G D E E D.

THIS INDENTURE, Made this first day of November, 1955, between MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, all of Hot Springs, County of Fall River, State of South Dakota, parties of the first part, and BIG SIOUX URANIUM & MINERAL COMPANY, a corporation, of Sioux Falls, South Dakota, P.O., party of the second part;

WITNESSETH: That the said parties of the first part, for and in consideration of the sum of One Dollar and other good and valuable consideration, to them in hand paid by the said party of the second part, the receipt whereof is hereby acknowledged, have granted, bargained and sold, and by these presents do grant, bargain and sell unto the said party of the second part and to its successors and assigns, the following described lode mining claims situated in the County of Fall River and State of South Dakota, to-wit:

NIGGAR-HILL LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 185;

HANS LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 188.

THE CANYON LODE MINING CLAIM, recorded in the office of the Register of Deeds of said Fall River County in Book 35 of Miscellaneous Records, at page 189;

all of which claims are located in Section Twenty-five (25), Township Eight (8) South, Range Four (4) East of the Black Hills Meridian;

together with all the veins, dips, spurs and angles, and also all the metals, ores, veins, ledges, lodes, leads and mineral-bearing rock, earth and material therein or apexing therein or thereunder, and the rights, privileges and franchises thereto incident, appendant and appurtenant, or therewith usually had

and enjoyed; and also all and singular the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining, and the rents, issues and profits thereof; and every part and parcel thereof with the appurtenances; subject to an overriding royalty owned by Everett Hill and Marie Hill of twelve and one-half per cent (12½%), and a one-half of one per cent (½%) overriding royalty owned by Francis Michaud and Mary M. Michaud, and a one-half of one per cent (½%) overriding royalty owned by Melvin Hanson and Jessie Hanson.

TO HAVE AND TO HOLD, all and singular, the said premises, together with the appurtenances and privileges thereto incident, unto the said party of the second part, its successors and assigns, forever.

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

Melvin Hanson
Jessie Hanson
Francis Michaud
Mary M. Michaud

* * *

STATE OF SOUTH DAKOTA)
) ss.
County of Pennington.)

On this first day of November, 1955, before me, the undersigned officer, a Notary Public within and for said County and State, personally appeared MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, known to me to be the persons who are described in and who executed the within instrument, and acknowledged to me that they executed the same for the purposes therein contained.

My commission expires
November 14 - 1957

A E Rimmer
Notary Public.

33335

Transmission Line

TO

Rights of Way

Mineral G.

STATE OF SOUTH DAKOTA
COUNTY OF FALL RIVER, SS

FILED FOR RECORD

22 DAY OF Dec 10 55

AT 9:00 M. AND RECORDED IN

BOOK 38 MISC PAGE 437-438

Beatrice R. Montgomery
REGISTER OF DEEDS

FEE $

Mail Recorded Return

RECORDED ✓

COMPARED ✓

INDEXED ✓

RECEIVED
JUN 13 1956

ASSIGNMENT OF MINING LEASE AND AGREEMENT.

WE, MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, all of Hot Springs, County of Fall River, State of South Dakota, for and in consideration of One Dollar and other good and valuable consideration, do hereby assign, transfer and set over unto BIG SIOUX URANIUM & MINERAL COMPANY, a corporation, of Sioux Falls, South Dakota, P.O., all our right, title and interest in and to that certain Lease and Agreement entered into by and between Everett Hill and Marie Hill, the Lessors, and Francis Michaud and Melvin Hanson, the Lessees, on March 4, 1955, whereby the said Lessor leased and let unto the said Lessees, under the terms and conditions therein stated, the following described real property situate in the County of Fall River and State of South Dakota, to-wit:

Nigger Lode Mining Claim recorded in Book 35 Miscellaneous in the Office of Register of Deeds, Fall River County, South Dakota at page 185, and

Side Hill Lode Mining Claim recorded in Book 35 Miscellaneous in the Office of Register of Deeds, Fall River County, South Dakota at page 189, except over-riding royalty of ½ of 1% retained by Francis Michaud and Mary M. Michaud, and overriding royalty of ½ of 1% retained by Melvin Hanson and Jessie Hanson.

IN WITNESS WHEREOF THE parties hereto have signed this instrument this 1st day of November, 1955, in Rapid City, South Dakota.

Melvin Hanson
Jessie Hanson
Francis Michaud
Mary M. Michaud

STATE OF SOUTH DAKOTA)
) ss.
County of Pennington.)

On this first day of November, 1955, before me, A. E. Reimers, a Notary Public within and for said County and State, personally appeared MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, known to me to be the persons who are described in and who executed the within and foregoing instrument, and acknowledged to me that they executed the same for the purposes therein contained.

My commission expires [illegible], 1957.

A. E. Reimers
Notary Public.

33339

Melvin Thomas et al

TO

Big Sioux Pipeline Inc
Merrill A.

STATE OF SOUTH DAKOTA
COUNTY OF FALL RIVER SS

FILED FOR RECORD
23 DAY OF Nov 1955
AT 9:00 A.M. RECORDED IN
BOOK 38 MISC 435-436
Beulah N. Montgomery
REGISTER OF DEEDS

FEE $ 10.00 PD

J. H. Bollum Jr.
Deputy City Auditor

RECORDED ✓
COMPARED
INDEXED

RECEIVED
JUN 13 1956

ASSIGNMENT OF MINING LEASE AND AGREEMENT.

WE, MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, all of Hot Springs, County of Fall River, State of South Dakota, for and in consideration of One Dollar and other good and valuable consideration, do hereby assign, transfer and set over unto BIG SIOUX URANIUM & MINERAL COMPANY, a corporation, of Sioux Falls, South Dakota, P.O., all our right, title and interest in and to that certain Mining Lease and Agreement executed by Abram E. McClure, as Lessor, and the undersigned, as Lessees, whereby the said Lessor leased and let to the said Lessees, under the terms and conditions therein stated, the following described real property situate in the County of Fall River and State of South Dakota, to-wit:

> The Southwest quarter (SW¼) of Section Twenty-nine (29), and the Northwest quarter (NW¼) of Section Thirty-two (32), in Township Eight (8) South, Range Four (4) East of the Black Hills Meridian, except over riding Royalty of 1% retained by Francis & Mary M. Michaud, and 1% retained by Melvin Hanson and Jessie Hanson.

which Mining Lease and Agreement bears date the 8th day of October, 1954.

Dated this first day of November, 1955.

Melvin Hanson
Jessie Hanson
Francis Michaud
Mary M. Michaud

STATE OF SOUTH DAKOTA)
) ss.
County of Pennington.)

On this first day of November, 1955, before me, the undersigned officer, a Notary Public within and for said County and State, personally appeared MELVIN HANSON and JESSIE HANSON, husband and wife, and FRANCIS MICHAUD and MARY M. MICHAUD, husband and wife, known to me to be the persons who are described in and who executed the within instrument, and acknowledged to me that they executed the same for the purposes therein contained.

My commission expires

[illegible]

A. E. [illegible]
Notary Public.

SEAL.

33336

Martin Thomas et al

TO

Big Bend Irrigation District C.

STATE OF SOUTH DAKOTA }
COUNTY OF FALL RIVER } SS

FILED FOR RECORD

23 DAY OF Nov 19 25

AT 9:00 A.M. AND RECORDED IN

BOOK 38 MIDC 438-439

Martha N. Montgomery

REGISTER OF DEEDS

FEE $ _____

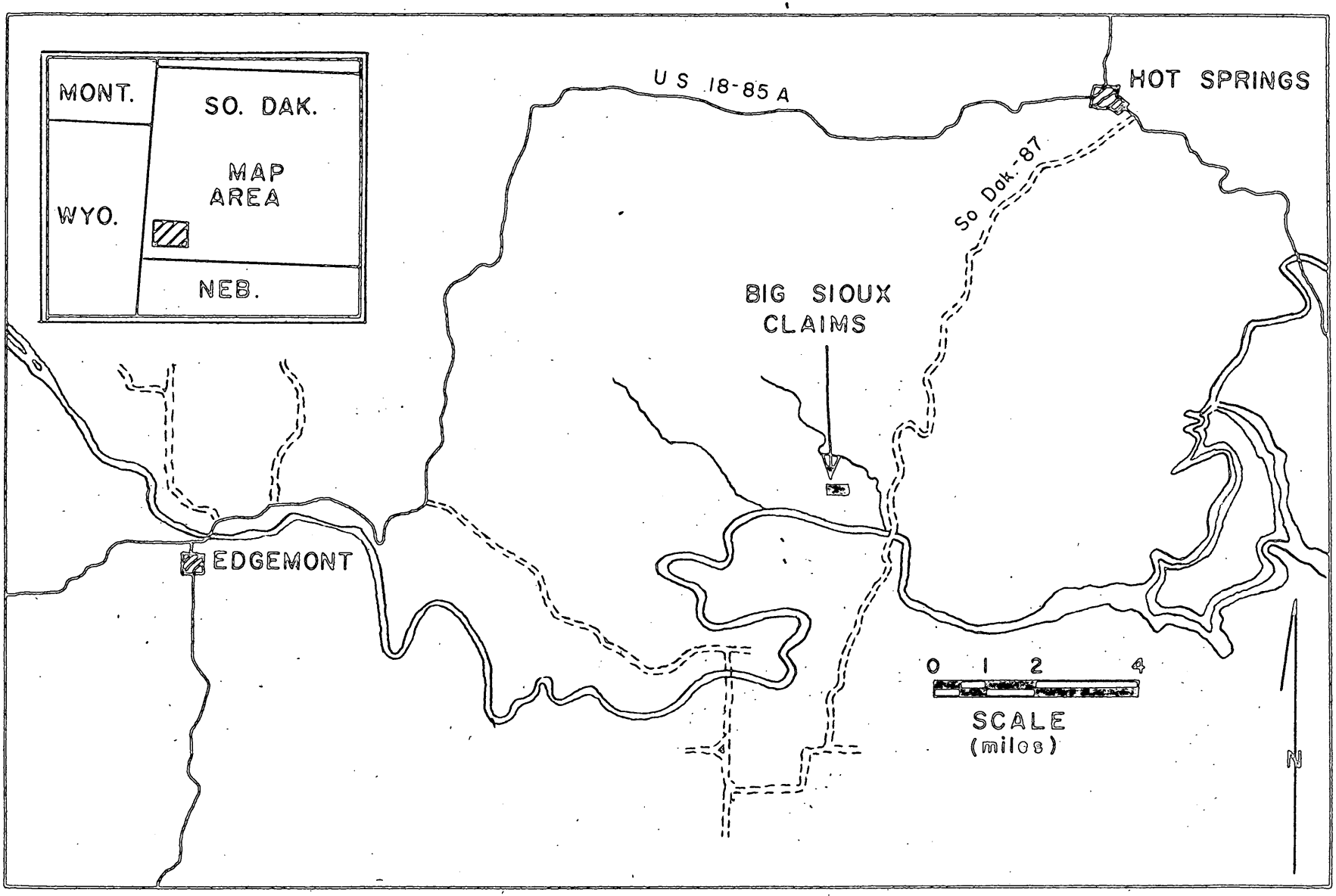
Mica Recorded Notary

TO _____

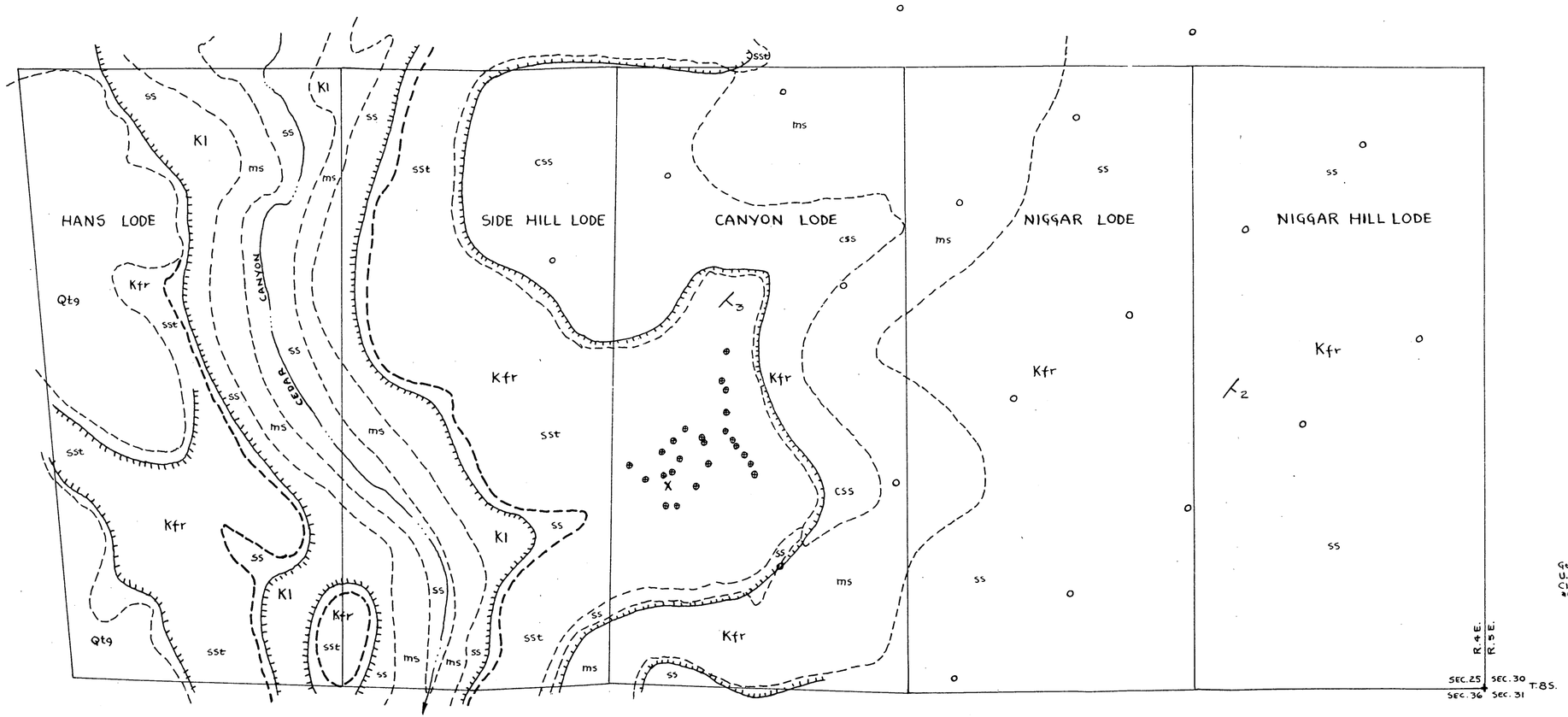
RECORDED ✓

COMPARED ✓

INDEXED ✓


MONT.
SO. DAK.
MAP AREA
WYO.
NEB.
U S 18-85 A
HOT SPRINGS
So Dak. 87
BIG SIOUX CLAIMS
EDGEMONT
0 1 2 4
SCALE (miles)
N

INDEX MAP



EXPLANATION

INYAN KARA GROUP

Qtg — Terrace gravel

Kfr — Fall River formation (ss, ms, sst, css)

Kl — Lakota formation incl. Fuson formation (ss)

LOWER CRETACEOUS QUAT.

Rock Types
ss, sandstone
ms, mudstone
sst, sandstone-siltstone
css, channel sandstone

Approximate rock unit contact

Approximate Fall River-Lakota contact.

Strike and dip of bedding

Cliffs

X Canyon lode deposit

Wagon drill hole

Proposed drill hole

SCALE

1 inch = 200 feet

0 200 400 600 feet

SOURCE OF INFORMATION
Geology and topography from E.V. Post, U.S. Geological Survey.
Claim boundaries from Big Sioux Uranium and Mineral Co., Inc.

TRUE NORTH
MAGNETIC NORTH
14°

D. Richter, Aug. 1956

FIGURE 2

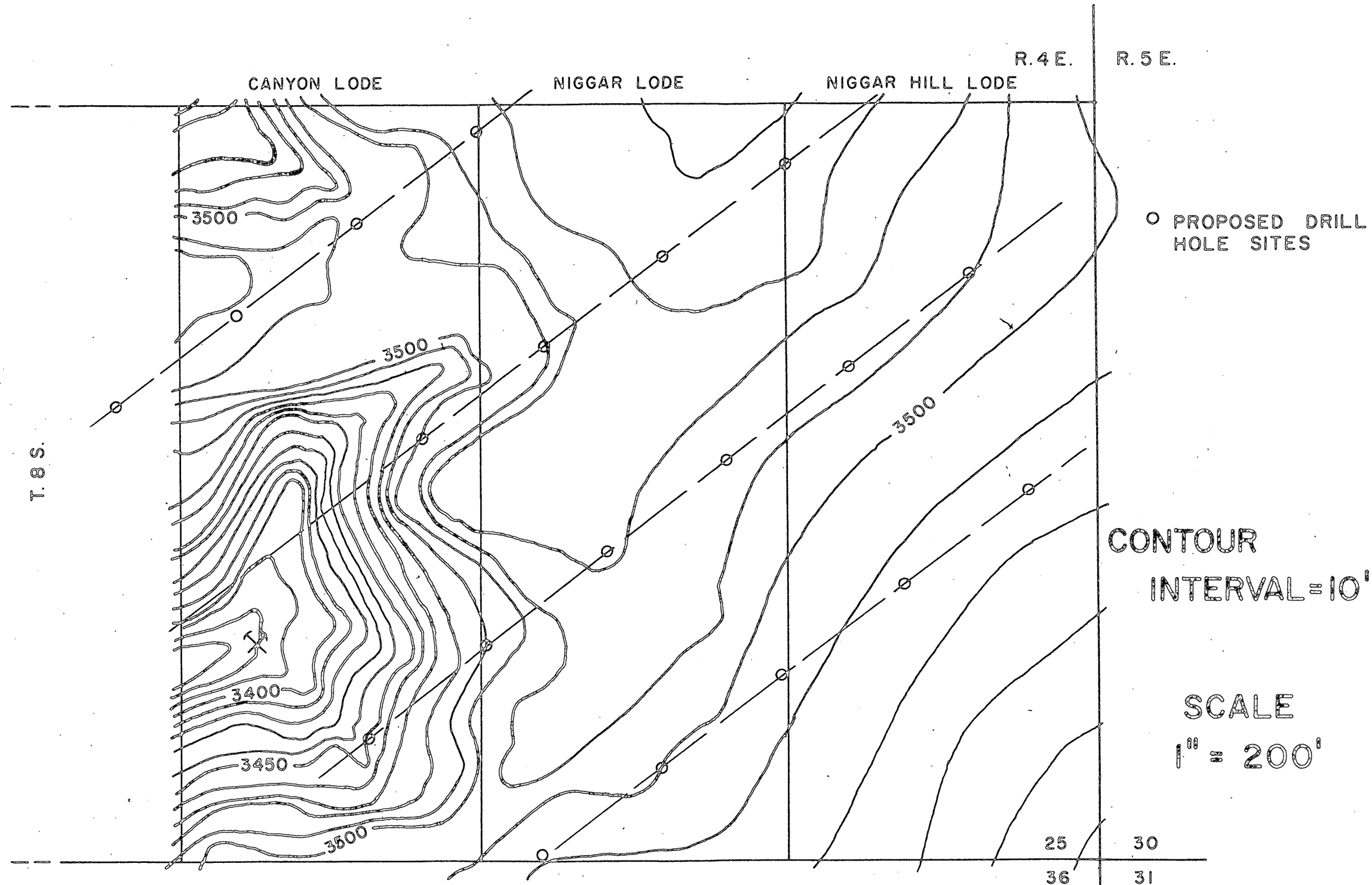
GEOLOGY AND LOCATION MAP

Cedar Canyon claim group, Big Sioux Uranium and Mineral Company, Inc.

Fall River County, South Dakota

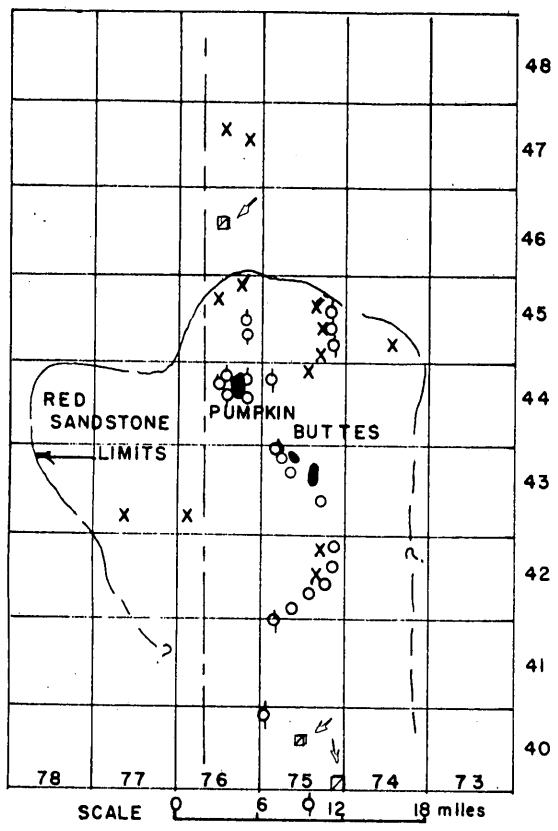
RECEIVED
SEP 17 1956

RECEIVED
SEP 17 1956

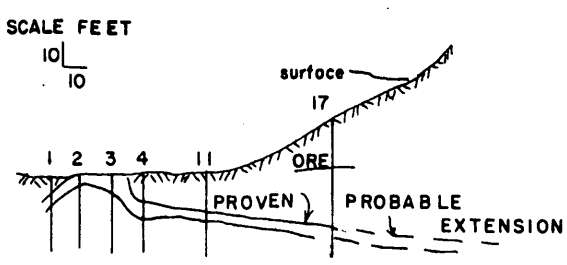


MAP SHOWING PROPOSED DRILL HOLE LOCATIONS

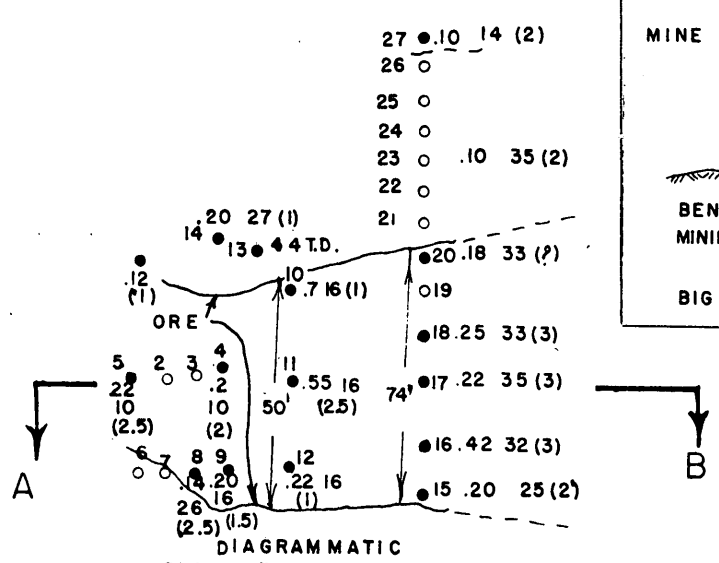
R.B.H 3/27/56



WYOMING PROPERTIES



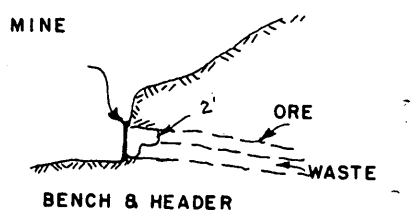
SECTION A—B



DIAGRAMMATIC PLAN OF DRILLED HOLES

BIG SIOUX MINE

CANYON LODE



BENCH & HEADER MINING METHOD FOR BIG SIOUX MINE

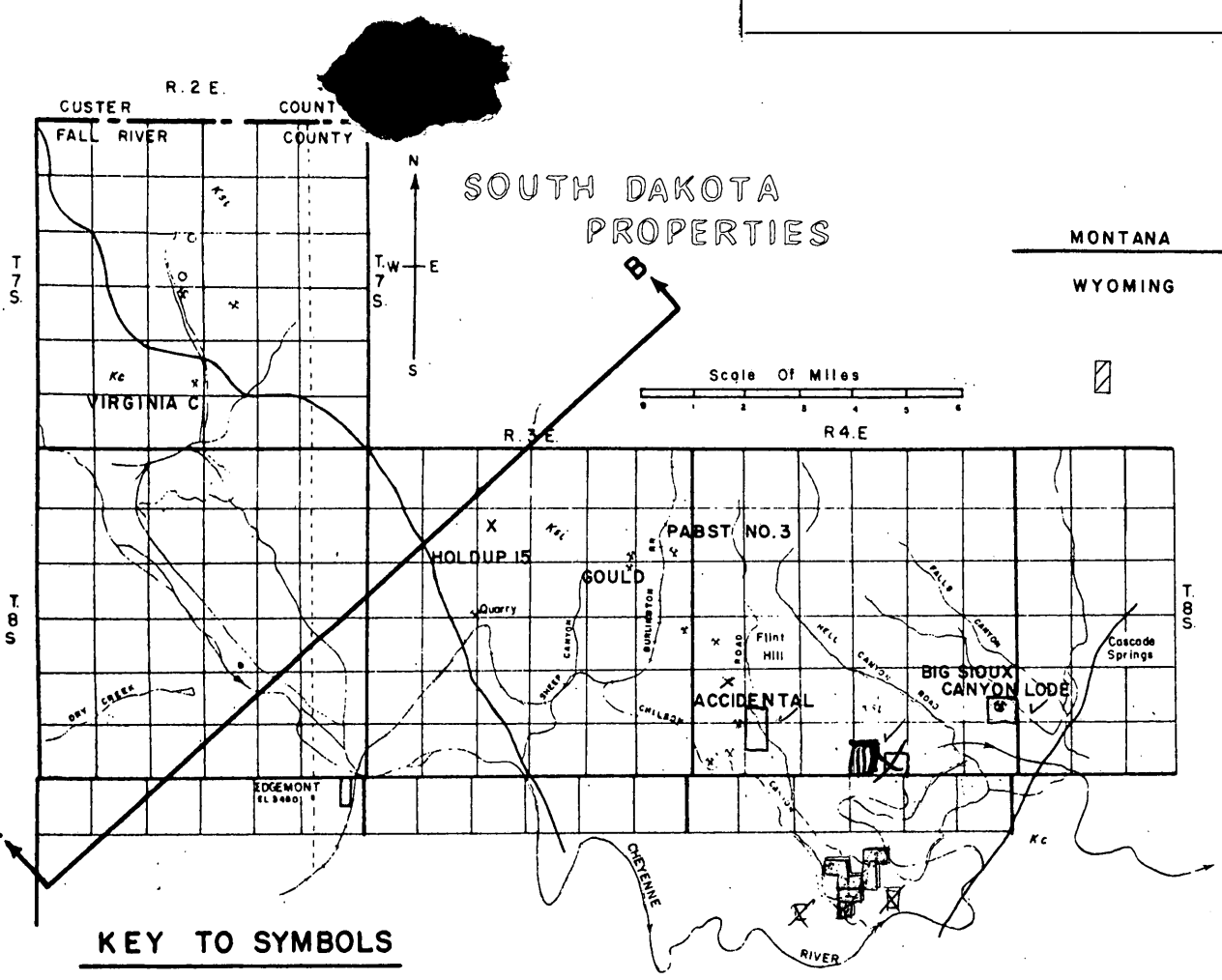
KEY:

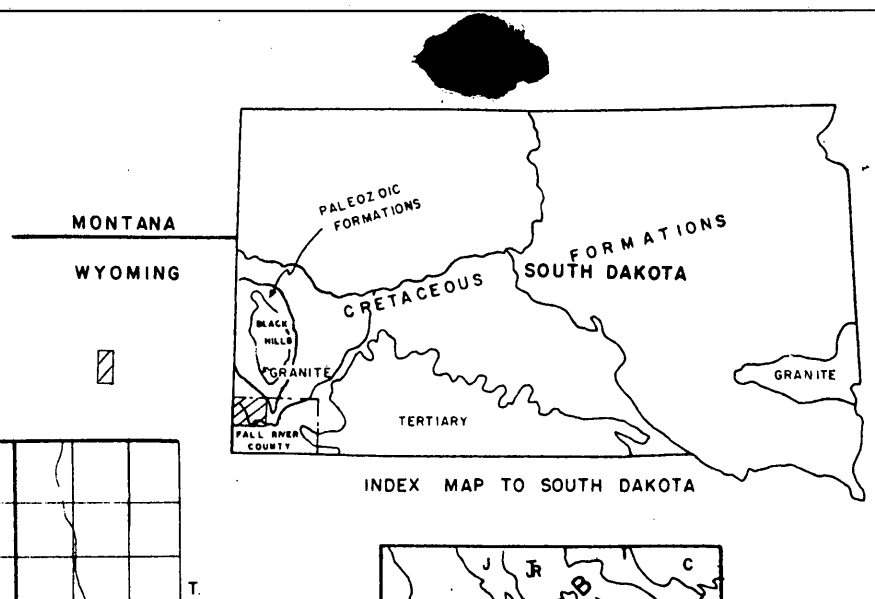
5 HOLE NUMBER

.22 % U_3O_8 ore analysis by geiger counter

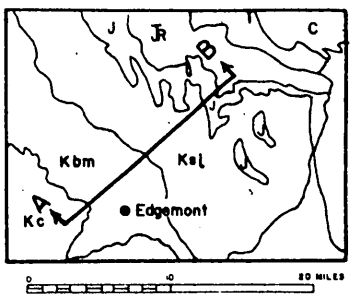
10 Depth to ore by foreman

(2 1/2) Thickness of ore

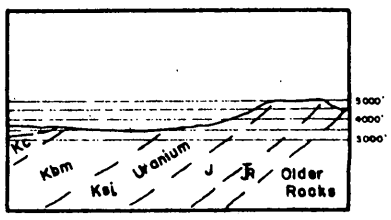




INDEX MAP TO SOUTH DAKOTA



SURFACE GEOLOGY



DIAGRAMATIC SECTION

A —— B

KEY TO SYMBOLS

Upper Cretaceous	Kc	Carlile Shale
	Kbm	Belle Fourche - Mowry
Lower Cretaceous	Ksl	Skull Creek — Inyan Kara (Uranium Producer)
Jurassic	J	Morrison - Sundance
Jur-Triassic	Jr	Spearfish

Ksl: SKULL CREEK SHALE; FALL RIVER SANDSTONE; FUSON SHALE; LAKOTA SANDSTONE

✕ Known Mine

○ Radioactive Surface

▨ Properties Analyzed

GEOLOGICAL RECONNAISSANCE

BIG SIOUX URANIUM & MINERAL CO.

SIOUX FALLS, SOUTH DAKOTA

PROPERTIES:

SOUTH DAKOTA & WYOMING

Based On Field Radioactive Surveys And U. S. Geol. Survey And AEC Data

By F. N. Besco Member Rocky Mtn. Assn Geol Professional Engineers

701 Midland Saving Bldg Denver Colorado Dec. 10, 1954 Nov 1955

North, Range Seventy-six (76) West of the Black Hills Meridian.

LEASES — SOUTH DAKOTA

1. Abram E. McClure Lease consisting of the following described real property situate in the County of Fall River, State of South Dakota:

   Southwest Quarter (SW¼) of Section Twenty-nine (29) and Northwest Quarter (NW¼) of Section Thirty-two (32) Township Eight (8) South, Range Four (4) East of the Black Hills Meridian.

2. Edith McClure Lease consisting of the following described real property situate in the County of Fall River, State of South Dakota:

   North Half of Southeast Quarter (N½SE¼) and Southeast Quarter of the Southeast Quarter (SE¼SE¼) of Section Nine (9), Southwest Quarter of Southwest Quarter (SW¼SW¼), East Half of the Southwest Quarter (E½SW¼), Southeast Quarter of the Northwest Quarter (SE¼NW¼) and Southwest Quarter of the Northeast Quarter (SW¼NE¼) of Section Ten (10); East Half of the Northeast Quarter (E½NE¼) and Southwest Quarter of the Northeast Quarter (SW¼NE¼) of Section Sixteen (16), Northwest Quarter of the Northwest Quarter (NW¼NW¼) of Section Fifteen (15) Township Nine (9) South Range Four (4) East of the Black Hills Meridian.

MINING CLAIMS — ALL LOCATED IN FALL RIVER COUNTY, STATE OF SOUTH DAKOTA:

Niggar-Hill Lode recorded in Book 35 Misc., page 185. Niggar-Lode recorded in Book 35 Misc., page 185. Side Hill Lode recorded in Book 35 Misc., page 189. Hans Lode recorded in Book 35 Misc., page 186. The Canyon Lode recorded in Book 35 Misc., page 189. All of said claims are situate in Section Twenty-five (25) Township Eight (8) South, Range Four (4) East of the Black Hills Meridian.

The following claims are situate in Section Thirty-four (34) Township Eight (8) South, Range Four (4) East of the Black Hills Meridian. Flat Lode recorded in Book 35 Misc., page 232. Sunday Lode No. 1 recorded in Book 35 Misc., page 234. Jim Lode recorded in Book 35 Misc., page 237. Hull Lode recorded in Book 35 Misc., page 233. Hanson No. 1 Lode recorded in Book 35 Misc., page 235. Hanson Lode recorded in Book 35 Misc., page 235. Number Five Lode recorded in Book 35 Misc., page 236. The Pete Lode recorded in Book 35 Misc., page 237. The Number Seven recorded in Book 35 Misc., page 236. The Sunday Lode recorded in Book 35 Misc., page 233. The Sunday Number Two Lode recorded in Book 35 Misc., page 234.

OVERRIDING ROYALTIES

The Niggar Lode, Side Hill Lode, Niggar-Hill Lode, Hans Lode, Canyon Lode are subject to overriding royalties of Thirteen and One Half Per Cent (13½%). The Flat Lode, Sunday Lode No. 1, Jim Lode, Hull Lode, Hanson No. 1 Lode, Hanson Lode, Number Five Lode, the Pete Lode, the Number Seven Lode, the Sunday Lode and the Sunday No. 2 Lode are subject to an overriding royalty of Two Per Cent (2%). On the McClure Lease there is an overriding royalty of Fourteen and One Half Per Cent (14½%). On the Wyoming Least there is an overriding royalty of Seven and One Half Per Cent (7½%).

GEOLOGY

A preliminary geological reconnaissance of the South Dakota properties was made by F. N. Bosco, Geologist, of Denver, Colorado.

Mr. Bosco reported to the Company, concerning the South Dakota properties as follows:

"All the properties, as shown on the accompanying map, contain surface exposures of the Inyan Kara (Dakota) formation, which is the only reported commercial uranium producing formation in South Dakota."

"Although the reconnaissance was brief, sufficient mineralization was observed to indicate the probable presence of uranium ore (commercial mineral deposits) and undoubtedly many more surface exposures will be revealed by additional field work."

"Even in the best mines, in practically every instance, the surface indications were small, since weathering will have removed all but those best protected exposures, as in overhanging cliffs, leeward side of sheltered canyons etc. Every small showing where opened by excavation has proven to be a large deposit."

Referring to the South Dakota properties Mr. Bosco went on to say:

"A carefully surveyed drilling program is recommended on small exposures as the least expensive means of blocking out ore ahead of actual mining. Low cost mining can now be conducted on the Canyon Lode Mine. Ten tons of ore are ready for shipment."

"The use of a drill presupposes access roads. During construction of access roads great care and close professional supervision should be maintained, both to avoid useless excavation, and to avoid overlooking a radioactive or visible uranium indication. The same excavation equipment should be used to open ore bodies and start development."

INTRODUCTORY STATEMENT

Big Sioux Uranium & Mineral Company, hereafter referred to as the Company, was incorporated September 29th, 1955 under the laws of the State of South Dakota for the purpose of acquiring, developing and operating properties in the search for uranium, associated minerals and oil. The Company's main office is at 1209 South Main Avenue, Sioux Falls, S. D. The Company has been duly qualified to do business in the State of South Dakota.

MANAGEMENT AND CONTROL

The following are officers and directors of the Company:

NAME	ADDRESS	OFFICE
W. A. Palm	Flandreau, South Dakota	President, Director
Francis Michaud	Hot Springs, South Dakota	Vice President, Director
Elgin Poole	Sioux Falls, South Dakota	Secretary, Treasurer, Director
Wm. P. Haley	Rapid City, South Dakota	Director
R. C. Gage	Sioux Falls, South Dakota	Director

W. A. Palm, President, Director, Promoter. Mr. Palm owns and operates the Palm Chevrolet Company in Flandreau, South Dakota. Mr. Palm is well qualified, by many years of business experience, to serve the Company in the position to which he has been elected.

Francis Michaud, Vice President, Director, Promoter. Mr. Michaud has been active in the mining industry for many years. His background, consisting of actual mining experience over a period of 36 years, insures the board of first-hand knowledge in matters of property development.

Elgin Poole, Secretary-Treasurer, Director, Promoter. Mr. Poole has been associated with the Equitable Life Assurance Co. for many years. His business experience and personal contacts qualify him for the position which he holds.

Wm. P. Haley, Director, Promoter. Mr. Haley has been a successful merchant in Rapid City for many years. He has been very active in the oil and mining industries, as a lease broker, for many years. His experience with the intricacies of property procurement and evaluation will be of great advantage to the Company.

R. C. Gage, Director. Mr. Gage, President of the Great Plains Seed Company, is well equipped by reason of his many years of experience in management, to be of service to the Company as a Director.

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HISTORY

Mr. Palm, Mr. Poole, Mr. Michaud, Mr. Haley, Mr. Melvin Hanson of Hot Springs, South Dakota and Mr. Joe Bottum Jr. of Rapid City, South Dakota being owners separately and together of a group of mining properties in the Pumpkin Buttes, Wyoming area and the Edgemont, South Dakota area met on the 26th of September 1955. The meeting resulted in the formation of the Company.

It was agreed that the owners would transfer their properties to the Company for $170,000.00. This amount has been paid to the owners as follows:

NAME	STOCK	CASH
Mr. Palm	20,000 shares	-0-
Mr. Poole	20,000 shares	-0-
Mr. Bottum	20,000 shares	-0-
Mr. Michaud	20,000 shares	$ 5,000.00
Mr. Haley	40,000 shares	$20,000.00
Mr. Hanson	-0-	$25,000.00
TOTAL	120,000 shares	$50,000.00

The stock issued, to the promoters, in exchange for the properties will be held for investment by them. None of this stock will be placed on the market before this issue is completely sold.

The monies to be paid for the properties will come from the proceeds of this issue. Notes, for the amounts due, have been issued to the individuals to whom it is owed by the Company.

The promoters of the Company, Mr. Palm, Mr. Poole, Mr. Bottum, Mr. Michaud and Mr. Haley are receiving stock totaling 24% of the authorized capital of the Company in exchange for their properties. If and when the entire issue is sold the promoters will own 28% of the then outstanding stock for which they will have given properties, arbitrarily valued by them, at $170,000.00. The balance of the stockholders will have paid $300,000.00 for 72% of the then outstanding stock.

PROPERTIES

LEASES — WYOMING

1. Lease number 019034 consisting of the following described real property situate in the County of Converse, State of Wyoming:

   Section Sixteen (16) and Section Thirty-six (36), Township Forty (40) North, Range Seventy-five (75) West of the Black Hills Meridian.

2. Lease number 019033 consisting of the following described real property situate in the County of Campbell, State of Wyoming:

   Section Sixteen (16), Township Forty-six (46)

BIG SIOUX MINE

S½ Section 25, Township 8 South, Range 4 East

"This is located on 5 claims extending 3,000 feet west and ½ mile north from the southeast corner of section 25, T.8S., R.4E., along Mike and Cedar Canyons and adjacent ridges."

"A passable ranch road on the ridge crosses between the canyons, considerable bulldozer work has been done to open up the radioactive horizon observed in about the center of the SW¼ of Section 25, which ore horizon extends across the property. Total relief in this area is about 300 feet with some moderate to steep slopes."

"Uranium was indicated by scintillation reading with an increase of .10 MR over a background count of .02 MR, and an A.E.C. sample reported as .08% uranium, obtained by Mr. Michaud in the exposure in Cedar Canyon, in Dec. 1954. In November 1955, this deposit has now been proven commercial with ten tons of ore stockpiled and a drilled ore horizon extending across an area 50 feet by 100 feet, averaging over two feet thick, or over 200 tons proven, average grade over twenty hundredths, $30.00 per ton. Some of this is fifty hundredths U308 ($79.50 per ton)."

"It must be realized that this two feet of ore can reasonably be expected to extend across 80% of the area, and it may thicken to ten or twelve feet as do most other deposits in the area."

"The Big Sioux Mine known deposit is in the lower Fall River Formation, according to Francis Michaud as told to him by A.E.C. geologists who observed drilling of the property, which identification is confirmed."

"As stated the exposed ore is in the lower Fall River Formation. This leaves the Dakota, Fuson, and Lakota sedimentary formations as additional possible ore producers, still untested."

"The Atomic Energy Commission plans an immediate drilling test thru these three lower horizons and the results should prove some valuable ore horizons."

Concerning the Wyoming properties of the Company Mr. Bosco observed:

"Both these areas warrant detailed examination in the near future since they have possibilities for large uranium deposits."

USE OF FUNDS

In the event all of the shares common stock offered herein are sold, the estimated proceeds to the Company will be $300,000.00 less $45,000.00 sales commissions. Net proceeds to the Company will be approximately $255,000.00. Provided that the sum set forth is available, the monies derived from the sale of stock will be expended for the purposes, as well as priority usage, as follows:

(a) $ 1,000.00 - expense incurred relative to this public offering.

(b) $50,000.00 - payment of notes given for properties.

(c) $35,000.00 - purchase of equipment necessary to mine and develop proven properties.

(d) $40,000.00 - expense in connection with construction of roads and development of proven properties.

(e) $50,000.00 - drilling, excavation for exploration of balance of properties including geology.

(f) $50,000.00 - reserve for acquisition of additional properties.

(g) $29,000.00 - surplus & reserve for operations.

Inasmuch as there is no underwriting commitment to purchase the shares being offered or there being no contracts with brokers or underwriters to guarantee the sale of Issuer's stock, there is no assurance that all or any of such shares will be sold, or that any proceeds thereof will be available. If such is the case, no arrangement has been made to refund any amounts paid for such shares in event that funds sufficient for the purposes given are not raised. Issuer reserves the right to change the above contemplated uses to expedite its business needs.

PROSPECTUS

BIG SIOUX

URANIUM & MINERAL CO.

(A South Dakota Corporation)

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300,000 SHARES
COMMON STOCK
(Par Value $1.00 Per Share)

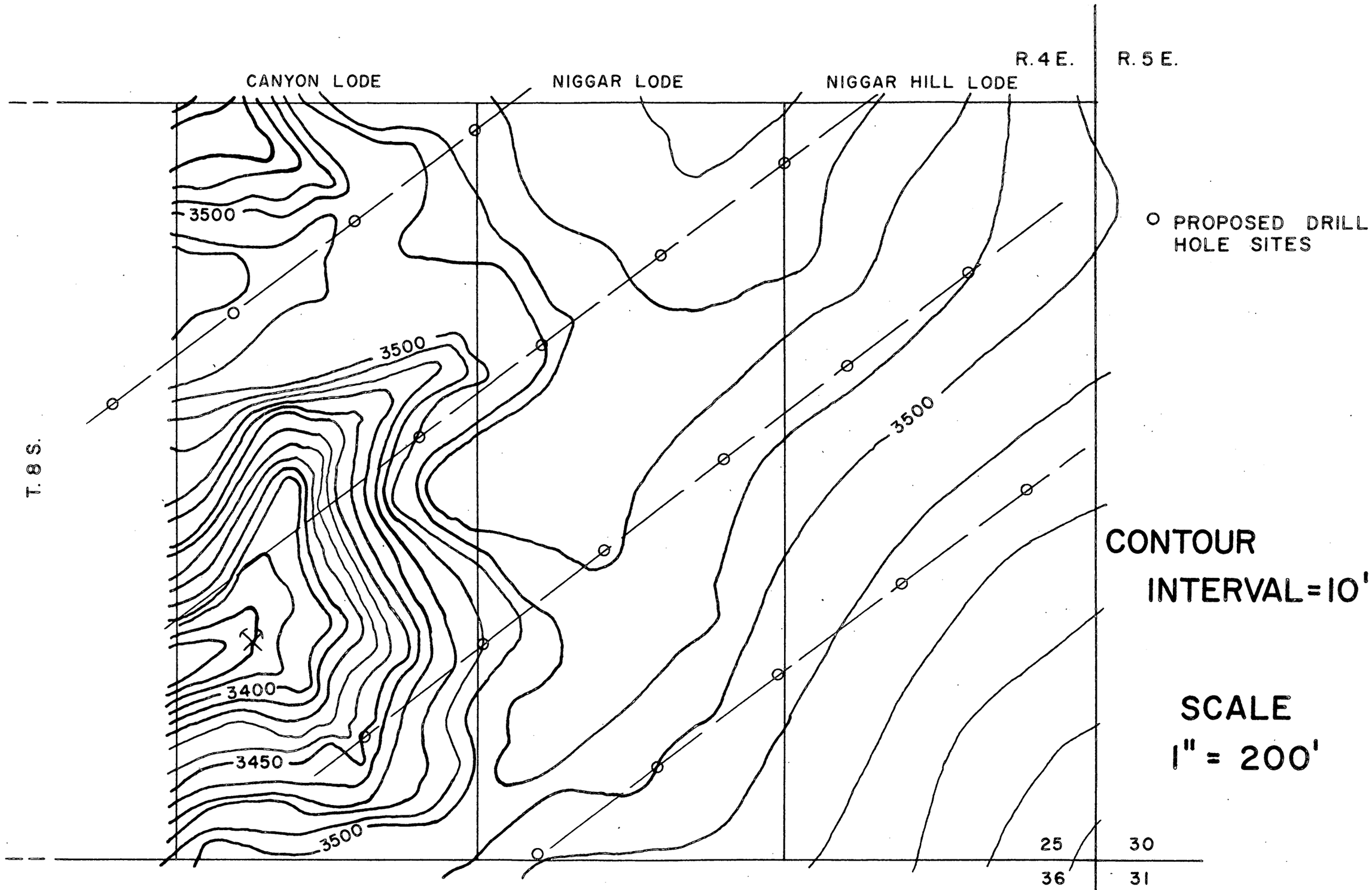
THESE SECURITIES ARE OFFERED AS A SPECULATION

	PRICE TO PUBLIC	SALES COMMISSION	PROCEEDS TO CO.
TOTAL OFFERING	$300,000.00	$45,000.00	$255,000.00*
PER SHARE	$1.00	$.15	$.85

*These proceeds to the Company are after deducting the Sales Commissions but before other expenses incurred by the Company in the sale of these securities. Other sales expenses incurred, which shall be paid by the Company, shall not exceed $1,000.00.

THIS STOCK IS OFFERED FOR SALE TO BONAFIDE RESIDENTS OF THE STATE OF SOUTH DAKOTA ONLY - UNDER AN EXEMPTION FROM REGISTRATION WITH THE SECURITIES EXCHANGE COMMISSION CLAIMED BY THE COMPANY.

The date of this prospectus is December 27, 1955.



MAP SHOWING PROPOSED DRILL HOLE LOCATIONS

R.B.H 3/27/56

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JUN 29 1955

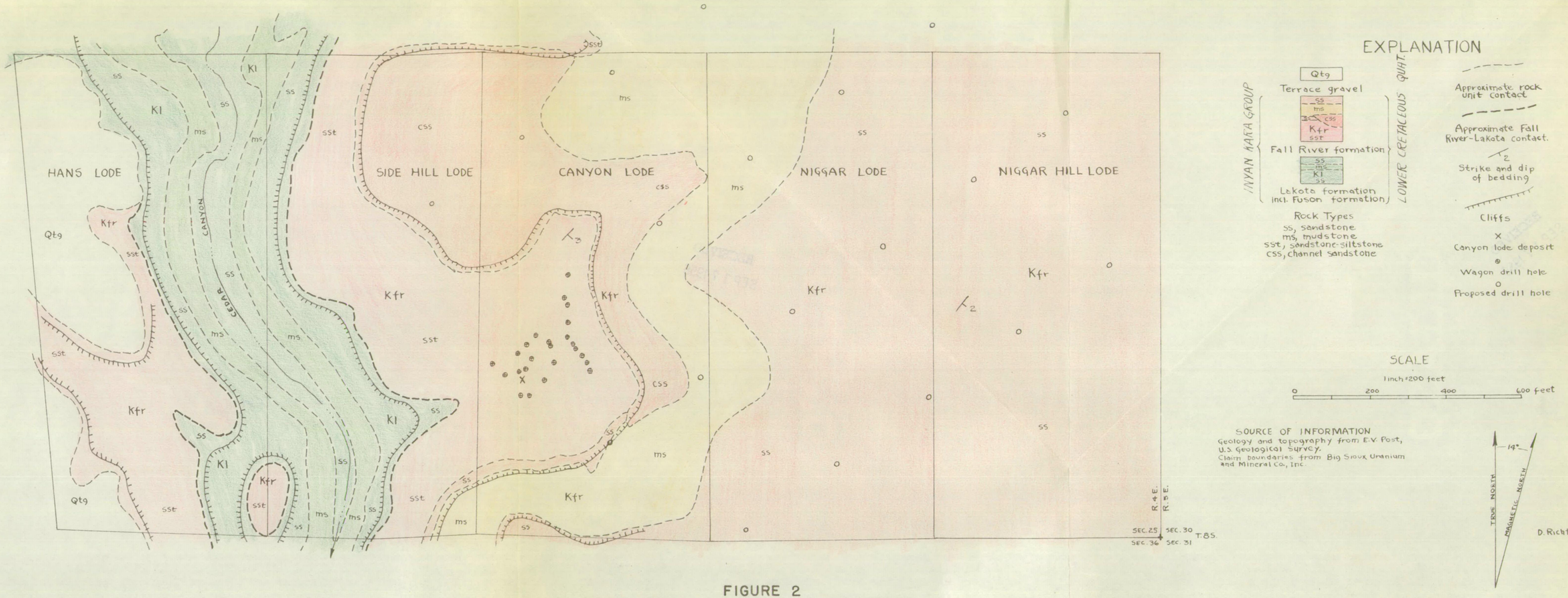

FIGURE 2

GEOLOGY AND LOCATION MAP

Cedar Canyon claim group, Big Sioux Uranium and Mineral Company, Inc.

Fall River County, South Dakota

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RETURN RECEIPT REQUESTED

MR. C. O. MITTENDORF, ADMINISTRATOR
DEFENSE MINERALS EXPLORATION ADMINISTRAT
U. S. DEPARTMENT OF THE INTERIOR
WASHINGTON 25, D. C.

INTERIOR D.C.T.
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MAIL CENTER

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347992

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UNITED STATES
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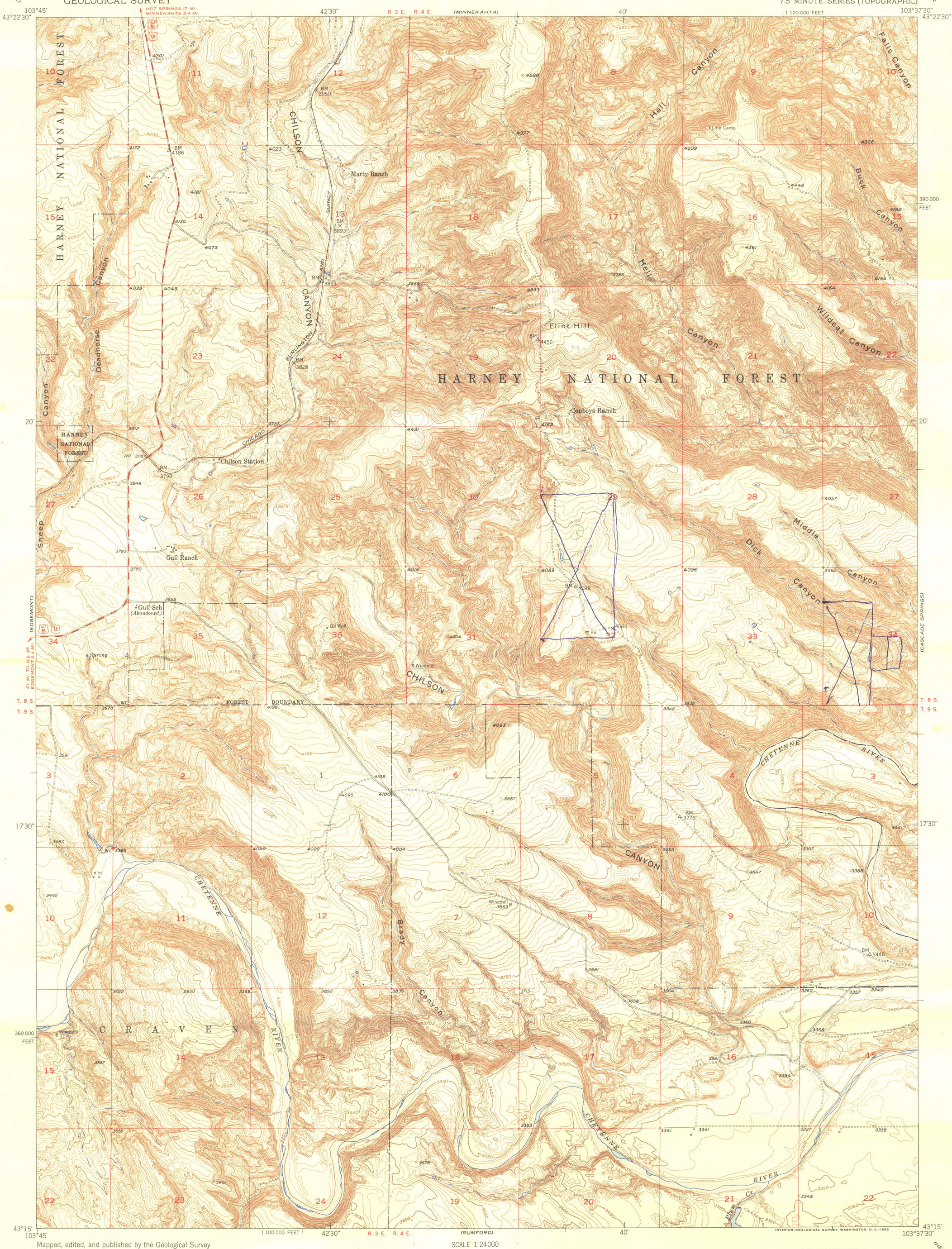
GEOLOGICAL SURVEY

FLINT HILL QUADRANGLE

SOUTH DAKOTA-FALL RIVER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



INTERIOR-GEOLOGICAL SURVEY, WASHINGTON, D. C.-1952

Mapped, edited, and published by the Geological Survey as part of the Department of the Interior program for the development of the Missouri River Basin

Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1949. Field check 1950

Polyconic projection. 1927 North American datum
10,000-foot grid based on South Dakota coordinate system, south zone

TRUE NORTH
MAGNETIC NORTH
14°
APPROXIMATE MEAN DECLINATION, 1950

SCALE 1:24000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Heavy-duty — 4 LANE | 6 LANE
Medium-duty — 4 LANE | 6 LANE
Light-duty
Unimproved dirt
U. S. Route
State Route

FLINT HILL, S. DAK.
N4315—W10337.5/7.5

1950

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, FEDERAL CENTER, DENVER, COLORADO OR WASHINGTON 25, D. C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST