DMEA Form 9
(Rev. 5/57)

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE

Idm-E No.____

DMEA NO. 4751

Application (Denied
(~~Withdrawn~~
(After disposition, delete items not applicable)

Contract
(Terminated - not Certified
(Cancelled
(Terminated - Certified
(Royalty Agreement

The records contained in this file are marked (x) and arranged in this order:

Folder No. 1:

Left Side

Royalty Audits 1/
Certification of Discovery
Cost Audits 2/
Termination Notice or Agreement
Recision Notice
Assignment of Contract
Contract Amendments
Contract with all exhibits and annexes
Owner's Consent to Lien
Subordination Agreement
✓ Application and attachments
✓ Envelope for maps

Right Side

Project summary
Work completed analysis
All other material filed in chronological order including the following reports if checked:

Field Team Semi-Annual Report for Certified Project
Final Field Team Report (Tab)
Operator's Final Report (Tab)
Interim Field Team Reports
Operator's monthly reports and all attachments
✓ On-site Exam Report (Tab)
Settlement Sheets
Drill Logs

Additional Folders:

Left Side

Folder No.____:
Analysis of Semi-Annual Inspection Reports
Interim Summary Reports by DMEA Engineers

Right Side

Field Team Semi-Annual Report for Certified Project
Field Team Interim Reports
Operator's Monthly Report with transmittal, narrative, maps.

Folder No.____: Maps (Use pocket folder or envelope.)

Folder No.____: Settlement Sheets

Folder No.____: Drill Logs

Folder No.____: Royalty material

1/ Or reports of royalty review
2/ Or cost reports of review

16592

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

224 New Customhouse
Denver 2, Colorado

July 9, 1957

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 4751 (Uranium) Holly Corporation (Land in Tps. 8 and 9 S., R. 3 E., BHPM) Fall River County, South Dakota

Enclosed is the Applicant's revision to the proposed exploration project included under the subject docket.

One copy of the Applicant's revision was retained by the Geological Survey, one copy is being sent to the Bureau's examining engineer, and one copy is being retained in our file.

The noted changes are the result of the discussion between the Applicant and the Field Examiners following their visit to the property.

W. H. King

W. H. King

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RECEIVED JUL 11 1957

DATE	INITIALS	CODE
7/11	C	220
7/11	[redacted]	700

to note

DMEA
DEPARTMENT OF THE INTERIOR
JUL 9 1957
REGION III
DENVER, COLORADO

AMENDMENTS

TO

APPLICATION FOR AID IN AN EXPLORATION PROJECT

Submitted

by

HOLLY CORPORATION

HOLLY MINERALS DIVISION

340 Third Street NW

P. O. Box 1509

Albuquerque, New Mexico

7-1448

July 6, 1957

DMEA Docket No. 4751

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This amendment includes changes in items 5b, 5d, 6a, and 6h. The changes in 5d are necessitated by the resignation of W. A. Carlson. Those in 5b, 6a, and 6h introduce an alternate proposal for the initital exploration or Phase I stage of the project.

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DMEA
DATE
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5 (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.....

Holly proposes to explore the uranium potential of the described land by drilling. This drilling will be conducted in 3 phases. Phase I for which 2 proposed plans are being submitted is to determine and partially define mineralized trends and geologic enviornments known to be favorable for the deposition of uranium minerals. Characteristics of the favorable enviornment include channel sandstones, the presence of which are inferred by outcrops along the eastern edge of the property, medium to coarse grained sand, changes in the amount of calcite cement in the sandstones, color variations, presence of pyrite and other sulphide minerals, and the most common association, carbonaceous material. Phase II will determine the extent and possible continuity of mineralization encountered and to explore the favorable geologic enviornments defined by Phase I. Phase III drilling will be used solely to define the grade and extent of mineralized areas discovered in Phases I and II.

Rotary non-core drilling will be used throughout Phase I and in Phase II where the drilling is not offsetting a mineralized hole. In Phase II when mineralized are immediately offset and throughout Phase III cores will be cut only in the mineralized zone. These cores will provide accurate smaples for chemical assay and representative samples of the rocks which make up the mineralized enviornment.

In the non-core phases cuttings will be collected continuously from the surface to the bottom of the hole and separated at 2-foot intervals.

Natural radioactivity and electric logs, SP and resistivity, will be made of each hole to check for radioactive anomalies and to aid in lithologic interpretation.

Specific proposals for each Phase are given in the following paragraphs.

Phase I To define the favorablity of the structural terrace between the Chilson anticline and the Sheep Canyon monocline 25 holes have been located on 1,500 and 2,000 foot centers. Drill line directions across the terrace will be north-south and east-west

with northwest-southeast and northeast-southwest components. Any consistent lithologic unit should be intercepted by the drilling and mapped by methods of subsurface correlation. All holes will be bottomed 10 feet below the top of the Morrison formation. Average drill hole depth across the terrace is anticipated to be 500 feet.

In addition to the 25 holes proposed across the terrace 21 holes are proposed along the upper axis of the Sheep Canyon monocline. As mentioned previously a number of deposits are present near the upper axis of the monocline approximately 6 miles north of the leased property. Thirteen of the 21 holes are placed in 2 parallel rows on either side of the projected axis. The remaining 8 holes are located across downdip portions of the monocline to provide structural data and to determine the lower axis of the monocline.

The proposed hole locations for the Phase I drilling are shown on Figure 2.

Alternate Phase I An alternate proposal to initially determine the potential of the lease block involves drilling only 22 holes. The information obtained from this alternate plan will not provide the geologist with as much detail as the more extensive Phase I, but the proposed holes will give an evaluation of the structural terrace between the Chilson anticline and the Sheep Canyon monocline and the upper axis of the monocline.

The structural terrace will be tested by 11 holes, the upper axis of the monocline by 5 holes, and the area near the lower axis of the monocline by 6 holes. (See Fig. 2 and Topo Sheets)

In addition to testing the structural features the holes form 2 east -west trending staggered fence lines which may provide enough sub-surface data to indicate the continuity of the channel snadstones seen in the outcrops along the eastern edge of the property.

Phase II Phase II drilling will trace and outline favorable sedimentary and structural features and determine the significance of mineralization encountered by Phase I drilling. The drill hole pattern and spacing for Phase II will be controlled by the particular lithologic conditions that have to be tested. Channel trends will be tested by parallel drill rows normal to the axis of the channel. Any significant mineralization encountered by Phase I drilling will be offset with a hole cored through the mineralized interval to verify the radioactive anomaly and to establish a relationship between the logs and chemical assays.

Phase III It is proposed that Phase III drilling be restricted to determining the direction and extent of mineralized trends. Coring of the mineralized horizon is recommended. Actual drill hole spacing will be determined by the trned of the mineralization and the depth to the mineralized horizon. A hole spacing of 100 and 200 foot centers is tentatively suggested.

5 (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 personsor persons who will supervise the operations.....

The Minerals Division of Holly Corporation was organized in 1954 and has since been engaged in the exploration for and mining of uranium. At the present time the Division is operating the Bucky No. 1 mine in sec. 14, T. 14 N., R. 10 W., NMPM, in the Ambrosia Lake area of New Mexico, the Mesa Top mine in sec. 20, T. 13 N., R. 9 W., NMPM and the Flat Top in sec. 30, T. 15 N., R. 9 W., NMPM both in McKinley County, New Mexico. The Division acquired and conducted the exploration work on secs. 28 and 34, T. 14 N., R. 9 W., NMPM. This property was later sold to Phillips Petroleum Corporation. The Division is also active in the mining of copper, asbestos, and mercury in Sonora, Mexico, Arizona, and Idaho respectively.

Mr. Paul E. Melancon, Chief Geologist, Holly Minerals, will direct the exploration program. Mr. Melancon has had over 8 years experience in uranium exploration. This experience includes 4 years with the U. S. Atomic Energy Commission where Mr. Melancon was district geologist at Grants, New Mexico. The Company's Mesa Top and Bucky No. 1 ore bodies were found under Mr. Melancon's supervision or direction. In addition to experience in the Grants district Mr. Melancon has been assocaited with AEC exploration projects in Utah, Arizona, and Colorado, and with Company exploration projects in Idaho, Utah, and Arizona.

The project will be under the immediate supervision of J. Thiel Sullivan, geologist. Mr. Sullivan gradurated from the University of California at Los Angeles. For the past year he has been in charge of asbestos exploration for American Fiber Corporation, a wholly owned subsidiary. Mr. Sullivan is presently supervising the Company's uranium exploration on the Helsel lease in T. 9 S., R. 3 and 4 E., BHPM, Fall River County, S. D.

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 givee the estimated total cost of the project:

(a) Independent contracts.--State the cost of any proposed independent contracts for the perfommance 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.).

Estimate of costs

Drilling Alternate Phase I
Assuming 22 holes having an average depth of 525 feet
Rotary non-core drilling

Interval	Footage	Unit Cost	Total
0-200'	4,400	$0.75	$3,300.00
200-400'	4,400	0.90	3,960.00
400-600'	2,750	1.20	3,300.00
Totals	11,550		$10,560.00

Geophysical Logging Alternate Phase I

	Footage	Unit Cost	Total
	11,550	$0.13	$1,501.50

Total cost Alternate Phase I Independent Contracts..... $12,061.50

6 (h)Total cost of the proposed project using Alternate Phase I

$61,044.28

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

224 New Customhouse
Denver 2, Colorado

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DMEA
RECEIVED MAY 29 1957

DATE	INITIALS	CODE

May 27, 1957

Memorandum

To: Secretary to the Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Application for DMEA Aid (Uranium-Vanadium) Holly Corporation (Tps. 8 and 9 S., R. 3 E., BHPM) Fall River County, South Dakota

Enclosed are the original and two copies of the subject application. One copy of the application is being forwarded to the Grand Junction Office, DMEA. One copy of the application is being retained in our file.

The Applicant proposes to drill an area believed structurally favorable to mineral deposition by 46,650 feet of exploratory drilling at a total estimated project cost of $70,942.78. A definite mineralized target area as such is not indicated to be existant.

The proposed amount of supervision appears excessive.

E. N. Harshman

E. N. Harshman
Acting Executive Officer

Answers to Questions 3 - 7b are described on the attached sheets.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

DMEA

DEPARTMENT OF THE INTERIOR
MAY 21 1957
REGION III
DENVER, COLORADO

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

Not to be filled in by applicant

Docket No. 4751
Metal or Mineral URANIUM-VANADIUM
Date Received 5-29-57
Estimated Cost $70,942.78
Participation (Government %)

RECEIVED MAY 29 1957 D.M.E.A.

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.

HOLLY CORPORATION
340 THIRD STREET N W
P. O. BOX 1509 ALBUQUERQUE, NEW MEXICO

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

.....

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

☐ Money ☐ Use of equipment owned by you ☐ Other

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 May 15, 1957

HOLLY CORPORATION
(Applicant)

By X Charles Thomas
Vice President

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

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

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

---

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:

Holly Corporation
Holly Minerals Division
340 Third Street N W
P. O. Box 1509
Albuquerque, New Mexico
Tel --- 7-1448

(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.....

A Delaware Corporation.

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

S. B. Harris, Jr.	President
Charles Chiusano	Vice President
Anton Fischer	Treasurer

all located at
Holly Corporation
Chrysler Building
405 Lexington Avenue
New York 17, N. Y.

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 29 1957
DATE | INITIALS | CODE

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.....

Holly Corporation is the lessee of the following described lands on which the proposed exploration will be undertaken:

In T. 8 S., R. 3 E., B.H.P.M., Fall River County, South Dakota
S$\frac{1}{4}$ sec. 29
SW$\frac{1}{4}$SW$\frac{1}{4}$. E$\frac{1}{2}$SW$\frac{1}{4}$, SE$\frac{1}{4}$, SE$\frac{1}{4}$NE$\frac{1}{4}$, sec.31
sec.32
W$\frac{1}{2}$, S$\frac{1}{2}$SE$\frac{1}{4}$, NW$\frac{1}{4}$SE$\frac{1}{4}$ sec.33
S$\frac{1}{2}$ sec.34
SW$\frac{1}{4}$NW$\frac{1}{4}$. NW$\frac{1}{4}$SW$\frac{1}{4}$ sec.35

In T. 9S., R. 3 E. B.H.P.M. Fall River County, South Dakota
W$\frac{1}{2}$NW$\frac{1}{4}$ sec.2
W$\frac{1}{2}$, NE$\frac{1}{4}$, W$\frac{1}{2}$SE$\frac{1}{4}$ sec.3
E$\frac{1}{2}$, N$\frac{1}{2}$NW$\frac{1}{4}$ sec.4
N$\frac{1}{2}$NW$\frac{1}{4}$ sec.5
NE$\frac{1}{4}$, N$\frac{1}{2}$NW$\frac{1}{4}$, SE$\frac{1}{4}$NW$\frac{1}{4}$, NE$\frac{1}{4}$SW$\frac{1}{4}$, S$\frac{1}{2}$SW$\frac{1}{4}$ Sec.6
NW$\frac{1}{4}$, E$\frac{1}{2}$ sec.9
W3/4 sec.10
N$\frac{1}{2}$NW$\frac{1}{4}$, NW$\frac{1}{4}$NE$\frac{1}{4}$ sec. 15
See Map

3. Applicant's property rights.--(cont'd)

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

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

(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.....
See attached Exhibits A, B, C, and D, and assignments

(e) If you own the land, describe any liens or encumbrances on it.....
Not applicable

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

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.....

No past or current mining activities on the property.

The U. S. Atomic Energy Commission completed three core drill holes to the Morrison formation to determine lithology of the Inyan Kara group. No mineralization was encountered. The holes are situated in the SW$\frac{1}{4}$SW$\frac{1}{4}$ sec. 34, T. 8 S., R. 3 E., NE$\frac{1}{4}$SW$\frac{1}{4}$ section 3, and in the NE$\frac{1}{4}$NW$\frac{1}{4}$ section 10, T. 9 S., R 3 E.

No exploration is currently being conducted on the property.

(b) State past and current production, and ore reserves, if any, giving quantities and grades.....
No past production from the property.

(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....

A complete section of the Inyan Kara group is present across the property. A westward-thickening mantle (0-250') of Skull Creek shale is present west and north of the Cheyenne River. Only the upper portion of the Fall River sandstone is exposed in the canyons along the east side of the property. Thick (75' to 100') sand sections point to possibility of paleo channels trending across the east portion. The absence of exposures across much of the acreage makes it difficult to determine channel sandstone(s) boundaries. The larger ore deposits discovered to date in the southern Black Hills occur in channel sandstones in both the Lakota and Fall River horizons. Other significant tonnages have been discovered in thick-bedded sandstones separated by shale intervals. Examination of the Atomic Energy Commission drill logs indicates the presence of moderately-thick (50'+) sandstone intervals.

4. Physical description (cont'd)

(c) cont'd.

The leased acreage straddles the southern portion of the structural terrace and steep west limb of the Sheep Canyon monocline. The upper axis of the monocline trends north-south and plunges southward, and is roughly parallel to the axis of the southward-plunging Chilson anticline. The axis of the Chilson anticline is about two miles east of the east border of the leased property. Formation dips range from 10° to 15° westward along the eastern boundary on the lower west flank of the Chilson anticline, flatten to almost horizontal across the center portion, and steepen to 7° to 12° along the west portion under the influence of the Sheep Canyon monocline. The west limit of the west limb of the monocline is not known but estimated to extend for 3/4 mile judging from exposures in the vicinity of the Holdup 15 Mine north of the leased acreage. Refer to Figures 1+2 for the geology of the property.

Clusters of small uranium ore and mineralized deposits are present in both the Lakota and Fall River formations across the dissected outcrop area east of the leased property. The deposits occur on both the east and west flanks of the assymetric Chilson anticline and also along the axis and crest of the structure. The deposits occur in thick channel-type sandstones and in alternately-bedded sandstones and shales, the mineralization confined to the sandstones. Uranium mineralization is generally secondary in occurrence exhibiting strongly-leached characteristics. It is also associated with carbonaceous matter and sometimes occurs as an unidentified black mineral disseminated throughout the sandstone.

It is plausible to assume leaching of the uranium deposits across the crest and outcrop areas and downdip movement of uranium-bearing groundwater with later reconcentration in other favorable downdip structural and lithologic environments. The structural terrace between the west limb of the Chilson anticline and the steep west limb of the Sheep Canyon monocline is considered a structurally favorable location because of its effect upon rate of movement and localization of groundwater.

To the north of the property a number of commercial uranium deposits are located on the structural terrace or near the crest of the steep limb of the Sheep Canyon monocline. The deposits occur both in channel and flood plain-type environments. The structural association may be coincidental as insufficient detailed exploration has been conducted in the area to properly support an association between the structure and the ore deposits. However, the presence of the monocline across the leased property does not distract from the favorability.

The likelihood of discovery of an ore deposit in the 10,000-ton to 20,000 ton class in the area of Fall River exposure is considered to be good, particularly if a channel sandstone is present across the property. Because the property is not dissected and subject to leaching and because of the downdip location from known mineralization, the possibility of encountering a commercial black mineral type deposit is believed to be good.

Another structural area of favorability for uranium occurrence on the property is along the lower axis of the Sheep Canyon monocline. The overburden (200'+) to an ore-bearing horizon may be such to preclude exploration for an ore deposit under 50,000 tons. The likelihood of an ore deposit to 100,000 tons in this area is possible. An ore deposit of such tonnage in the Fall River formation can be explored economically in this area. The area immediately east and northeast of Edgemont may represent a groundwater collection area due to the presence of the Sheep Canyon monocline and Cottonwood anticline. Lithologic favorability is unknown.

4. Physical description.--(cont'd)

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

The property is very accessible to transportation, residence, and supply points. U. S. Highway 85-A crosses the proposed drill area. The town of Edgemont, a community of approximately 2,000 persons, is situated immediately west of the property and is five miles from the center of the proposed drill area. A uranium mill operated by Mines Development, Inc. is located at Edgemont, and a main line of the Burlington Railroad passes through town. Hot Springs, the county seat of Fall River County and a city of 7,500 persons, is located about 20 miles east of the property.

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

All manpower required will be supplied by Holly Minerals Corporation and by the drill contractor. All necessary supplies can be obtained in the Edgemont-Hot Springs area. Power lines exist across the property. Water for drilling and mining needs can be secured from the Cheyenne River, from the city of Edgemont, or if necessary a water well can be drilled on the property.

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

The purpose of the exploration program is to discover uranium and vanadium minerals.

(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.....

Exploration drilling in three phases is proposed. The object of the initial phase is to determine the general favorability of the property. This will include, in addition to the possible discovery of uranium mineralization, lithologic characteristics that are considered criteria of favorability and serve as a guide to additional drilling. Such criteria of favorability are paleo and intraformational channel sandstones, medium to coarse-textured sandstones, marked variations of the calcium carbonate content of the sandstones, color variations, presence of iron sulphides, and the presence of carbonaceous material.

To define the favorability, 25 holes are proposed across the structural terrace to be spotted on staggered 1500-foot and 2000-foot centers. Drill line directions across the terrace will be north-south and east-west with northwest-southeast and northeast-southwest components. Any consistent lithologic trend will be intercepted and plotted by methods of subsurface correlation. All holes will bottom at the top of the Morrison formation. Average drill hole depth across the terrace is anticipated to be 500 feet. It is very probable that drilling depths during later phases will be shallower.

In addition to the 25 holes proposed across the terrace, 21 holes are proposed along the upper axis and west limb of the Sheep Canyon monocline. As mentioned previously, a number of ore deposits are present near the upper axis of the monocline approximately six miles north of the leased property. Thirteen of the 21 holes are placed in two parallel rows on both sides of the projected axis. The remaining eight holes are spotted across the downdip portions of the west limb to provide structural data and to determine the lower axis of the monocline. Refer to Figure 2 for proposed drill hole locations. Drilling depths to the Morrison formation are estimated to range from 450 feet to 600 feet in the 13 holes along the upper axis.

5. Exploration project (cont'd)

(b) cont'd.

Unless it can be shown that the uranium potential of the Lakota is such to justify its exploration, it is suggested that the bottoming depths of the remaining eight holes be limited to 600 feet.

The drill holes will be gamma-and resistivity logged by a geophysical contractor to aid in the interpretation of lithology and structure. Rotary non-core drilling is proposed for Phase I. Sample cuttings are to be collected at two-foot intervals. Lithofacie and isopachous maps, and cross-sectional diagrams will be constructed from the obtained geologic information.

Phase II drilling will consist of tracing and outlining favorable sedimentary guides and projecting and determining significance of mineralized trends discovered by Phase I exploration. The drill hole pattern and spacing will be controlled by the particular lithologic condition(s) that is to be tested in any given area. Channel trends will be tested by parallel drill rows normal to the channel. Other lithologic characteristics may be tested by drilling holes midway between two initial grid holes. Any significant mineralization encountered by Phase I drilling will be offset with a hole cored through the mineralized interval for purposes of verifying probe information and as an equilibrium check.

It is proposed that Phase III drilling be restricted to determining direction and extent of mineralized trends. Coring of the mineralized horizon is recommended. Drill hole spacing will be determined by trend of mineralization and depth of mineralized horizon below surface. A hole spacing of 200-foot centers is suggested tentatively to define the mineralized area.

(c) The work will start within 45 days and be completed within six 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.....

The Minerals Division of Holly Corporation was organized in 1954 and has since been engaged in the exploration and mining of uranium. At the present time, the division is operating Bucky #1 in sec. 14, T. 14 N., R. 10 W., Ambrosia Lake, New Mexico; the Mesa Top mine located in sec. 20 T. 13 N., R. 9 W.; the Flat Top mine located in sec. 30, T. 13 N., R. 9 W. The division acquired and conducted the mining work on secs. 28 & 34, T. 14 N., R. 9 W., and ceased to become active upon the sale of said properties to Phillips Petroleum Corporation. The division is also active in the mining of copper, asbestos, and mercury in Sonora, Mexico, Arizona, and Idaho, respectively.

Mr. William A. Carlson, geologist for the Minerals Division, will be in direct charge of the exploration program. Mr. Carlson has had approximately 5 years uranium experience with the U. S. Atomic Energy Commission and with Holly Corporation. His experience includes geologic reconnaissance and supervision of uranium drilling projects in New Mexico, Utah, Colorado, Wyoming, North Dakota, and South Dakota.

Projects under Mr. Carlson's direct control included secs. 14, 28, and 34 in the Ambrosia Lake district, and the lands comprising the proposed project were selected and acquired by him during the last six months.

The Minerals Division is under the supervision of J. G. Heaston, General Manager, P. E. Melancon, Chief Geologist, and E. B. Butts, Director of Mining.

5. Exploration project (cont'd)

(d) Cont'd.

In September, 1955, Mr. A. H. McRae joined Holly Corporation in the capacity of president of the Minerals Division. Prior to his affiliation with Holly Corporation, Mr. McRae practiced law in Albuquerque, New Mexico.

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) (a) Independent contracts.--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.).

Estimate of Costs

Drilling, Phase I

Assuming 46 holes
Rotary, Non-Core

Interval	Footage	Unit Cost	Total	
0-200'	9,200'	$0.75/Ft.	$ 6,900.00	
200-400'	9,200'	0.90/Ft.	8,280.00	
400-600'	5,650	1.20/Ft.	6,780.00	
Totals	24,050'		$21,960.00	$21,960.00

Rotary, Core

None

Drilling, Phase II

Rotary, Non-Core

Assuming 30 holes

0-200'	6,000	$0.75/Ft.	$ 4,500.00	
200-400'	6,000	0.90/Ft.	5,400.00	
400-600'	2,000	1.20/Ft.	2,400.00	
Totals	14,000'		$12,300.00	

Rotary, Core

		Av. Cost		
	100'	$4.00/Ft.	$ 400.00	
Totals	14,100'		$12,700.00	$12,700.00

6. Estimate of costs (cont'd)

Drilling, Phase III

Assuming 20 Holes

Rotary, Non-Core

Interval	Footage	Unit Cost	Total	
0-200'	3,000'	$0.75/Ft.	$ 2,250.00	
200-400'	2,500'	0.90/Ft.	2,250.00	
400-600'	1,500'	1.20/Ft.	1,800.00	
Totals	7,000'		$ 6,300.00	
Rotary, Core				
0-200'	500'	$3.00	$ 1,500.00	
200-400'	500'	4.00	2,000.00	
400-600'	500'	5.00	2,500.00	
Totals	1,500'		$ 6,000.00	
Phase III Total	8,500'		$12,300.00	$12,300.00

TOTAL DRILLING COST, PHASES I, II, III $46,960.00*

*Drilling costs are estimated. Formal bids ~~will be submitted when received~~ from drill contractors are attached.

Bulldozer Operation

Phase I

Hours	Unit Cost	Total	
24	$15.00/hr.	$ 360.00	
Phase II			
16	$15.00.hr	$ 240.00	
Phase III			
16	$15.00/hr	$ 240.00	
Totals 56 hrs.	$15.00/hr	$ 840.00	$ 840.00

Geophysical Logging Service*

Phase I

Footage	Unit Cost	Total
24,050	$0.13/Ft.	$3,126.50

*Century Geophysical Logging Corporation is the only geophysical logging contractor in the uranium field at present time.

6. Estimate of costs (cont'd)

Geophysical Logging Service (cont'd

Phase II

Footage	Unit Cost	Total	
14,100	$ 0.15/Ft.	$1,883.00	

Phase III

8,500'	$ 0.13/Ft.	$1,105.00	
Totals 46,650	$ 0.13/Ft.	$6,064.50	$ 6,064.50

Total Contract Costs, Phases I, II, AND III $53,864.50

(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.....

1 Geologist 6 months @ $675.00/mo.	$4,050.00	
1 Geological Assistant 6 months @ $300/mo.	1,800.00	
1 Surveyor 2 months @ $600/mo.	1,200.00	
1 Rodman 2 months @ $300/mo.	600.00	
1 Secretary 2 months @ $300/mo.	600.00	
TOTAL	$8,250.00	$ 8,250.00

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

Laths and Stakes	$ 50.00	
Sample Sacks	10.00	
Misc.	25.00	
TOTAL	$ 85.00	85.00

(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.....

6. Estimate of costs

(d) Cont'd.

Transit 2 mo. rental	$ 100.00	
Babbel Counters (2) Rental	50.00	
1-1955 Chevrolet ½ ton pickup Operating Cost 180 days (maximum) @ 5.00/day	900.00	
1-1952 Ford ½ ton pickup 60 days @ $5.00/day	300.00	
TOTAL	$1,350.00	$ 1,350.00

(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.....

None.

(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.....

None.

(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.....

Assaying

Phases I, II, and III

No of Samples	Unit Cost	Total
200*	$ 5.00	$1,000.00

Equipment Repairs

$25.00/mo for 6 months	$ 150.00

Accounting

$100.00/mo for 6 months	$ 600.00

*Every fifth sample will be assayed for vanadium oxide and calcium carbonate content.

6. Estimate of costs

(g) Miscellaneous (cont'd)

Workmen's Compensation and Insurance

Note: In computing the following insurance and payroll tax costs an average monthly payroll of $1,375.00 was used.

Workmen's Compensation

Rate	Total Cost
2.32%	$ 192.00

Employer's Liability

Rate	Total Cost
0.022%	$ 78.15

Unemployment Insurance

Rate	Total Cost
3.00%	$ 247.50

Payroll Taxes

Rate	Total Cost
2.25%	$ 185.63

TOTAL	$ 2,393.28	$ 2,393.28

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

Contingencies	$ 5,000.00	$ 5,000.00

Total cost of proposed project, Phases I, II, and III $70,942.78

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

(b) How do you propose to furnish your share of the costs?.....
By ....Money.

It is proposed that the Defense Minerals Exploration Administration pay the Minerals Division of Holly Corporation 75 per cent of the cost of the above exploration program. Holly Corporation will pay the current expenses of the project and invoice the DMEA on the 20th of each month for the work done the preceding month. It is proposed that instead of charging the estimated monthly rate for repairs, etc., the items be invoiced in the month in which they are made.

A report, map, and assay results will be submitted along with the invoice to show the progress made during the previous month.

PHONE GIBSON 7-8847

B. C. COUCH DRILLING CO.

JENKINS BUILDING 515 SO. MAIN

TULSA, OKLAHOMA

May 1, 1957
Teton Hotel
Riverton, Wyoming

Holly Minerals Corp.
Box 1509
Albuquerque, New Mexico

Attn: Mr. Paul E. Melancon

Dear Mr. Melancon:

I would like to submit the following bid on the proposed drilling program just east of Edgemont, South Dakota.

For 20,000 feet
0' - 200' @ $0.70 per foot
200' - 400' @ $0.80 per foot
400' - 650' @ $0.95 per foot

For 20,000 feet to 50,000 feet
0' - 200' @ $0.65 per foot
200' - 400' @ $0.75 per foot
400' - 650' @ $0.90 per foot

Over 50,000 feet
0' - 200' @ $0.60 per foot
200' - 400' @ $0.70 per foot
400' - 650' @ $0.90 per foot

Standby time at $10.00 per hour.

I would give an estimate of $4.00 per foot on coring.

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DMEA
RECEIVED MAY 29 1957

DATE	INITIALS	CODE

Very truly yours,

B.C. Couch Drilling Co.

B. C. Couch

B.C. Couch

BCC/ip

GEM

STEWART BROS. & PARKER DRILLING COMPANY

EXPLORATION DRILLING CONTRACTORS

P. O. BOX ~~24X9~~ 154 PHONE ~~6X6143~~ AT7-4416

~~ODESSA, TEXAS~~

Grants, New Mexico

April 30, 1957

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DATE	INITIALS	CODE

Mr. Paul E. Melancon, Chief Geologist
Holly Minerals Corporation
P. O. Box 1509
Albuquerque, New Mexico

Dear Paul:

In response to your request for bids on your proposed drilling program near Edgemont, South Dakota, we submit the following:

MINIMUM CONTRACT of 20,000 FEET

Plug Drilling, 0 to 300 feet @	75¢	per foot
" " 301 to 500 feet @	95¢	per foot
" " 501 to 700 feet @	$1.15	per foot
Diamond Core 5,000 ft. maximum @	$4.50	per foot

CONTRACT OF 20,000 feet to 50,000 feet

Plug Drilling, 0 to 300 feet @	70¢	per foot
" " 301 to 500 feet @	90¢	per foot
" " 501 to 700 feet @	$1.10	per foot
Diamond Core 5,000 ft. Maximum @	$4.00	per foot

CONTRACT OVER 50,000 feet

Plug Drilling, 0 to 300 feet @	65¢	per foot
" " 301 to 500 feet @	85¢	per foot
" " 501 to 700 feet @	$1.05	per foot
Diamond Core 5,000 ft. Maximum @	$3.75	per foot

STANDBY TIME @ $15.00 per hour on either contract.

If any questions arise concerning this bid, do not hesitate to contact us.

Very truly yours,
STEWART BROS. & PARKER DRILLING CO.

By H M Stewart
H. M. Stewart, Partner

W. T. Myers Drilling Company

SHOT HOLE AND CORE DRILLING

PHONE 6-4511

2113 WISCONSIN, NE

ALBUQUERQUE, NEW MEXICO

May 3, 1957

Holly Minerals Corporation
P. O. Box 1509
Albuquerque, New Mexico

I submit the following bid on yourSouth Dakota properties:

20,000 Ft. Contract
$ 0.75 per ft. to 200 Ft.
$ 0.95 " " " 400 Ft.
$ 1.15 " " " 600 Ft.
Cores in this bracket will be $ 3.50 Per Ft.

20,000 Ft to 50,000 Ft.
$ 0.70 Per ft. to 200 Ft.
$ 0.90 " " " 400 Ft.
$ 1.10 " " " 600 Ft.
Cores Same As Above.

Over 50,000 Ft.
$ 0.65 Per Ft. to 200 Ft.
$ 0.85 " " " 400 Ft.
~~$ 0.~~
$ 1.05 Per Ft. to 600 Ft.
Cores Same As Above.

Standby time $ 10.00 Per Hr.

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Very truly yours,

W. T. Myers

W. T. Myers

ELECTRIC AND GAMMA LOGGING
AND INTERPRETATIONS

MANUFACTURING
& SALES

GEOLOGICAL AND GEOPHYSICAL
MINING SURVEYS

SEISMIC
SURVEYS

Century Geophysical Corporation

LOGGING AND URANIUM DIVISION
312 Uranium Center
GRAND JUNCTION, COLORADO
CHapel 3-1183

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DATE	INITIALS	CODE

May 16, 1957

Mr. Wm. Carlson
Holly Uranium
340 Third St. N.W.
Albuquerque, New Mexico

Dear Mr. Carlson:

This letter is set forth for the purpose of outlining Century Geophysical's logging services and their respective charges. It has been stated that on or about June 15, 1957 Holly Uranium anticipates a two rig drilling program near Edgemont, South Dakota.

Attached is a schedule of charges for our services. You will note that for the basic Simultaneous Gamma - Ray - Resistivity log the monthly charge is $2,950.00 for a 200 to 230 hour month based on a 48 hour week, or proportionately for any part of a month worked. Secondly that drive time to and from the project area as well as drive time from crew headquarters to the project will be considered as working time. It is anticipated that on commencement of the operation one of our units now operating in Riverton, Wyoming would be dispatched for this project. Therefore drive time would be from Riverton, Wyoming to Edgemont, South Dakota. Thirdly that overtime per month will be charged at 120% of the basic rate.

Charges for additional logging, technical services and extra equipment are covered in paragraphs 3, 4, 5 and 6 of the accompanying schedule of charges. Any one of the latter services and/or equipment may be obtained at the client's request on a hourly, daily, weekly or monthly basis during the term of the contract.

Holly has further pointed out the possibility of another company's drilling program on an adjacent property. Since the size of your drilling operation would not demand the full time of our logging operator and unit, we therefore would be willing to include the logging of holes on the adjacent property at no additional charge other than the monthly rates mentioned above. Further the logging information from your project or the one on the adjoining property would be presented solely to the party on whose property the work was done. Thirdly we would carry separate monthly statistical reports covering the hours of logging and drive time. The charges to each client would be calculated

ELECTRIC AND GAMMA LOGGING
AND INTERPRETATIONS

MANUFACTURING
& SALES

GEOLOGICAL AND GEOPHYSICAL
MINING SURVEYS

SEISMIC
SURVEYS

Century Geophysical Corporation

LOGGING AND URANIUM DIVISION
312 Uranium Center
GRAND JUNCTION, COLORADO
CHapel 3-1183

on a proportionate basis according to the number of hours worked for each client.

Should you desire any further information pertaining to our services or if there is any questions on our schedule of charges please do not hesitate to contact us regarding these matters.

Yours truly

A. J. Nicol/sd

A. J. Nicol
Manager - Logging & Uranium Division

AJN/sd
cc: J. E. Roberts
Tulsa office
Encls: 4

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CENTURY GEOPHYSICAL CORPORATION
Logging and Uranium Division

312 Uranium Center Grand Junction, Colo.

Tulsa, Oklahoma Office
5th Floor Jenkins Bldg.
Phone: CHerry 2-8121

Grants, New Mexico Office
Box 387
Phone: ATwater 7-4779

The following is a price schedule for the Century Geophysical Corporation Logging Services, Mining and Interpretation Surveys; all logging charges are for holes to a maximum of 2500 feet in depth:

1. Basic Logging of Simultaneous Gamma Ray - Resistance Curves:

Hourly	Daily	Weekly	Monthly
$16.00 plus 4¢ per foot.	$160.00 — 10 hour day maximum plus 4¢ per foot.	$850.00 for a 48 hour maximum.	$2,950.00 for a 48 hour week

Standby and Drive Time

$10.00 per hour.	$10.00 per hour.	Drive time to and from Grand Junction, Colo., or base of operations to the project on commencement and completion and standby at client's request will be considered as working time.

Overtime Charges

None	None	120% of Basic Rate

SEE SCHEDULES 'A' AND 'B' FOR AMBROSIA LAKE AREA PRICES.

2. General Terms:

(a) No charge will be made for lost time due to equipment failure.
(b) Century will not be responsible for extra drilling charges necessitated by (1) the caving or collapse of an exploration hole, (2) when a probe is lost in a hole prior to or during the logging of that hole.
(c) The client will expend a normal amount of time, equipment and effort in attempting to recover any lost probes. Time spent by Century personnel in an attempt to recover a lost probe will be considered as working time.
(d) All footage charges stated above and below are considered from the surface to the maximum depth obtained, plus any necessary rerun section of that hole.
(e) Century will carry adequate Workmen's Compensation and/or Employer's Liability, Automobile Public Liability and Comprehensive Public Liability Insurance.
(f) Century, its agents and employees shall zealously guard all information, logs, maps and data sheets in order to prevent anyone from in any manner obtaining or acquiring information with reference to the survey that may be made by Century.
(g) Towing Charges: A reasonable attempt will be made to get from the highway to the location and back again under our own power of the 4-wheel drive equipment. If caterpillar or other pulling equipment is required, same will be provided by client at his expense. If client does not provide pulling equipment when necessary, Century will hire pulling equipment and bill client for the actual cost.

If the above meets with your approval, please sign in the space provided below.

CENTURY GEOPHYSICAL CORPORATION

By_____

By_____

ACCEPTED AND APPROVED THIS

_____DAY OF_____195____.

_____

By_____
Title

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AMBROSIA LAKE AREA PRICES

SCHEDULE 'A'

AMBROSIA LAKE AREA (within 9 mile radius)

GAMMA-RESISTANCE CURVE $0.075 per foot.

Price schedules for areas beyond the limits of Ambrosia Lake Area (nine mile radius) of center of Township 14 North, Range 10 West:

1. Within twenty mile radius of center of Township 14 North, Range 10 West, GAMMA-RESISTANCE CURVE $0.10 per foot.

2. Within thirty-five mile radius of center of Township 14 North, Range 10 West, GAMMA-RESISTANCE CURVE $0.12 per foot.

3. Within fifty mile radius of center of Township 14 North, Range 10 West, GAMMA-RESISTANCE CURVE $0.15 per foot

4. Standard prices for additional services will prevail.

SCHEDULE 'B'

In addition to the aforementioned curves the client can, if desired, obtain for all Ambrosia Lake areas the following services at the rates given below:

(1) Self Potential Curve at a charge of $0.015 (1-1/2¢) per foot.

(2) Caliper Curve - $0.05 (5¢) per foot with a minimum charge of $25.00 per hole.

(3) Drift measurement to show magnitude and direction of hole drift at a service charge of $20.00 per hole plus $10.00 per shot.

(4) Physical property measurement of the bore hole fluid which will include density, viscosity, salinity and resistivity at a charge of $5.00 per hole.

= + = = + = = + = = + =

Prices subject to change without notice.

L E A S E A N D

THIS LEASE AND AGREEMENT, Made

day of March, 1957, by and between

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D N E A
RECEIVED MAY 29 1957

DATE	INITIALS	CODE

these presents do hereby lease, let and demise unto the Lessee the exclusive right to enter upon the above described premises, for the purpose of removing any and all minerals thereon or therein, and all mineral substances, erecting buildings to be used in connection therewith, installing machinery, sinking shafts, drilling and using any and all methods known to the science of mining, processing or otherwise preparing for market said minerals, and the transporting

and selling of said minerals.

Lessee specifically agrees that in the event of the termination of this lease and agreement by default on his part, or at his option, that said Lessee will execute and deliver to the Lessors a release of this agreement.

The term of this lease shall be one (1) year for which the Lessee shall pay a consideration of 60¢ per acre, with an option to renew for a second year upon payment of a cash rental of $1.00 per acre, and said lease shall extend thereafter as long as either mining or exploration, drilling or development, or other mineral activities connected therewith continue with reasonable diligence on said premises. And the Lessee agrees to pay to the Lessors for and during the full term of this lease and agreement, a royalty of 10% on any and all ores produced and sold from said premises, including bonus and grade premiums, but exclusive of haulage and development allowances; it being understood and agreed by the parties hereto that sale shall mean sale or transfer of raw ores to any person, firm or corporation for milling purposes, price to be based on A. E. C. Circular 5. Rental fees shall be discontinued after the payment for the second 12 months period. All royalty payments shall be made within thirty (30) days after receipt of payment for any ores sold by the Lessee.

Lessee agrees that he shall not trespass on farm ground until crops are removed. It is specifically understood and agreed by and between the Lessors and the Lessee that if the property herein leased is sold during the term of this lease, it shall be sold subject to this lease.

It is further agreed that in the event of the termination of this lease the Lessee shall have a period of thirty (30) days after such termination to remove any and all equipment, machinery, buildings or other property of every nature which may belong to the Lessee.

Lessee covenants that he shall be responsible for any and all labor performed, Workmen's Compensation insurance, and all liability of every kind and character connected with the mining operations on the leased premises.

Lessee further agrees to comply with all applicable State or Federal Laws and regulations relative to employment, Workmen's Compensation, Social Security and Forest Service regulations relative to his operations on the leased premises, and to save the Lessors harmless at all times from his operations.

It is further agreed by and between the parties hereto that the Lessee will furnish copies of all mill liquidation and settlement sheets to the Lessors.

Lessee further agrees to repair any and all damage that might occur to surface installations arising out of his mining operations.

Lessors agree to permit construction by bulldozer of drill sites and access roads to drill sites that may be necessary.

Lessee will furnish Lessors with progress reports and maps of the exploration program as conducted.

It is understood and agreed by and between the Lessors and the Lessee that this lease and agreement shall not be assigned without written consent of the Lessors; however, lessors will not unreasonably withhold such consent.

It is specifically understood and agreed by and between the parties hereto that this agreement is binding upon and shall inure to the benefit of the parties hereto, their heirs, successors, administrators and assigns.

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

John M. Koller

Rosa M. Koller

LESSORS

H. A. Carlson

LESSEE

LEASE AND AGREEMENT
KOLLER - CARLSON

STATE OF SOUTH DAKOTA)
SS.
COUNTY OF FALL RIVER)

On this the 20th day of March, 1957, before me, the undersigned Notary Public within and for said County and State, personally appeared John M. Koller, Rosa Koller and W. A. Carlson, known to me to be the persons whose names are subscribed to the within and foregoing instrument and acknowledged to me that they executed the same.

Pauline Russell
Notary Public

My commission expires 1-8-61.

A S S I G N M E N T

The undersigned W. A. Carlson hereby sets over, transfers, and assigns to the Holly Corporation all of his right, title and interest in and to that certain lease dated March 20, 1957 wherein John M. Koller and Rosa Koller are Lessors and the undersigned is Lessee, which said lease covers the following described real estate situated in the County of Fall River, State of South Dakota

S 1/2 Sec. 34
N W 1/4 S W 1/4 and S W 1/4 N W 1/4 Sec. 35
in T. 8 S., R. 3 E. B.H.P.M.
and
W 1/2 N W 1/4 Sec. 2
E 1/2 W 1/2, W 1/2 E 1/2, E 1/2 N E 1/4 Sec. 3
in T. 9 S., R. 3 E. B.H.P.M.

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D M E A
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A N D

The undersigned further acknowledges that he had at no time any beneficial interest in said lease and that the same was executed for the benefit of the assignee herein.

W. A. Carlson

STATE OF New Mexico)
COUNTY OF Bernalillo) SS.

On this the 6th day of May, 1957, before me, the undersigned Notary Public within and for said County and State, personally appeared W. A. Carlson known to me to be the person whose name is subscribed to the within and foregoing instrument and acknowledged to me that he executed the same.

G Burns
Notary Public

My commission expires
My commission expires June 8, 1960

EXHIBIT 6

LEASE AND AGREEMENT

THIS LEASE AND AGREEMENT, made and entered into this 8th day of March, 1957, by and between WILLIAM ERSCHEN and MARY ERSCHEN, husband and wife, and PHILIP ERSCHEN, hereinafter referred to as Lessors, and A. H. McRAE, of 340 Third Street, N. W., Albuquerque, New Mexico, hereinafter referred to as Lessee.

WITNESSETH:

WHEREAS, the Lessors are the owners of the following described deeded lands and premises, to-wit:

Properties in the name of William Erschen:

N½NW¼ of Sec. 3
NE¼ & N½NW¼ of Sec. 4
N½NW¼ of Sec. 5
NE¼, N½NW¼, SE¼NW¼, E½SW¼ & SW¼SW¼ of Sec. 6
All in Township 9 South, Range 3 East B. H. M.

SE¼, S½SW¼, NE¼SW¼ & SE¼NE¼ of Sec. 31
S½ & S½NW¼ of Sec. 32
S½S½ of Sec. 33
All in Township 8 South, Range 3 East B. H. M.
The above comprising 1680 acres more or less;

Properties in the name of Philip Erschen:

W½SW¼ of Sec. 3
SE¼ of Sec. 4
N½ & SE¼ of Sec. 9
S½W½ of Sec. 10
NW¼NW¼ of Sec. 15
All in Township 9 South, Range 3 East B. H. M.
The above comprising 920 acres more or less;

All of said above described property being in Fall River County, South Dakota;

AND

WHEREAS, the Lessee is interested in securing the entire and exclusive right to mine, prepare for market and sell any and all minerals and mineral substances of every kind therein or thereon, except gas and oil,

NOW, THEREFORE, for values mutually exchanged, the receipt and sufficiency whereof is hereby acknowledged, and the covenants and agreements to be kept and performed by the Lessee as more particularly stated and set out below, the Lessors have leased, and by these presents do hereby lease, let and demise unto the Lessee the exclusive right to enter upon the above described premises, for the purpose of removing any and all minerals therein or thereon,

and mineral substances, erecting buildings to be used in connection therewith, installing machinery, sinking shafts, drilling and using any and all methods known to the science of mining, processing or otherwise preparing said minerals for market, and the transporting and selling of said minerals.

Lessee specifically agrees that in the event of the termination of this lease and agreement by default on the part of the Lessee, or at the option of the Lessee, that said Lessee will execute and deliver to the Lessors a release of this instrument.

The term of this lease shall be two (2) years and as long thereafter as either mining or exploration, drilling or development, or other mineral activities connected therewith continues with reasonable diligence on said premises. And as consideration for this lease, the Lessee agrees to pay for the first twelve month period a rental of $1,300.00; and at the end of this twelve month period, if property is to be retained for another twelve months the Lessee shall make a payment of $1.00 per acre for all acreage described herein in which Lessors own all the minerals; and the Lessee agrees to pay to the Lessors for and during the term of this lease and agreement, a royalty of 10% on any and all ores produced and sold from said premises, including bonus and grade premium, but exclusive of haulage and development allowances; it being understood and agreed by the parties hereto that sale shall mean sale or transfer of raw ores to any person, firm or corporation for milling purposes, price to be based on A. E. C. Circular 5. Rental fees shall be discontinued after the payment of the rental for the second 12 months period. All royalty payments under this lease shall be made within thirty (30) days after receipt of payment for any ores sold.

It is agreed that in the event of termination of this lease and agreement, the Lessee shall have a period of thirty (30) days

LEASE AND AGREEMENT
ERSCHEN - McRAE

Mary Erschen
Philip Erschen
LESSORS

A H McRae
LESSEE

STATE OF SOUTH DAKOTA)
SS.
COUNTY OF FALL RIVER)

On this the 8th day of March, 1957, before me, the undersigned Notary Public within and for said County and State, personally appeared William Erschen, Mary Erschen, Philip Erschen and A. H. McRae, known to me to be the persons whose names are subscribed to the within and foregoing instrument and acknowledged to me that they executed the same.

Percel Rumsey
NOTARY PUBLIC

My commission expires 1-8-61.

CENTRAL FILE COPY
F M E A
RECEIVED MAY 29 1957

DATE	INITIALS	CODE

A S S I G N M E N T

The undersigned A. H. McRae hereby sets over, transfers, and assigns to the Holly Corporation all of his right, title and interest in and to that certain lease dated March 8, 1957 wherein William Erschen and Mary Erschen and Philip Erschen are Lessors and the undersigned is Lessee, which said lease covers the following described real estate situated in the County of Fall River, State of South Dakota

W 1/2 N W 1/4 Sec. 3
W 1/2 S W 1/4 Sec.3
N E 1/4 and N 1/2 N W 1/4 Sec. 4
S E 1/4 Sec. 4
N 1/2 NW 1/4 Sec. 5
N E 1/4, N 1/2 N W 1/4, S E 1/4 N W 1/4, E 1/2 S W 1/4, and S W 1/4 S W 1/4 Sec. 6
N 1/2 and S E 1/4 Sec. 9
W 1/2 W 1/2 Sec. 10
N W 1/4 N W 1/4 Sec. 15
in T. 9 S., R. 3 E. B.H.P.M.
and
S E 1/4, S 1/2 S W 1/4, N E 1/4 S W 1/4, and S E 1/4 N E 1/4 Sec. 31.
S 1/2, and S 1/2 N W 1/4 Sec. 32
S 1/2 S 1/2, Sec. 33
in T. 8 S., R. 3 E., B.H.P.M.

OFFICIAL FILE COPY
D M E A
RECEIVED MAY 29 1957

DATE	INITIALS	CODE

A N D

The undersigned further acknowledges that he had at no time any beneficial interest in said lease and that the same was executed for the benefit of the assignee herein.

A H McRae

STATE OF New mexico)
COUNTY OF Bernalillo) SS.

On this the 6th day of May, 1957, before me, the undersigned Notary Public within and for said County and State, personally appeared A. H. McRae known to me to be the person whose name is subscribed to the within and foregoing instrument and acknowledged to me that he executed the same.

R. J. Burns
Notary Public

My commission expires

My commission expires June 8, 1960

after such termination to remove any and all equipment, machinery, buildings or other property of every nature which may belong to the Lessee.

Lessee covenants and agrees that he is responsible for all labor performed, Workmen's Compensation, and all liability of every kind and character connected with the mining operations on the leased premises.

Lessee further agrees to comply with all applicable State or Federal Laws and regulations relative to employment, Workmen's Compensation, Social Security and Forest Service regulations arising out of ~~their~~ his operations, and to save the Lessors harmless at all times from such operations.

It is further understood and agreed by and between the parties hereto that the Lessee will furnish copies of all mill liquidations and settlement sheets to the Lessors.

Lessees further agree to repair any and all damage that might occur to surface installations arising out of their mining operations.

Lessors agree to permit construction by bull-dozer of drill sites and access roads to drill sites that may be necessary.

Lessee will furnish Lessors with progress reports and maps of the conducted exploration program.

It is understood and agreed that any rentals and royalties paid under this contract shall be made to William Erschen as agent for the Lessors herein.

It is specifically understood andagreed by and between the parties hereto that this agreement is binding upon and shall inure to the benefit of the parties hereto, their heirs, successors, administrators and assigns.

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

William P. Erschen

EXHIBIT B

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 29 1957
DATE | INITIALS | CODE

L E A S E A N D A G R E E M E N T

THIS LEASE AND AGREEMENT, Made and entered into this 15th day of March, 1957, by and between B. H. Lord and Amy Lord, husband and wife, of Edgemont, South Dakota, hereinafter referred to as the Lessors, and W. A. Carlson, of 340 Third Street, N. W., Albuquerque, New Mexico, hereinafter referred to as the Lessee.

WITNESSETH:

WHEREAS, the Lessors are the owners of the following described deeded lands and premises, to-wit:

Fall River County, South Dakota :

Sec. 10, T. 9, R. 3, E. B. H. M.: E½NW¼, W½NE¼, E½SW¼ & W½SE¼

Sec. 15, T. 9, R. 3, E.B. H. M. : NE¼NW¼ & NW¼NE¼

consisting of approximately 400 acres more or less;

A N D

WHEREAS, the Lessee is interested in securing the entire and exclusive right to mine, prepare for market, and sell any and all minerals and mineral substances of every kind therein or thereon, except gas and oil,

NOW, THEREFORE, for values mutually exchanged, the receipt and sufficiency whereof is hereby acknowledged, and the covenants and agreements to be kept and performed by the Lessee as more particularly stated and set out below, the Lessors have leased, and by these presents do hereby lease, let and demise unto the Lessee the exclusive right to enter upon the above described premises, for the purpose of removing any and all minerals thereon or therein, and mineral substances, erecting buildings to be used in connection therewith, installing machinery, sinking shafts, drilling and using any and all methods known to the science of mining, processing or otherwise preparing said minerals for market, and the transporting and selling of said minerals.

Lessee specifically agrees that in the event of the termination of this lease and agreement by default on the part of the Lessee, or at the option of the Lessee, that said Lessee will execute and

deliver to the Lessors a release of this agreement.

The term of this lease shall be one year for which the Lessee shall pay a consideration of 50¢ per acre, with option to renew for a second year upon payment of a cash rental of $1.00 per acre, and said lease shall extend thereafter as long as either mining or exploration, drilling or development, or other mineral activities connected therewith continue with reasonable diligence on said premises. And the Lessee agrees to pay to the Lessors for and during the full term of this lease and agreement, a royalty of 10% on any and all ores produced and sold from said premises, including bonus and grade premium, but exclusive of haulage and development allowances; it being understand and agreed by the parties hereto that sale shall mean sale or transfer of raw ores to any person, firm or corporation for milling purposes, price to be based on A. E. C. Circular 5. Rental fees shall be discontinued after the payment for the second 12 months period. All royalty payments shall be made within thirty (30) days after receipt of payment for any ores sold by the Lessee.

The Lessee agrees to do a minimum amount of drilling of 6 holes to the Morrison formation at least, during the first year of this lease, and a minimum of 6 holes to the Morrison formation at least, during the second year of this lease.

The Lessee agrees that he shall not trespass on farm ground until crops are removed. It is specifically understood and agreed by and between the Lessors and the Lessee that if the property herein leased is sold during the term of this lease, it shall be sold subject to this lease.

It is further agreed that in the event of the termination of this lease, the Lessee shall have a period of thirty (30) days after such termination to remove any and all equipment, machinery buildings or other property of every nature which may belong to the Lessee.

Lessee covenants that he shall be responsible for any and all labor performed, Workmen's Compensation, and all liability of

every kind and character connected with the mining operations on the leased premises.

Lessee further agrees to comply with all applicable State or Federal Laws and regulations relative to employment, Workmen's Compensation, Social Security and Forest Service Regulations relative to his operations, and to save the Lessors harmless at all times from such operations.

It is further understood and agreed by and between the parties hereto that the Lessee will furnish copies of all mill liquidation and settlement sheets to the lessors.

Lessees further agree to repair any and all damage that might occur to surface installations arising out of his mining operation s.

Lessors agree to permit construction by bull-dozer of drill sites and access roads to drill sites that may be necessary.

Lessee will furnish Lessors with progress reports and maps of the exploration program as conducted.

It is understood and agreed by and between the Lessors and the Lessee that this lease and agreement shall not be assigned without written consent of the Lessors; however, Lessors will not unreasonably withhold such consent.

It is specifically understood and agreed by and between the parties hereto that this agreement is binding upon and shall inure to the benefit of the parties hereto, their heirs, sucdessors, administrators and/or assigns.

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

B N Lord

Avery Lord
LESSORS

H. A. Carlson
LESSEE

STATE OF SOUTH DAKOTA)
SS.
COUNTY OF FALL RIVER)

On this the 15th day of March, 1957, before me, the

undersigned Notary Public within and for said County and State, personally appeared B. H. Lord, Amy Lord and W. A. Carlson, known to me to be the persons whose names are subscribed to the within and foregoing instrument and acknowledged to me that they executed the same.

Pauline H. Russell
Notary Public

My commission expires 1-8-61.

A S S I G N M E N T

The undersigned W. A. Carlson hereby sets over, transfers, and assigns to the Holly Corporation all of his right, title and interest in and to that certain lease dated March 15, 1957 wherein B. H. Lord and Amy Lord are Lessors and the undersigned is Lessee, which said lease covers the following described real estate situated in the County of Fall River, State of South Dakota

E 1/2 N W 1/4, W 1/2 N E 1/4, E 1/2 S W 1/4, and W 1/2 S E 1/4 Sec. 10
N E 1/4 N W 1/4 and N W 1/4 N E 1/4 Sec. 15
in T. 9 S., R. 3 E., B.H.P.M.

OFFICIAL FILE COPY
D M E A
RECEIVED MAY 29 1957

DATE	INITIALS	CODE

A N D

The undersigned further acknowledges that he had at no time any beneficial interest in said lease and that the same was executed for the benefit of the assignee herein.

W. A. Carlson

STATE OF New Mexico)
COUNTY OF Bernalillo) SS.

On this the 6th day of May, 1957, before me, the undersigned Notary Public within and for said County and State, personally appeared W. A. Carlson known to me to be the person whose name is subscribed to the within and foregoing instrument and acknowledged to me that he executed the same.

R. H. Burns
Notary Public

My commission expires
My commission expires June 8, 1960

EXHIBIT "

L E A S E A N D A G R E E M E N T

THIS LEASE AND AGREEMENT, Made and entered into this 27th day of March, 1957, by and between Albert Nelson and Carrie Nelson, husband and wife, of Hot Springs, Fall River County, South Dakota, hereinafter referred to as the Lessors, and W. A. Carlson of 340 Third Street N. W., Albuquerque, New Mexico, hereinafter referred to as the Lessee.

W I T N E S S E T H :

WHEREAS, the Lessors are the owners of the following described deeded lands and premises, to-wit:

In Fall River County, South Dakota, Township 8 S., Range 3 East B. H. M.:

Sec. 29: S½S½
Sec. 32: N½NW¼ & NE¼
Sec. 33: NW¼, N½SW¼ & NW¼SE¼

consisting of 680 acres more or less;

A N D

WHEREAS, the Lessee is interested in securing the entire and exclusive right to mine, prepare for market and sell any and all minerals and mineral substances of every kind therein or thereon, except gas and oil,

NOW, THEREFORE, for values mutually exchanged, the receipt and sufficiency whereof is hereby acknowledged, and the covenants and agreements to be kept and performed by the Lessee as more particularly stated and set out below, the Lessors have leased, and by these presents do hereby lease, let and demise unto the Lessee the exclusive right to enter upon the above described premises, for the purpose of removing any and all minerals thereon or therein, and all mineral substances, erecting buildings to be used in connection therewith, installing machinery, sinking shafts, drilling and using any and all methods known to the science of mining, precedsing or otherwise preparing for market said minerals, and the transporting and selling of said minerals.

Lessee specifically agrees that in the event of the termination of this lease and agreement by default on his part, or at his option, that said Lessee will execute and deliver to the Lessors a release of this agreement.

The term of this lease shall be one (1) year for whi ch the Lessee shall pay a consideration of 50¢ per acre, with an option to renew for a second year upon payment of a cash rental of $1.00 per acre, and said lease shall extend thereafter as long as either mining or exploration, drilling or development, or other mineral activities connected therewith continue with reasonable diligence on said premises. And the Lessee agrees to pay to the Lessors for and during the term of this lease and agreement, a royalty of 10% on any and all ores produced and sold from said premises, including bonus and grade premiums, but exclusive of haulage and development allowances; it being understood and agreed by the parties hereto that sale shall mean sale or transfer of raw ores to any person, firm or corporation for milling purposes, price to be based on A. E. C. Circular 5. Rental fees shall be discontinued after the payment for the second 12 months period. All royalty payments shall be made within thirty (30) days after receipt of payment for any ores sold by the Lessee.

Lessee agrees that he shall not trespass on farm ground until crops are removed. It is specifically understood and agreed herein by and between the Lessors and the Lessee that if the property is sold during the term of this lease and agreement, it shall be sold subject to this lease.

It is further understood and agreed that in the event of the termination of this lease the Lessee shall have a period of thirty (30) days after such termination to remove any and all equipment,

machinery, buildings and any and all other property of every nature which may belong to the Lessee.

Lessee covenants and agrees that he shall be responsible for any and all labor performed, Workmen's Compensation, and all liability of every kind and character connected with the mining operations on the leased premises.

Lessee further agrees to comply with all applicable State or Federal Laws and regulations relative to employment, Workmen's Compensation, Social Security and Federal Forest Service regulations relative to his operations on the leased premises, and to save the Lessors harmless at all times from his operations.

It is further agreed by and between the parties hereto that the Lessee will furnish copies of all mill liquidation and settlement sheets to the Lessors.

It is understood and agreed by and between the parties hereto that the Lessee shall repair any and all damage that might occur to surface installations arising out of his mining operations.

Lessors agree to permit construction by bulldozer of drill sites and access roads to drill sites that may be necessary.

Lessee will furnish Lessors with progress reports and maps of the exploration program as conducted.

It is specifically understood and agreed by and between the parties hereto that this agreement is binding upon and shall inure to the benefit of the parties hereto, their heirs, successors, administrators and assigns.

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

Albert Nelson

Carrie V Nelson

LESSORS

H. A. Carlson

LESSEE

LEASE AND AGREEMENT
Nelson - Carlson

STATE OF SOUTH DAKOTA)
SS.
COUNTY OF FALL RIVER)

On this the 27 day of March, 1957, before me, the undersigned Notary Public within and for said County and State, personally appeared Albert Nelson, Carrie Nelson and W. A. Carlson, known to me to be the persons whose names are subscribedto the within and foregoing instrument and acknowledged to me that they executed the same.

Paul H. Jensen
Notary Public

My commission expires 1-8-61.

A S S I G N M E N T

The undersigned W. A. Carlson hereby sets over, transfers, and assigns to the Holly Corporation all of his right, title and interest in and to that certain lease dated March 27, 1957 wherein Albert Nelson and Carrie Nelson are Lessors and the undersigned is Lessee, which said lease covers the following described real estate situated in the County of Fall River, State of South Dakota

S 1/2 S 1/2 Sec. 29
N 1/2 N W 1/4 and N E 1/4 Sec. 32
N W 1/4, N 1/2 S W 1/4 and N W 1/4 S E 1/4 Sec. 33
in T. 8 S., R. 3 E. B.H.P.M.

OFFICIAL FILE COPY
D M E A
RECEIVED MAY 29 1957

DATE	INITIALS	CODE

A N D

The undersigned further acknowledges that he had at no time any beneficial interest in said lease and that the same was executed for the benefit of the assignee herein.

W. A. Carlson

STATE OF New Mexico)
COUNTY OF Bernalillo) SS.

On this the 6th day of May, 1957, before me, the undersigned Notary Public within and for said County and State, personally appeared W. A. Carlson known to me to be the person whose name is subscribed to the within and foregoing instrument and acknowledged to me that he executed the same.

Rd Burns
Notary Public

My commission expires
My commission expires June 8, 1960

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
8/7	Knouse	700
"	Ellis	700
8/9	Martin	130
"	Johnson	110
	Mittendorf	109
8/12	O.K.	220
		225
8/9	Yoss	130
8/9	Nelson	130

AUG - 9 1957

Mr. Charles Chiusano
Vice President
Holly Corporation
340 Third Street, N. W.
P. O. Box 1509
Albuquerque, New Mexico

Re: Docket No. DMEA-4751 (Uranium)
Land in Tps. 8 and 9 S.,
R. 3 E., B.H.B.& M.
Fall River County, South Dakota

Dear Mr. Chiusano:

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

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

Careful study of all our information indicates 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. Such denial, however, is made without prejudice to the property. If future work on your property reveals evidence which could materially alter this opinion, be assured we will be pleased to consider a new application.

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 (for)
Administrator

FLKnouse/gla
8-7-57
cc to: Admr.'s Reading File
Code 700, Mr. Knouse
THKiilsgaard, Rm. 5224
DMEA Field Team, Region III (2)
Operating Committee

8623

DOCKET COPY

Knowne
Ellis

August 6, 1957

Summary of Proposed Project

Object: Denial of application for exploration aid.

Docket No.: DMEA-4751

Commodity: Uranium

Applicant: Holly Corporation, a Delaware corporation
340 Third Street
P. O. Box 1509
Albuquerque, New Mexico

Property: Leased property listed below:

1. Owners: John M. and Rosa Koller
T. 8 S., R. 3 E., B.H.M. & B.
Sec. 34 - South half
Sec. 35 - NW¼ SW¼, SW¼ NW¼

T. 9 S., R. 3 E., B.H.M. & B.
Sec. 3 - E½W½, W½E½, E½NE¼
Sec. 2 - W½NW¼

880 acres

2. Owners: William and Mary Erschen
~~and Philip Erschen~~
T. 9 S., R. 3 E., B.H.M. & B.
Sec. 3 - W½NW¼
Sec. 4 - NE¼ and N½NW¼
Sec. 5 - N½ NW¼
Sec. 6 - NE¼, N½ NW¼, SE¼NW¼, E½SW¼, and SW¼SW¼

T. 8 S., R. 3 E., B.H.M.& B.
Sec. 31 - SE¼, S½SW¼, NE¼SW¼, and SE¼NE¼
Sec. 32 - S½ and S½NW¼
Sec. 33 - S½S½

1,680 acres

3. Owner: Philip Erschen
Sec. 3 - W½SW¼
Sec. 4 - SE¼
Sec. 9 - N½ and SE¼
Sec.10 - W½W½
Sec.15 - NW¼NW¼

920 acres

4. Owners: B. H. and Amy Lord
T. 9 S., R. 3 E., B.H.M.& B.
Sec. 10 - E½NW¼, W½NE¼, E½SW¼, and W½SE¼
Sec. 15 - NE¼NW¼, and NW¼NE¼
400 acres

5. Owners: Albert and Carrie Nelson
T. 8 S., R. 3 E., B.H.M.& B.
Sec. 29 - S½S½
Sec. 32 - N½NW¼, and NE¼
Sec. 33 - NW¼, N½SW¼, and NW¼SE¼
680 acres

Property Rights:

Applicant controls property listed above as follows:

1. Property of John M. and Rosa Koller by lease assignment from W. A. Carlson, dated March 20, 1957.

2 and 3.* Property of William and Mary Erschen by lease assignment from A. H. McRae, dated March 8, 1957.

4. Property of B. H. and Amy Lord by lease assignment from W. A. Carlson, dated March 15, 1957.

5. Property of Albert and Carrie Nelson by lease assignment from W. A. Carlson, dated March 27, 1957.

Date of application: May 15, 1957
Amount of application: $70,942.78
Referred to Region III: June 10, 1957
Field examination made: June 26, 1957
Field Team report received: July 29, 1957

Work Proposed: A three-phase core and non-core drilling program from the surface to test the underlying Cretaceous Inyan Kara group, which includes the Fall River and Lakota formations. (These formations are the favorable host rocks for uranium deposits in the Black Hills.)

* and Philip Erschen

Phase I

Consists of 46 non-core holes, totaling 24,050 feet, 25 holes to be drilled across structural terraces on 1,500 to 2,000-foot centers, and to a depth of 500 feet. The remaining 21 holes are to be drilled along the upper axis and west limb of the Sheep Canyon monocline to an average depth of 550 feet.

Phase I Alternate

Consists of 22 non-core holes drilled along two crudely defined E-W lines.

Phase II

Consists of 30 non-core holes, aggregating 14,000 feet averaging 467 feet deep, on a pattern determined by the results of Phase I drilling. In addition, 100 feet of core drilling through the ore-bearing horizon in offset holes to Stage I that encountered significant mineralization.

Phase III

Consists of 20 holes, 7,000 feet of non-core and 1,500 feet of core drilling, on a tentative spacing of 200-foot centers to determine extent of mineralized trends.

Estimated Costs:

Independent Contracts

Phase I

24,050 ft. non-core drilling (46 holes) @ $0.75 to $1.20/ft.	$21,960.00	
24 hrs. bulldozing @ $15/hr.	360.00	$22,320.00

Phase II

14,000 ft. non-core drilling (30 holes) @ $0.75 to $1.20/ft.	$12,300.00	
100 ft. core drilling 16 @ $4.00/ft.	400.00	
~~10~~ hrs. bulldozing @ $15/~~ft.~~ hr.	240.00	12,940.00

Phase III

7,000 ft. non-core drilling (20 holes) @ $0.75 to $1.20/ft.	$ 6,300.00	
1,500 ft. core drilling @ $3.00 to $5.00/ft.	6,000.00	
16 hrs. bulldozing @ $15/hr.	240.00	$12,540.00
Geophysical Logging Phases I, II, and III @ $0.13/ft.		6,064.50
Total Independent Contracts		$53,864.50

Labor, Supervision, Consultants

Geologist - 6 mos. @ $675.00/mo.	$4,050.00	
Geologist assistant - 6 mos. @ $300.00/mo.	1,800.00	
Surveyor - 2 mos. @ $600/mo.	1,200.00	
Rodman - 2 mos. @ $300.00/mo.	600.00	
Secretary - 2 mos. @ $300.00/mo.	600.00	
		$ 8,250.00

Operating Materials and Supplies

Stakes, sample sacks, etc.		85.00

Operating Equipment

Transit and Babbel Counter rental	150.00	
2-½-ton pickup trucks, 240 days @ $5.00/day	1,200.00	
		$ 1,350.00

Miscellaneous

200 chemical analyses @ $5.00/sample	$1,000.00	
Equipment repairs $25.00/mo. - 6 mos.	150.00	
Accounting @ $100.00/mo., 6 mos.	600.00	
Payroll taxes and comp. ins.	643.28	2,393.28
Contingencies		5,000.00
Total Estimated Cost of the Project		$70,942.78
Government Participation @ 75%		$53,207.08

Using the alternate Phase I program, submitted by the Applicant, the total proposed project cost is $61,044.28.

Field Team report, dated June 24, 1957, by D. H. Richter, USGS, and E. A. Binyon, USBM

The property is along the southern boundary of the Edgemont uranium district. Rocks exposed on the property are (oldest to youngest) (1) Fall River sandstone, (2) Skull Creek shale, (3) Newcastle sandstone, and (4) Mowry shale, all of Lower Cretaceous age.

Favorable lithologic units for uranium deposition in the area are the Fall River channel sandstone, upper Lakota Gould channel sandstone, or the lower Lakota thick, channel-type sandstones. With the exception of the northeastern portion of the property, where a small area is underlain by thick Fall River channel sandstone, none of these units are known to occur on the property.

Structurally, the land is favorably situated. The property straddles the Sheep Canyon monocline and includes large areas of gently-dipping terraces on both sides of the axis of this structure. However, regardless of these favorable structural and geochemical factors which may control or influence uranium deposition, the primary prerequisite appears to be a favorable lithologic environment--and this the subject property lacks.

The Fall River channel sandstone contains a few small, scattered uranium deposits north of the property. However, there is no reason to believe that larger and higher grade deposits exist in this horizon on the property. Three AEC drill holes on the terrace east of the Sheep Canyon monocline failed to disclose significant mineralization.

Although there possibly may be other favorable lithologic units underlying the alluvium and younger rocks which cover large areas of the property, it is recomemended that until the Applicant produces some evidence of a more definite target, the application be denied without prejudice.

Commodity Members' comments:

U. S. Bureau of Mines, dated August 1, 1957, by James Paone.

Agrees with Field Team -- denial without prejudice.

U. S. Geological Survey, dated August 2, 1957,
by N. E. Nelson

"The applicant proposed drilling the property systematically, but in the opinion of the examiners such work, with DMEA assistance, is not warranted. The Fall River formation is exposed by erosion in a small corner of the property, but the examiners believe the three lithologic units considered essential for localization of significant uranium deposits are lacking in that area. That such exist under drift and younger rocks is a possibility, but they would have to be drilled for blindly.

"Therefore the examiners and the Field Team recommend that the application be denied, but without prejudice.

"I concur with the recommendation."

Division of Rare and Miscellaneous Metals,
F. L. Knouse, August 5, 1957

A substantial part of the program proposed by the Applicant is considered to be prospecting, and until some evidence of a more definite target is presented, the application should be denied without prejudice.

Conclusions

The probability of making a significant discovery is not sufficiently promising to justify Government participation. If future work on the property reveals evidence which could materially alter this opinion, and such evidence is presented, it should be considered at that time. In the meantime, the application should be denied without prejudice.

Ernest Wm. Ellis

Ernest Wm. Ellis, Director
Division of Rare and
Miscellaneous Metals

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

IN REPLY REFER TO:

	INITIALS	CODE
8/6	P.K.	220
"	FLK	700

August 2, 1957
Re: DMEA 4751
Holly Corporation
Leased Properties
Fall River County, South Dakota
$70,942.78 - Uranium

Memorandum

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

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

Subject: Review of Field Team Report

The applicant requested assistance in prospecting by drilling for inferred structural and lithological features favorably regarded as loci of uranium mineralization in the Black Hills region. No specific structure, except perhaps the Sheep Canyon monocline, is known to exist on the property. A.E.C. drilling failed to encounter mineralization in the vicinity of that feature.

The applicant proposed drilling the property systematically, but in the opinion of the examiners such work, with DMEA assistance, is not warranted. The Fall River formation is exposed by erosion in a small corner of the property, but the examiners believe the three lithologic units considered essential for localization of significant uranium deposits are lacking in that area. That such exist under drift and younger rocks is a possibility, but they would have to be drilled for blindly.

Therefore the examiners and the Field Team recommend that the application be denied, but without prejudice.

I concur with the recommendation.

N. E. Nelson

N. E. Nelson

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August 1, 1957

4751

Uranium
Holly Corp.
Land in T.8 and 9 S.,R. 3 E. BHPM
Fall River County, S. Dakota
$70,942.78

Ernest William Ellis, DMEA Member
Uranium Commodity Committee
James Paone, Bureau of Mines Member
Uranium Commodity Committee

Field Team Report

7/25/57

8/1/57

x without prejudice
x ~~without prejudice~~

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

224 New Customhouse
Denver 2, Colorado

July 25, 1957

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Memorandum

To: Secretary to the Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Docket DMEA 4751 (Uranium) Holly Corporation (Land in T. 8 and 9 S., R. 3 E., B.H.P.M.), Fall River County, South Dakota - Joint Report of Examination

Enclosed are the original and two copies of a Joint Report of Examination on the subject property by E. O. Binyon, USBM, and D. H. Richter, USGS.

The field examiners conclude that the probability for making a significant discovery is not sufficinetly promising to justify Government participation. Accordingly, they recommend that the Applicant's work proposal be denied, without prejudice, in which the Field Team concurs.

W H King

W. H. King

Reviewed by
DMEA OPERATING COMMITTEE
7-31-57
(date)

ON-SITE EXAM. REPORT

IN REPLY REFER TO:

DMEA

DEPARTMENT OF THE INTERIOR

JUL 25 1957

REGION III

DENVER, COLORADO

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Defense Minerals Exploration Administration

Denver Federal Center

Denver, Colorado

July 24, 1957

TRANSMITTED

JUL 25 1957

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 4751 (Uranium) Holly Corporation (Land in T. 8 and 9 S., R. 3 E., B.H.P.M.), Fall River County, South Dakota

Enclosed are the original and eight copies of a joint report by D. H. Richter, U. S. Geological Survey, and E. O. Binyon, U. S. Bureau of Mines, covering their examination of the subject property.

The Holly Corporation proposes to explore for uranium in the Inyan Kara group of sedimentary rocks by a three-stage program of rotary core and non-core drilling at an estimated cost of $70,942.78.

The examiners conclude, and I concur, that favorable lithologic controls for ore deposits are not known to be present on the property. Denial of the application is recommended, in this case without prejudice due to the lack of data on certain areas buried under alluvium or past-Inyan Kara rocks.

Original signed by

E. N. HARSHMAN

E. N. Harshman

Member, Field Team

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Enclosures (9)

ENHarshman:mp

Reviewed by

DMEA OPERATING COMMITTEE

7-31-57

(date)

FOR UNITED STATES GOVERNMENT USE ONLY

TRANSMITTED
JUL 25 1957

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA
DEPARTMENT OF THE INTERIOR
JUL 25 1957
REGION III
DENVER, COLORADO

DMEA 4751

Holly Corporation

Deeded Land in T. 8 and 9 S., R. 3 E., B.H.M.

Fall River County, South Dakota

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Uranium

Joint Engineering and Geological Report

by

D. H. Richter, Geologist
Geological Survey

E. O. Binyon, Mining Engineer
Bureau of Mines

July 24, 1957

Reviewed by
DMEA OPERATING COMMITTEE
7-31-57
(date)

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ILLUSTRATIONS

Figure — Follows page

1. Location map, Holly Corporation, Deeded Land, T. 8 & 9 S., R. 3 E., B.H.M., Fall River County, South Dakota. DMEA 4751..... 3

2. Map showing distribution of channel sandstones and location of McAlester Fuel Company and Holly Corporation properties, Fall River County, South Dakota. DMEA 4751..... 17

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DMEA 4751

HOLLY CORPORATION
DEEDED LAND IN T. 8 and 9 S., R. 3 E., B.H.M.
FALL RIVER COUNTY, SOUTH DAKOTA

INTRODUCTION AND SUMMARY

Holly Corporation, a Delaware Corporation, 340 Third Street, N.W., Albuquerque, New Mexico, on May 29, 1957, applied to the Defense Minerals Exploration Administration for aid in exploration of contiguous tracts of deeded land for uranium. These lands are in secs. 29, 31, 32, 33, 34, and 35, T. 8 S., R. 3 E., and secs. 2, 3, 4, 5, 6, 9, 10, and 15, T. 9 S., R. 3 E., B.H.M., Fall River County, South Dakota.

The applicant proposes to explore the property under a three-phase program consisting of rotary non-core and core drilling. A total of 96 non-core holes with an aggregate total footage of 45,050 feet and a total of 1,600 feet of rotary core drilling at an over-all estimated cost of $70,942.78, is proposed by the applicant. The program is designed to explore the Cretaceous Inyan Kara group which includes the Fall River and Lakota formations. These formations are the favorable host rocks for uranium deposits in the Black Hills. On July 6, 1957, the applicant submitted an alternate exploration program,

which slightly modified the original Stage I proposals, at an overall estimated cost of $61,044.28.

A field examination of the property was made June 26, 1957, by D. H. Richter, geologist, U. S. Geological Survey, and E. O. Binyon, mining engineer, U. S. Bureau of Mines. The examiners were accompanied by Paul E. Melancon and J. T. Sullivan, geologists for the applicant.

Results of the examination indicated that while the property overlies favorable structural and possible favorable geochemical elements, it does not have, in their entirety, any of the three main lithologic units that control the localization of the significant uranium ore deposits in the Black Hills region. Although there possibly may be other favorable lithologic units underlying the alluvium and younger rocks which cover large areas of the property, it is recommended that until the applicant produces some evidence of a more definite target, the application be denied without prejudice.

ACKNOWLEDGMENTS

Acknowledgment is due Paul E. Melancon and J. T. Sullivan, the corporation's geologists, for directing the examining team over the property. Ray Barkeley, geologist for the A.E.C. in Hot Springs, South Dakota, was consulted at the time of the examination.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The leased land is in secs. 29, 31, 32, 33, 34, and 35, T. 8 S., R. 3 E. and secs. 2, 3, 4, 5, 6, 9, 10, and 15, T. 9 S., R. 3 E., B.H.M., Fall River County, South Dakota (fig. 1). Edgemont, South Dakota, adjoins the property on the west. The northern and eastern parts of the land are easily accessible from secondary roads off U. S. 85A and 18, 3.0 and 6.1 miles respectively east of Edgemont. South of the Cheyenne River the property can be reached by secondary roads off of South Dakota State Highway 52.

The relief is low. The land slopes gently to the west from an altitude of 3,825 feet in the extreme northeastern corner of the property to 3,500 and 3,400 feet on the west and at the southern end respectively. The Cheyenne River flows eastward across the property to about the middle and then flows south to the extreme southern boundary.

The property is also cut by Sheep Canyon, a main topographic feature with about a 200-foot difference in elevation between the rim and canyon floor. A few small canyons or draws were the only other noticeable features.

Water is available from the town of Edgemont or the Cheyenne River. No power facilities are on the property. A small amount of timber is found along the canyon rims and vegetation is limited to grasses, and cacti. The climate is typical of the north central

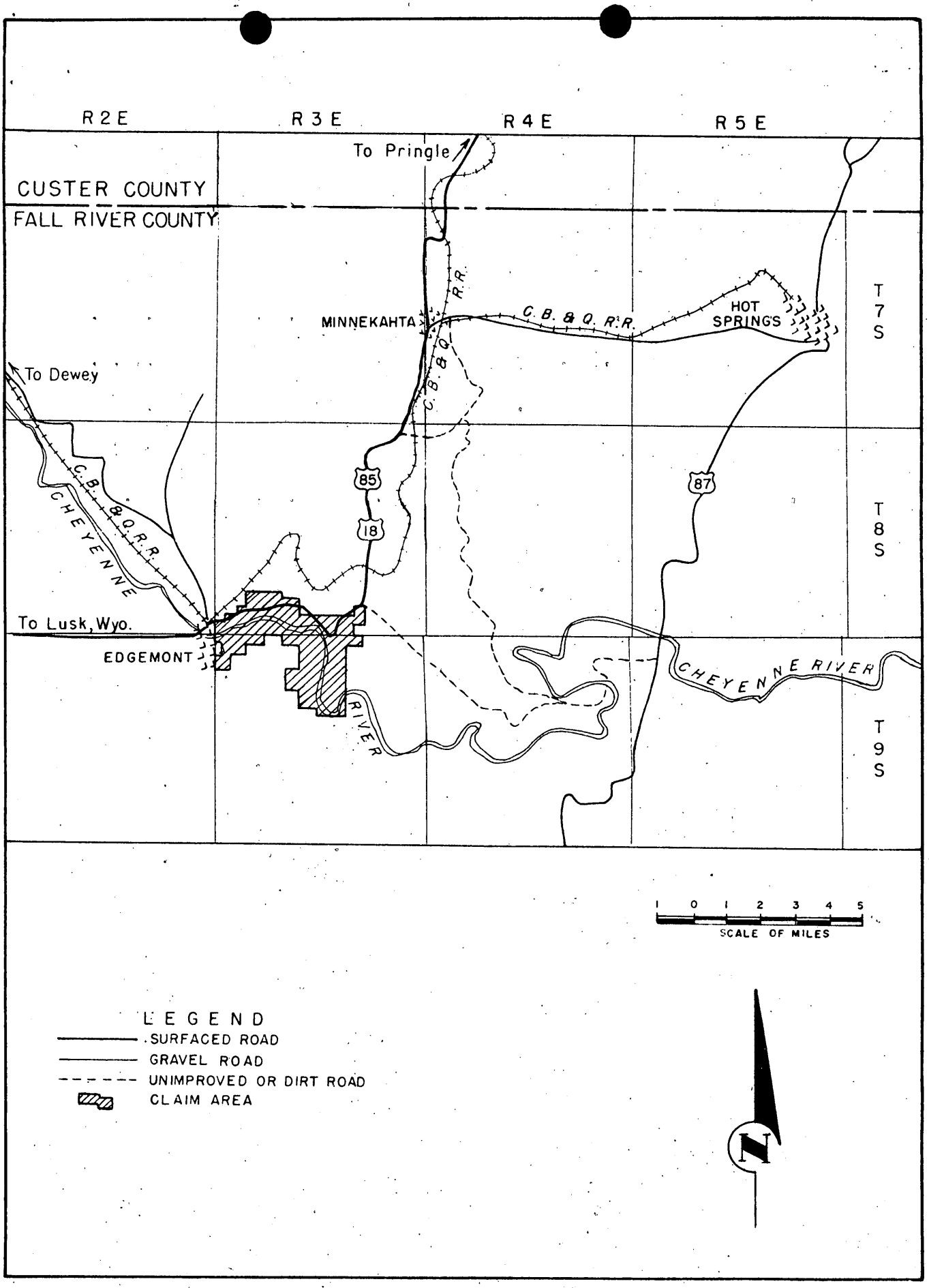

FIGURE 1 - LOCATION MAP, HOLLY CORPORATION, DEEDED LAND, T.8 & 9 S., R.3 E., B.H.M., FALL RIVER COUNTY, SOUTH DAKOTA. DMEA 4751

states with moderate summer temperatures and cold winters. Winter and early spring snowfall and rains make travel difficult and during a severe winter may block the roads entirely for short periods. Outside operations can be carried on for about 10 months of the year without undue difficulty.

Edgemont, South Dakota, a railpoint on the Chicago, Burlington, and Quincy railroad and the site of a 400-ton uranium mill, is the nearest source of labor, small equipment, and supplies.

OWNERSHIP

Holly Corporation, the applicant, has included in the application a total of 4,560 acres of deeded land which they hold under four separate leases.

The owners of the land are as follows:

John M. and Rosa Koller

T. 8 S., R. 3 E., B.H.M.

Sec. 34 - S 1/2

Secs. 35 - NW 1/4 SW 1/4, and SW 1/4 NW 1/4

T. 9 S., R. 3 E., B.H.M.

Sec. 3 - E 1/2 W 1/2, W 1/2 E 1/2, E 1/2 NE 1/4

Sec. 2 - W 1/2 NW 1/4

880 acres

William and Mary Erschen and Philip Erschen

T. 9 S., R. 3 E., B.H.M.

Sec. 3 - W 1/2 NW 1/4

Sec. 4 - NE 1/4 and N 1/2 NW 1/4

Sec. 5 - N 1/2 NW 1/4

Sec. 6 - NE 1/4, N 1/2 NW 1/4, SE 1/4 NW 1/4, E 1/2 SW 1/4, and SW 1/4 SW 1/4

T. 8 S., R. 3 E., B.H.M.

Sec. 31 - SE 1/4, S 1/2 SW 1/4, NE 1/4 SW 1/4, and SE 1/4 NE 1/4

Sec. 32 - S 1/2 and S 1/2 NW 1/4

Sec. 33 - S 1/2 S 1/2

1,680 acres

Philip Erschen

Sec. 3 - W 1/2 SW 1/4

Sec. 4 - SE 1/4

Sec. 9 - N 1/2 and SW 1/4

Sec. 10 - W 1/2 W 1/2

Sec. 15 - NW 1/4 NW 1/4

920 acres

Total under this lease 2,600 acres

B. H. and Amy Lord

T. 9 S., R. 3 E., B.H.M.

Sec. 10 - E 1/2 NW 1/4, W 1/2 NE 1/4, E 1/2 SW 1/4 and W 1/2 SE 1/4

Sec. 15 - NE 1/4 NW 1/4 and NW 1/4 NE 1/4

400 acres

Albert and Corrie Nelson

T. 8 S., R. 3 E., B.H.M.

Sec. 29 - S 1/2 S 1/2

Sec. 32 - N 1/2 NW 1/4 and NE 1/4

Sec. 33 - NW 1/4 N 1/2 SW 1/4 and NW 1/4 SE 1/4

	680 acres
Total	4,560 acres

HISTORY AND PRODUCTION

The property has no history except that the A. E. C. drilled three holes located in the SW 1/4 SW 1/4 sec. 34, T. 9 S., R. 3 E., the NE 1/4 SW 1/4 of sec. 3, and NE 1/4 NW 1/4 of sec. 10, T. 9 S., R. 3 E. There has been no production, past or present from the property.

PRESENT STATUS

As the entire acreage under lease is deeded land no discovery or assessment work is required. No mining or milling equipment or other facilities are on the property.

GEOLOGY

General statement

The leased land of the Holly Corporation is along the southern boundary of the Edgemont uranium district in the southern Black Hills of South Dakota. The consolidated rocks exposed on the property, are, from oldest to youngest: (1) Fall River sandstone, (2) Skull Creek shale, (3) Newcastle sandstone, and (4) Mowry shale, all of Lower Cretaceous age. The Fall River sandstone is the only member of the Inyan Kara group, the significant uranium ore-bearing group in the Black Hills, exposed on the property. The Cheyenne River valley covers a large portion of Holly Corporation property and consequently many areas are covered by thick alluvium deposits.

Structural deformation throughout the area is a result of the Laramidian (?) Black Hills uplift and in general the attitude of the strata depends upon their position with respect to the elongate Black Hills dome. Superimposed on this regional homocline are a number of south-trending and plunging anticlines, monoclines, and structureal terraces which locally greatly affect the regional dip of the strata.

Extensive field investigations by the U. S. Geological Survey[1/] during the past three years have yielded considerable information

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1/ Bell III, H. et al., Lithologic and structural controls of uranium deposition in the southern Black Hills, South Dakota: U. S. Geol. Survey Prof. Paper 300, p. 345-349, 1956.

regarding various relationships between geology and uranium deposition in the southern Black Hills. Moreover, some of these interrelationships, which are listed below, appear to have been controlling, or at least influencing, factors in the localization of uranium minerals:

Lithologic controls

1. Sandstone-filled channels.--The uranium deposits are restricted to three distinct types of sandstone referred to as A, B, and C. Type A, the Gould channel sandstone, is characterized by its heterogeneity: it is fine- to coarse-grained, conglomeratic and non-carbonaceous. The Gould deposit occurs in this type of upper Lakota sandstone. Type B sandstone forms large units that truncate and overlap underlying lenses and also appears to grade laterally into finer-grained facies. Type B is fine- to medium-grained, homogeneous in texture and structure and contains scattered pockets and lenses of carbonaceous trash. Type B, which is best developed in the lower part of the Lakota formation and the Fall River formations, contains the large ore deposits of the Runge mine. Type C sandstone occurs in a series of alternating thin carbonaceous siltstones and mudstones in the lower part of the Fall River formation. No large ore deposits are known to occur in this type.

2. Other lithologic factors which certainly influence the localization within the channels are porosity and permeability which, in turn, are dependent upon the heterogeneity, thickness, continuity, and cementation of the sandstones.

Structural controls

1. Structural terraces and areas of local flattening of dip are apparently favorable structures for uranium localization. Steeply dipping structures are unfavorable.

Geochemical controls

1. Carbonate-cemented sandstones.--Recent work[1/] by the U. S. Geological Survey indicates that the solutions depositing calcium carbonate in the sandstones of the Inyan Kara rocks also carried uranium and therefore geochemically favorable environments for the localization of uranium deposits would be marginal to large areas of carbonate-cemented sandstone.
2. Ground water.--Recent subsurface exploration and mineralogical studies strongly suggest that both uranium and vanadium have been moved in Recent time by vadose water and precipitated down dip at the true or perched ground water level, or in some other favorable environment for the deposition of uranium minerals.

1/ Gott, G. B., Inferred relationship of some uranium deposits and calcium carbonate cement in southern Black Hills, South Dakota: U. S. Geol. Survey Bull. 1046-A. 1956.

3. Carbonaceous material.--The black, relatively unoxidized-type ores with a high V/U ratio are generally concentrated in areas that contain an abundance of carbonaceous trash. In some deposits pyrite may also act as a reducing agent for the stabilization and/or precipitation of uranium minerals in the low valence uranous state (U^{4+}).

Holly Corporation property

With the exception of the extreme northeast portion of the property, where a small area is underlain by thick Fall River channel sandstones, none of the favorable lithologic units--the Fall River channel sandstone, upper Lakota Gould channel sandstone, or the lower Lakota thick channel-type sandstones--are known to occur in the subject area (fig. 2). Structurally, the Holly Corporation land is very favorably situated; the property straddles the Sheep Canyon monocline and includes large areas of gently-dipping terraces on both sides of the axis of this structure. The applicant also stresses the ground water theory of movement of uranium solutions and deposition at or near the permanent water table and believes that the property is ideally situated for such phenomena.

However, regardless of these favorable structural and geochemical factors which may control or influence uranium deposition, the primary prerequisite appears to be a favorable lithologic environment--and this the subject property lacks.

Although the Fall River channel sandstone contains a few small scattered uranium ore deposits to the north of the Holly Corporation property (Mining Research Corporation, DMEA 3342) there is no reason to believe that this indicates larger and higher grade deposits in the small area of lithologic favorability on the subject property. Furthermore three A.E.C. drill holes on the terrace east of the Sheep Canyon monocline failed to disclose any significant mineralization.

ORE RESERVES

No ore reserves are known to occur on the subject property at the present time.

PROPOSED EXPLORATION PROGRAM

The applicant proposes to explore the property by rotary non-core and core drilling under a three-phase program. A total of 96 non-core holes with an aggregate total footage of 45,050 feet and a total of 1,600 feet of core drilling are proposed for the three phases.

Under phase I 46 non-core holes with a total footage of 24,050 feet are to be drilled. Twenty-five of these are to be drilled across the structural terrace on 1,500-and 2,000-foot centers and to a depth of 500 feet. The remaining 21 are to be drilled along the

upper axis and west limb of the Sheep Canyon monocline. Depth of these holes will average 550 feet. No core drilling is to be done under this phase. For phase II 30 non-core holes are to be drilled on a pattern determined by the results of phase I drilling. The holes are to be drilled to an average depth of 467 feet or a total of 14,000 feet. One hundred feet of core drilling is to be done under phase II. Phase III drilling is to determine direction and extent of mineralized trends and coming through the mineralized horizon is suggested. Under this phase 7,000 feet of non-core and 1,500 feet of core drilling are proposed.

A total of 56 hours of dozer work and 46,650 feet of geophysical logging is also proposed.

On July 6, 1957, the applicant submitted an alternate phase I program, consisting of 22 non-core holes (instead of 46) along 2 crudely defined E-W fences.

Estimate of Costs

Independent Contracts

Phase I Drilling

Rotary non-core

	No. of Holes	Interval	Footage	Unit Cost	Total
	46	0-200	9,200	$0.75	$ 6,900.00
		200-400	9,200	0.90	8,280.00
		400-600	5,650	1.20	6,780.00
Totals	46		24,050		$21,960.00
Rotary core	--	--	--	--	--
Phase I Totals	46		24,050		$21,960.00
Phase II Drilling					
Rotary non-core					
	30	0-200	6,000	$0.75	$ 4,500.00
		200-400	6,000	0.90	5,400.00
		400-600	2,000	1.20	2,400.00
			14,000		$12,300.00
Rotary core					
			100	4.00	400.00
Phase II Totals	30		14,100		$12,700.00

Phase III Drilling

Rotary non-core

	No. of Holes	Interval	Footage	Unit Cost	Total
	20	0-200	3,000	$0.75	$ 2,250.00
		200-400	2,500	0.90	2,250.00
		400-600	1,500	1.20	1,800.00
Totals			7,000		$ 6,300.00
Rotary core					
		0-200	500	3.00	1,500.00
		200-400	500	4.00	2,000.00
		400-600	500	5.00	2,500.00
Totals			1,500		$ 6,000.00
Phase III Totals	20		8,500		$12,300.00
Total non-core Drilling	96		45,050		$40,560.00
Total core Drilling	--		1,600		6,400.00
Total Drilling			46,650		$46,960.00

Bulldozer Operations

	Hours	Unit Cost	Cost
Phase I	24	$15.00	$360.00
II	16	15.00	240.00
III	16	15.00	240.00
Total	56		$840.00

Geophysical Logging

	Footage	Unit Cost	Total Cost
Phase I, II, and III	46,650	$0.13	$6,064.50

Total Independent Contracts $53,864.50

Labor, Supervision, Consultants		
1 Geologist, 6 mos. at $675.00/mo.	$ 4,050.00	
1 Geologist Assistant, 6 mos. at $300/mo.	1,800.00	
1 Surveyor, 2 mos. at $600.00/mo.	1,200.00	
1 Rodman, 2 mos. at $300.00/mo.	600.00	
1 Secretary, 2 mos. at $300.00/mo.	600.00	
Total		$ 8,250.00
Operating Materials and Supplies		
Laths and stakes	$ 50.00	
Sample Sacks	10.00	
Miscellaneous	25.00	
Total		$ 85.00
Operating equipment		
Transit, 2 mos. rental	$ 100.00	
Babbel Counter (2) rental	50.00	
1-1955 Chevrolet 1/2-ton pickup. Operating cost 180 days (maximum) at $5.00/day	900.00	
1-1952 Ford 1/2-ton pickup, 60 days at $5.00/day	300.00	
Total		$ 1,350.00

Rehabilitation and repairs				None
New buildings, improvements, installations				None
Miscellaneous				
	No. of samples	Unit Cost	Total Cost	
Assaying Phase I, II, and III (Every 5th sample for V_2O_5 and $CaCo_3$)	200	$5.00	$ 1,000.00	
Equipment repairs $25.00/mo. for 6 mos.			150.00	
Accounting $100.00/mo. for 6 mos.			600.00	
Workman's compensation, liability, unemployment insurance and payroll taxes. 7.79% of $8,250.00			643.28	
Total				$ 2,393.28
Contingencies				$ 5,000.00
Total Proposed Project Cost				$70,942.78

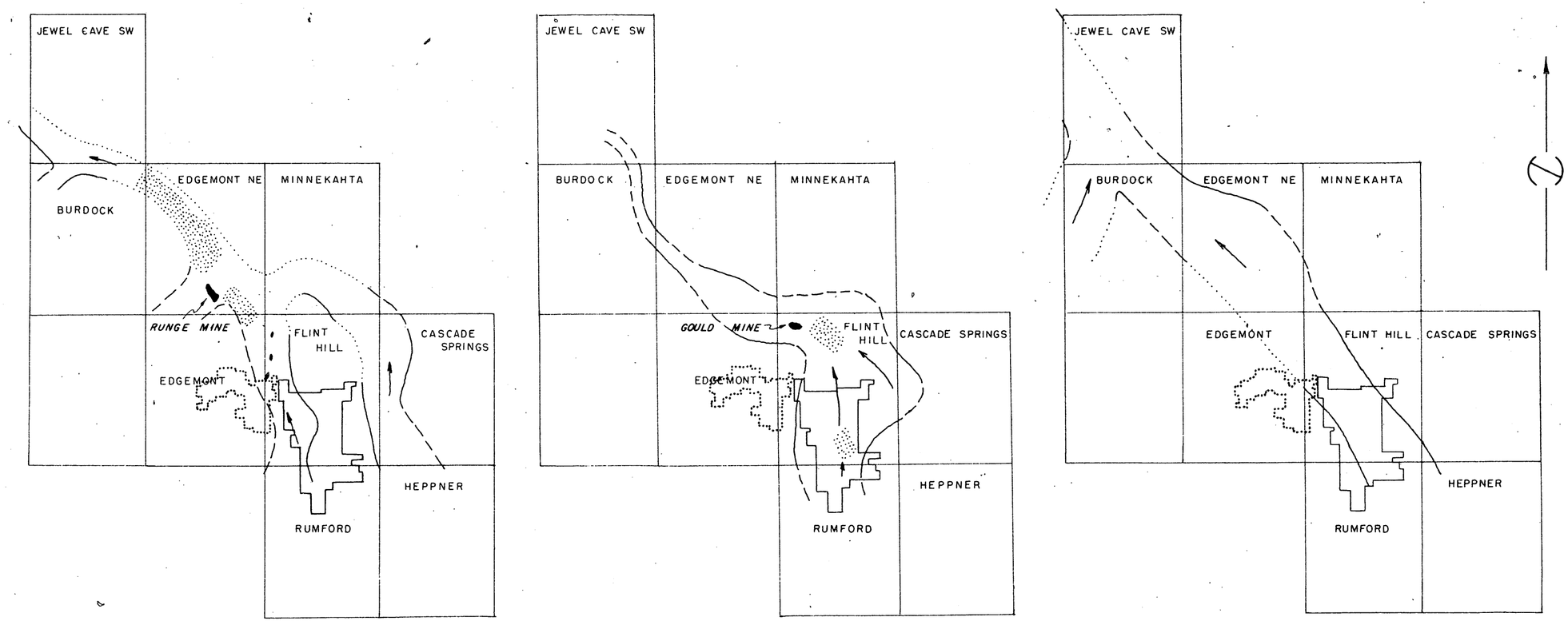
Using the alternate Phase I program, submitted by the applicant, the total proposed project cost is $61,044.28.

The applicant states that the project will start within 45 days and be completed within 6 months.

CONCLUSIONS AND RECOMMENDATIONS

The Holly Corporation property, although overlying favorable structural and possible favorable geochemical elements, does not contain, in their entirety, any of the three main lithologic units

which have controlled the localization of the significant uranium ore bodies in the Black Hills region. However, due to the cover of younger rocks and alluvium over large areas of the subject property, other favorable lithologic units, which may have influenced the deposition of uranium minerals, may be present. Therefore, in light of the lack of positive information concerning the Holly Corporation property, the examiners recommend that the application be denied without prejudice.



A. CHANNEL SANDSTONE IN THE FALL RIVER FORMATION.

B. CHANNEL SANDSTONE (GOULD) IN THE UPPER PART OF THE LAKOTA FORMATION.

C. THICK CHANNEL SANDSTONES IN THE LOWER PART OF THE LAKOTA FORMATION.

EXPLANATION

Boundary of channel sandstone (A&B) and thick channel sandstones (C). Dashed and dotted where buried.

Direction of current flow and approximate area of deepest channels.

Area of high carbonate cement content.

Uranium ore deposit.

McAlester Fuel Co. property (DMEA 4742).

Holly Corporation property.

SCALE
0 5 10 miles

SOURCE OF INFORMATION:
U.S. Geol. Survey T.E.I.R. 640, pp 95-110.

D. Richter, July 1957

FIGURE 2. MAP SHOWING DISTRIBUTION OF CHANNEL SANDSTONES AND LOCATION OF MCALESTER FUEL COMPANY AND HOLLY CORPORATION PROPERTIES, FALL RIVER COUNTY, SOUTH DAKOTA.

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224 New Customhouse
Denver 2, Colorado

June 14, 1957

Memorandum

To: E. N. Marshman, DMEA/DPC } W/enclosures, Items 1-5

From: DMEA Field Team, Region III

Subject: Docket DMEA 4751 (Uranium) Holly Corporation (Land in Tps. 8 and 9 S., R. 3 E., BHM) Fall River County, South Dakota

Enclosed is the following material relating to the subject docket:

1. Copy of application for Government assistance in exploration work under the DMEA program.
2. Memorandum of Review by James Paone, USBM.
3. Memorandum of Review by N. E. Nelson, USGS.
4. Letter of transmittal of the foregoing to this office, dated June 10, 1957, from the Chairman, Operating Committee, DMEA.
5. Routing Control Sheet.

A field examination of the property and a joint report of findings and recommendations pertaining to the Applicant's work proposal are requested.

If the field examiners view the project proposal favorably, the Applicant should be instructed that we will require it to obtain a set, six copies of Form MF-205, Consent to Lien, signed by John M. Koller and Rosa Koller; a set signed by E. H. Lord and Amy Lord; a set signed by Albert Nelson and Carrie Nelson and a set signed by William Krechen, Mary Krechen and Philip Krechen all covering the lands described on page 1 of the applicable LEASE AND AGREEMENT.

DMEA Form 7
(12-56)

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Date	Surname	Code
6/6	Ellis	700
6/7	GCS	130
7	Matthews	100
6/6	JWD	220
		700

JUN 10 1957

Mr. E. N. Harshman
Acting Executive Officer
DMEA Field Team, Region III
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-4751 (Uranium)
Holly Corporation
Land in Tps. 8 and 9 S., R. 3 E., B.H.B.& M.
Fall River County, South Dakota

Dear Mr. Harshman:

The subject application is being referred to you for investigation, a field examination if deemed advisable, and recommendations.

Enclosed are memoranda, dated June 3 and 4, 1957, by James Paone, USBM, and N. E. Nelson, USGS, respectively, relating to the application. Also enclosed are two copies of the application (including Lease Agreements and Assignments) for the use of the Field Team. From your memorandum of transmittal, dated May 27, it would appear that you have retained two copies of the application. However, since we are not too sure of this, we are returning the two extra copies.

As stated in the commodity memoranda, the application appears to be considered prospecting. However, if it is decided otherwise and a project is recommended, we will require the usual Consent to Lien and Subordination Agreements, in which case your office should promptly request these documents and thus save time.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Enclosures

APPROVAL:

Frank D. Lamb (FDL)
Member, Bureau of Mines

Thor H. Kiilsgaard (THK)
Member, Geological Survey

EWEllis/gla
6-6-57
cc to: Admr.'s Reading File
Operating Committee
THKiilsgaard, Rm. 5224

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
6/6	Ellis	700
6/7	Selfridge	130
6/7	Lamb	130
6/7	Kilegaard	130
7	Mitchell	100
		220
		700

JUN 10 1957

Mr. Charles Chiusano, Vice President
Holly Corporation
340 Third Street, N. W.
P. O. Box 1509
Albuquerque, New Mexico

Re: Docket No. DMEA-4751 (Uranium)
Land in Tps. 8 and 9 S., R. 3 E., B.H.B.& M.
Fall River County, South Dakota

Dear Mr. Chiusano:

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

Mr. E. N. Harshman
Acting 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. Motander (fw)

Administrator

EWEllis/gla
6-6-57
cc to: Admr.'s Reading File
Code 700
DMEA Field Team, Region III (2)

8623

IN REPLY REFER TO:

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

June 4, 1957

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 5 1957

DATE	INITIALS	CODE
6/5	JWB	220
"	Ellis	700
	Comments	
	complete	

Re: DMEA 4751
Holly Corporation
Leased properties
Crook Co., S. Dak.
$70,942.78 - Uranium
vanadium

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 searching for inferred paleo channels and structural features in strata underlying the claims. Producing mines 4 to 8 miles to the north and northwest, are obtaining production from favorable structures in the underlying Fall River and Lakota rocks and, by inference, channels and structural traps may exist in the same strata beneath the applicant's large acreage.

Except for surface mapping and 3 reconnaisance drill holes of A. E. C., no exploratory work has been done on the property. The proposed drilling would be of a prospective nature as only inferred structures are assumed to exist and their ore bearing potentials are still more problematical.

Referral of the application to the Field Team is recommended.

N. E. Nelson

N. E. Nelson

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 4 1957

DATE	INITIALS	CODE
6/4	C	220
6/4	Ellis	700

June 3, 1957

DMEA Project No. 4751
DMEA Contract No.
Commodity Uranium
Name of applicant Holly Corp.
Name of property
Location of property Fall River County, S. Dakota
Estimated cost of project $70,942.78

Ernest William Ellis, DMEA Member
Uranium Commodity Committee
James Paone, Bureau of Mines Member
Uranium Commodity Committee

Application

(Applicant, Hold Form for Self, etc.)

A. Date of applicant document 5/27/57 B. Date received by reviewers 5/31/57

C. Is information on this form by items to reviewers: Yes [ ] No [ ]

D. Is information on nonfiscal matters from items to reviewers: Yes [ ] No [ ]

E. Information available on such projection: Yes [ ] No [ ]

F. Other pertinent factors from A to reviewers: Yes [ ] No [ ]

G. Refer to items marked yes above:

H. Criteria meeting specific consideration:
a. Location [ ]
b. Commodity [ ]
c. Evidence of mineralization [ ]
d. Geology [ ]
e. Proposed exploration method [ ]
f. Alternate exploration method [ ]
g. Costs [ ]
h. [ ]

I. Action required:
a. Obtain information from applicant [ ]
b. Refer to Hold Form [ ]
c. Reject [x] without prejudice ✓
d. Agree with Hold Form [ ]
e. Disagree with Hold Form [ ]
f. Suggest alternate plan [ ]
g. Request another consideration [ ]
h. Approval [ ]
i. Consult with Mr. _____ at _____ AEC office.

J. Remarks: (Use back of page if necessary) It does not appear that the subject property has advanced to the status of the exploration stage.

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

May 29, 1957

Holly Corporation,
340 Third Street, N.W.,
P.O. Box 1509,
Albuquerque, New Mexico.

Subject: DMEA 4751

Gentlemen:

Your application for exploration assistance, dated May 15, 1957, submitted to our office at Denver, Colorado, has been assigned Docket Number DMEA 4751 and referred to the Rare & Miscellaneous Metals Division in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

Allen S. Dakan, Director
Operations Control and
Statistics Division

Copy to: Region III.

Not mentioned in the Chairman's letter, but noticed by us is the fact that page 3 of the LEASE AND AGREEMENT dated March 20, 1957, between John M. Keller and Rosa Keller, and W. A. Carlson, states that the lease "shall not be assigned without written consent of the Lessors..." Assignment of this lease was made May 6, 1957, to Kelly Corporation. The Applicant should be informed that written consents to the assignment of these leases are required.

Twelve extra copies of each map used in the joint report which show the land to be subordinated and the location and extent of recommended work, relative to property boundaries, should be submitted if Government participation is recommended.

The Bureau of Mines' copy of the application should be returned to this office with the joint report of examination. Mr. Harshman will forward the Survey's copy of the application to the Washington office.

Original signed by
W. H. KING

W. H. King
Executive Officer

Enclosures

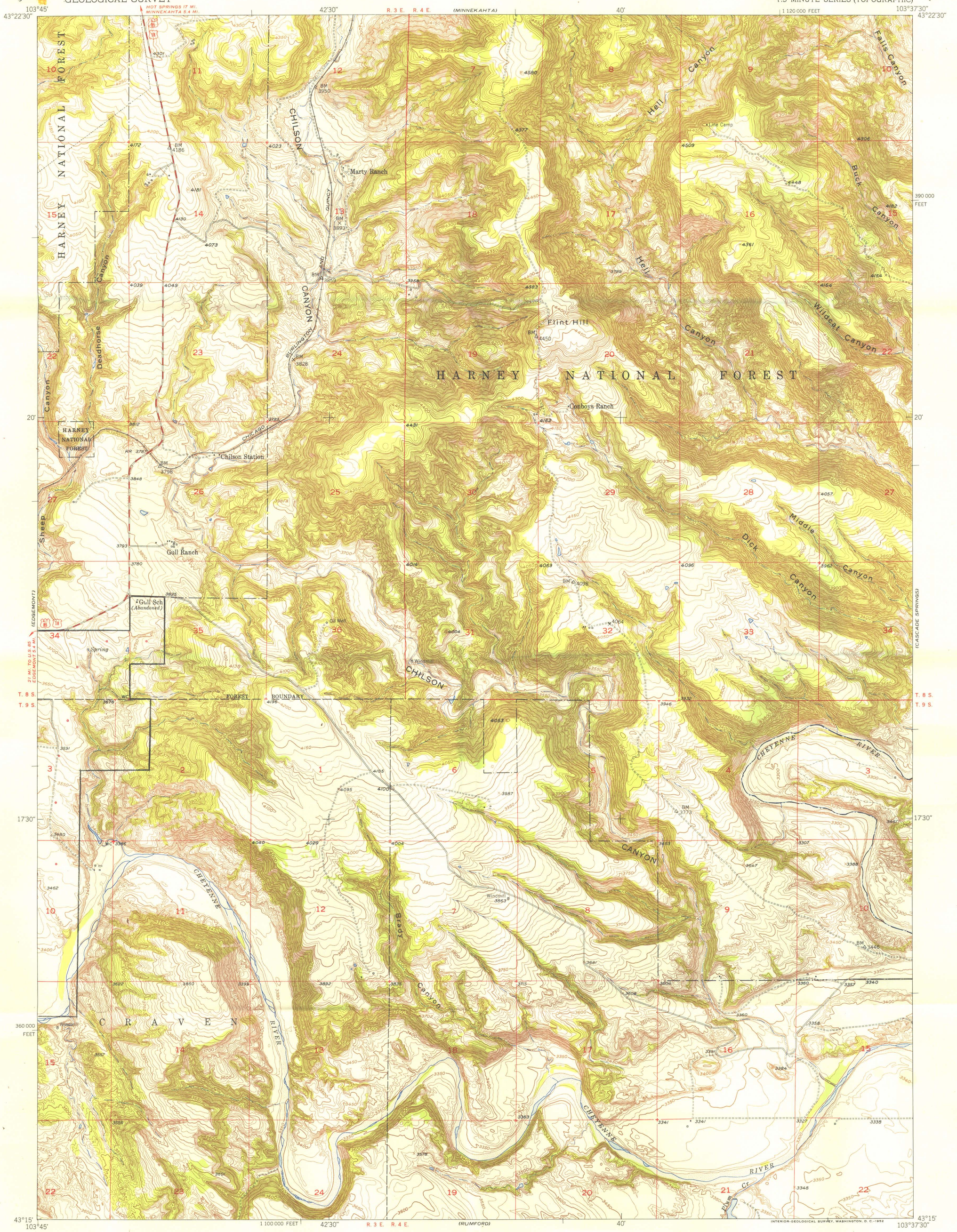
MMHsh

cc: Rec. Op. Comm. (2)
Harshman
BMRA/NPC
Boubert
Chron.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

FLINT HILL QUADRANGLE

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



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

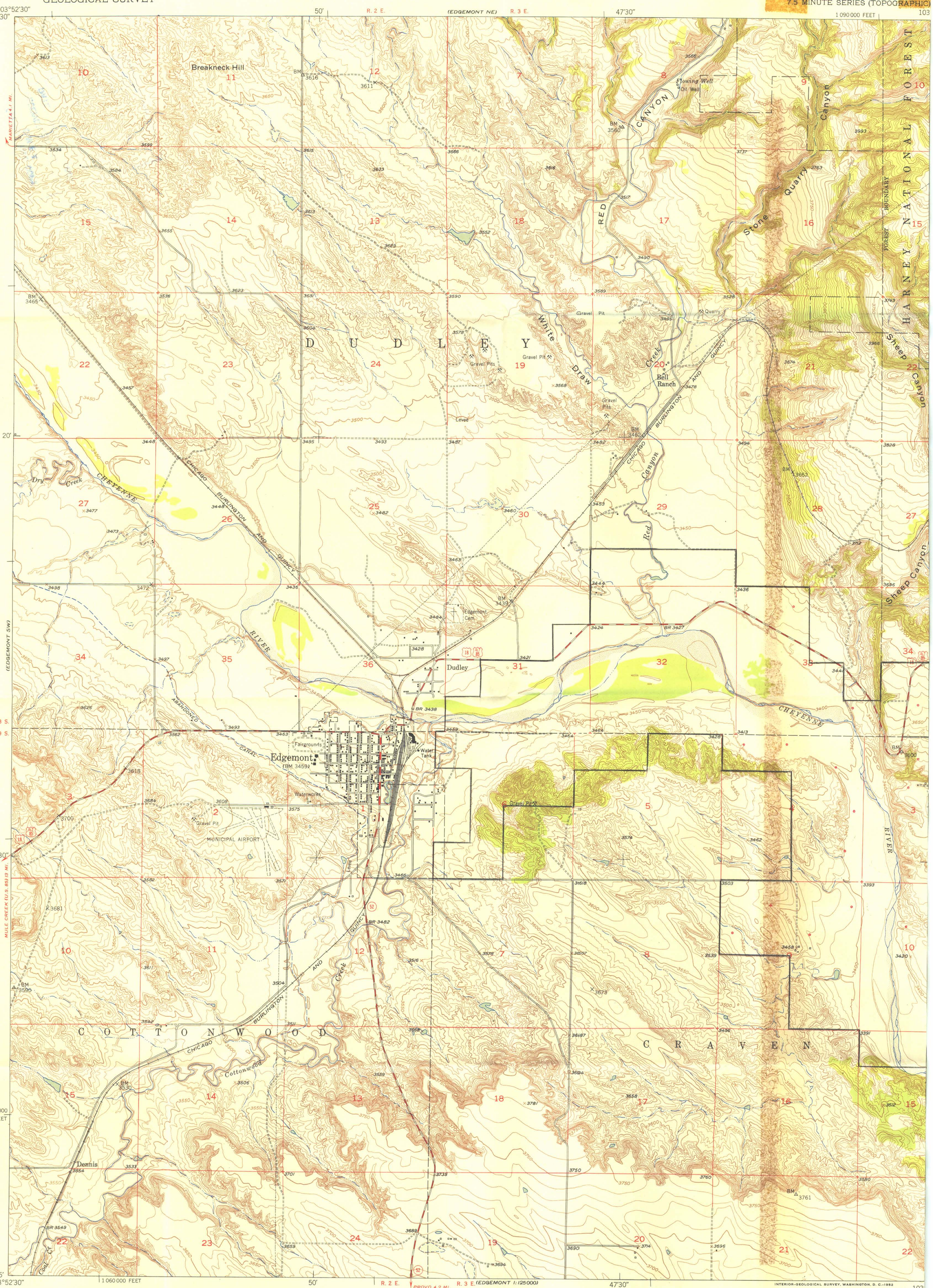
FLINT HILL, S. DAK.
N4315—W10337.5/7.5
1950

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

HOLLY CORPORATION

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



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

(EDGEMONT 1:125000)

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

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

TRUE NORTH
MAGNETIC NORTH
14°
APPROXIMATE MEAN DECLINATION, 1950

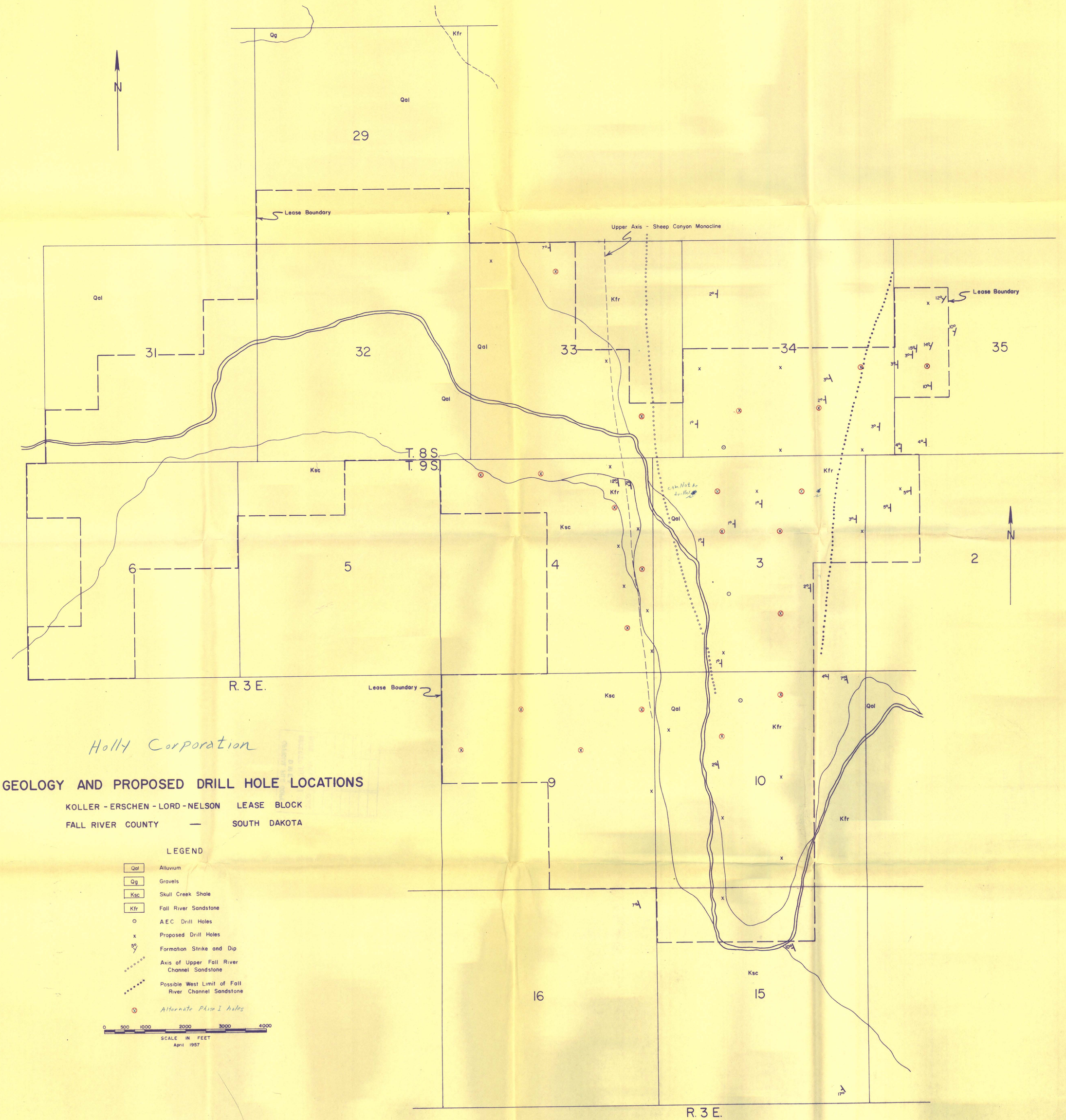
ROAD CLASSIFICATION

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

alternate phase I drill hole
lease boundary

EDGEMONT, S. DAK.
N4315—W10345/7.5
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



Holly Corporation

GEOLOGY AND PROPOSED DRILL HOLE LOCATIONS

KOLLER - ERSCHEN - LORD - NELSON LEASE BLOCK

FALL RIVER COUNTY — SOUTH DAKOTA

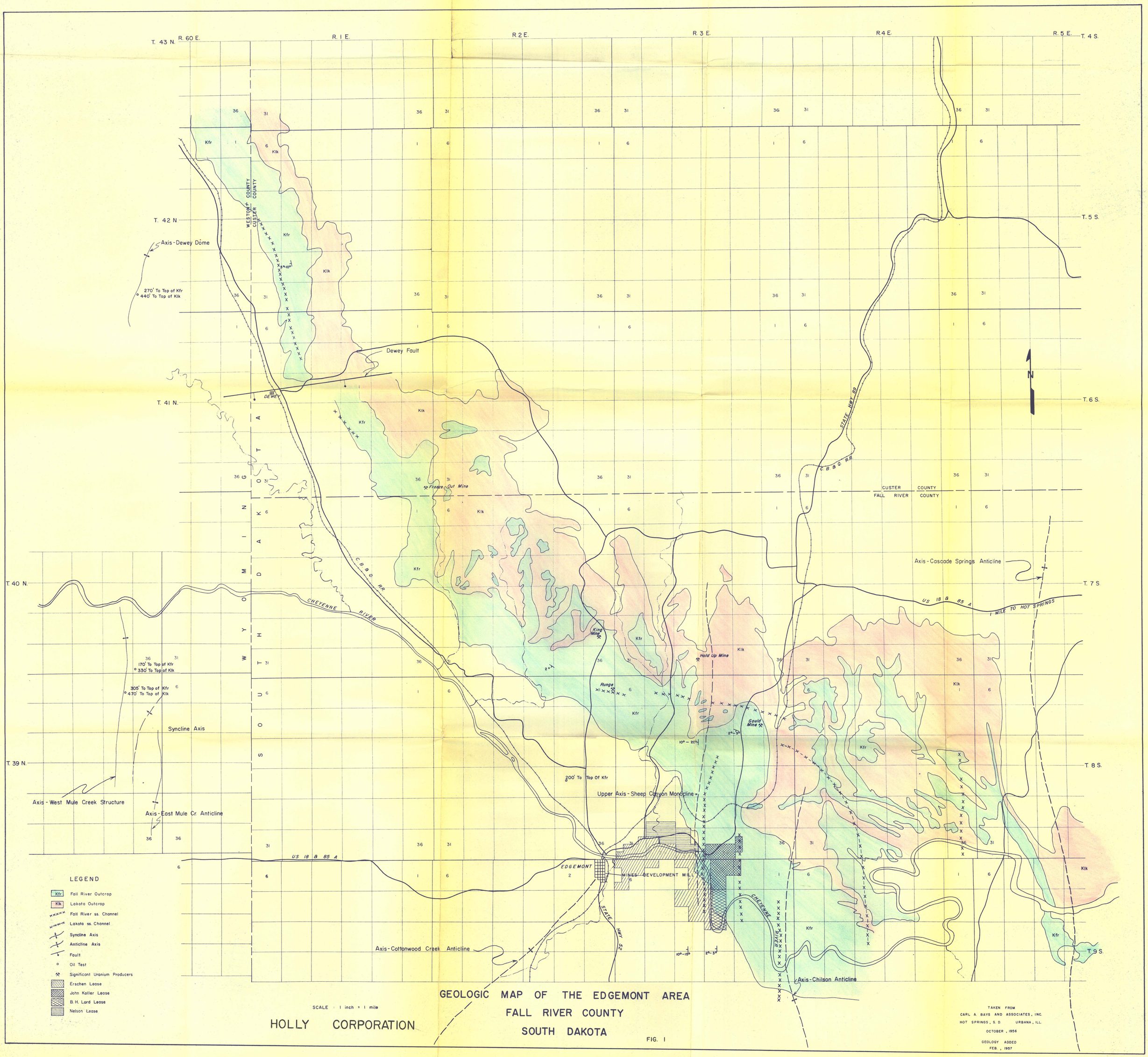
LEGEND

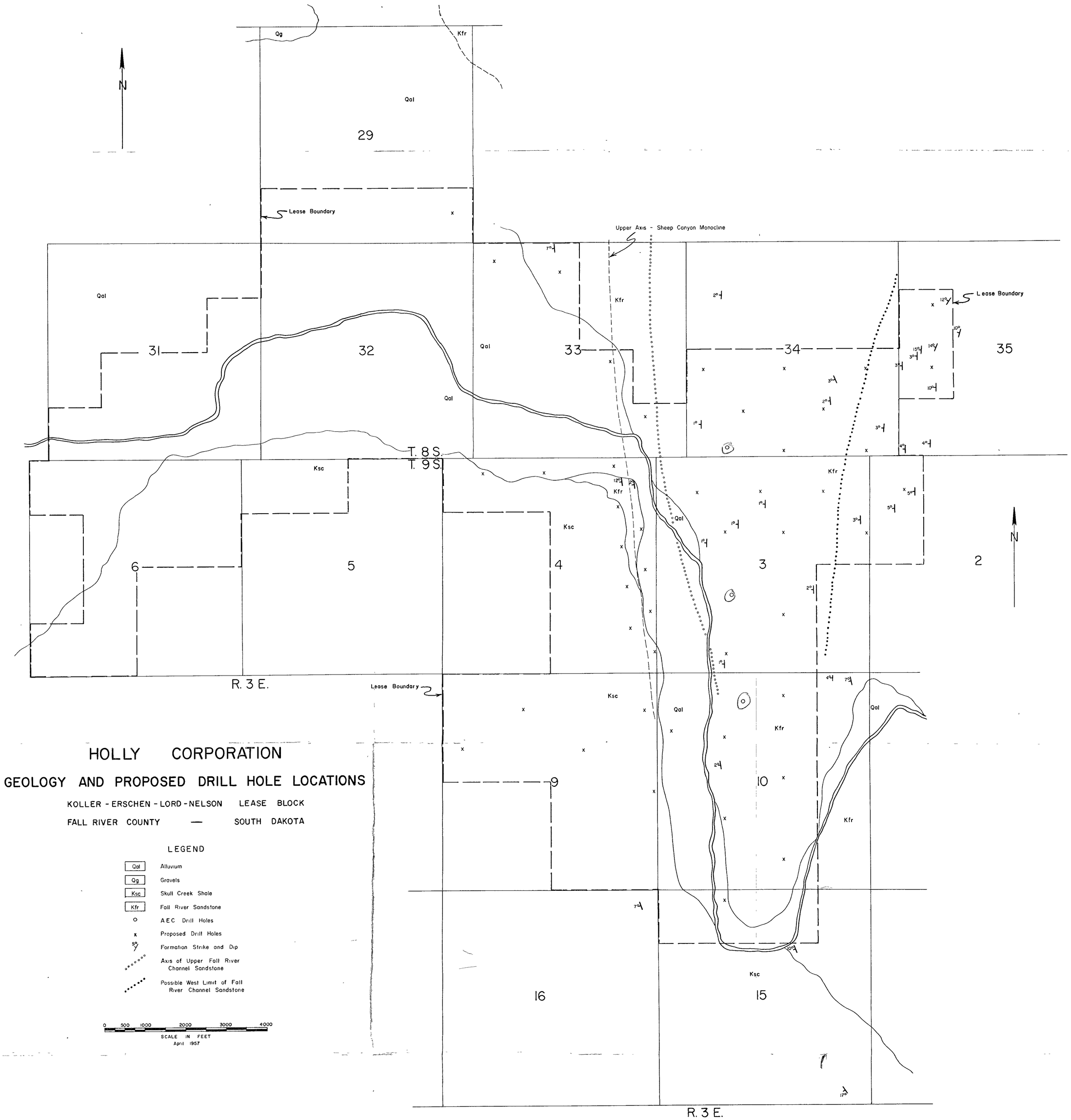
- Qal — Alluvium
- Qg — Gravels
- Ksc — Skull Creek Shale
- Kfr — Fall River Sandstone
- O — AEC Drill Holes
- x — Proposed Drill Holes
- 50 — Formation Strike and Dip
- Axis of Upper Fall River Channel Sandstone
- Possible West Limit of Fall River Channel Sandstone
- Alternate Phase I holes

0 500 1000 2000 3000 4000

SCALE IN FEET

April 1957


T. 43 N.
R. 60 E.
R. 1 E.
R. 2 E.
R. 3 E.
R. 4 E.
R. 5 E.
T. 4 S.
T. 5 S.
T. 6 S.
T. 7 S.
T. 8 S.
T. 9 S.
T. 42 N
T. 41 N.
T. 40 N.
T. 39 N.
WESTON COUNTY
CUSTER COUNTY
CUSTER COUNTY
FALL RIVER COUNTY
SOUTH DAKOTA
WYOMING
Axis-Dewey Dome
270' To Top of Kfr
440' To Top of Klk
Dewey Fault
DEWEY
Freeze Out Mine
King Mine
Hold Up Mine
Runge
Gould Mine
C.B.&Q. R.R.
CHEYENNE RIVER
STATE HWY 89
STATE HWY 52
US 18 & 85 A
1 MILE TO HOT SPRINGS
Axis-Cascade Springs Anticline
170' To Top of Kfr
330' To Top of Klk
305' To Top of Kfr
470' To Top of Klk
Syncline Axis
Axis-West Mule Creek Structure
Axis-East Mule Cr. Anticline
200' To Top Of Kfr
Upper Axis-Sheep Canyon Monocline
EDGEMONT
MINES DEVELOPMENT MILL
CHEYENNE RIVER
Axis-Cottonwood Creek Anticline
Axis-Chilson Anticline
Kfr
Klk
LEGEND
Kfr Fall River Outcrop
Klk Lakota Outcrop
Fall River ss. Channel
Lakota ss. Channel
Syncline Axis
Anticline Axis
Fault
Oil Test
Significant Uranium Producers
Erschen Lease
John Keller Lease
B. H. Lord Lease
Nelson Lease
SCALE : 1 inch = 1 mile
HOLLY CORPORATION
GEOLOGIC MAP OF THE EDGEMONT AREA
FALL RIVER COUNTY
SOUTH DAKOTA
FIG. 1
TAKEN FROM
CARL A. BAYS AND ASSOCIATES, INC.
HOT SPRINGS, S. D. URBANA, ILL.
OCTOBER, 1956
GEOLOGY ADDED
FEB., 1957



HOLLY CORPORATION

GEOLOGY AND PROPOSED DRILL HOLE LOCATIONS

KOLLER - ERSCHEN - LORD - NELSON LEASE BLOCK

FALL RIVER COUNTY — SOUTH DAKOTA

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- Qal — Alluvium
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- Kfr — Fall River Sandstone
- ○ — A E C Drill Holes
- x — Proposed Drill Holes
- 5° — Formation Strike and Dip
- Axis of Upper Fall River Channel Sandstone
- Possible West Limit of Fall River Channel Sandstone

0 500 1000 2000 3000 4000

SCALE IN FEET

April 1957

FIG. 2