DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE — Idm-E NO. 870 — DMEA NO. 3762

Application
- [ ] Denied
- [ ] Withdrawn

Contract
- [ ] Terminated - Not Certified
- [x] Terminated - Certified
- [ ] Cancelled
- [ ] Royalty Agreement

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

Folder No. 1:

Left Side

- [ ] Royalty Audits
- [x] Certification of Discovery
- [x] Closing Letter
- [x] Cost Audits
- [x] Termination Notice or Agreement
- [ ] Recision Notice
- [ ] Assignment of Contract
- [x] Contract Amendments
- [x] Contract with all exhibits and annexes
- [x] Owner's Consent to Lien and Subordination Agreement
- [x] Application and attachments

Right Side

- [x] Project summary (final)
- [x] Work Completed analysis (final)

All other material filed in chronological order including the following reports if checked:

- [x] Field Team Semi-Annual Report for Certified Project
- [x] Final Field Team Report (Tab)
- [x] Operator's Final Report (Tab) None
- [x] Interim Field Team Reports
- [x] Operator's monthly reports and all attachments
- [x] On-site Exam Report (Tab)
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No. 3 : Reports
- [ ] Analysis of Semi-Annual Inspection Reports
- [ ] Project Summary (Interim) by DMEA Engineers

Right Side

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

Folders No. 2 : Maps (Use pocket folder or envelope)

Folders No. _____ : Settlement Sheets

Folders No. _____ : Drill Logs

Folders No. _____ : Royalty material

17963

Docket copy

Murphy
F Kessler
Arthur
Dwyer
"Appd Sol. Off."
Chamberlain
Pearce
Greenland
Yager
Martin
Hyman

CERTIFICATION BY THE UNITED STATES OF AMERICA
OF A DISCOVERY OR DEVELOPMENT UNDER
AN EXPLORATION PROJECT CONTRACT

Pursuant to the provisions of Exploration Project Contract No. Idm-2870, dated September 14, 1955, (Docket No. DMEA-3762), hereinafter called the "contract," between Shannon Oil Co., a limited partnership consisting of R. S. Shannon, Jr., (general partner), and W. J. Quinlin, Kathryne E. Scoville, and Phyllis L. Warwick (limited partners), and the United States of America, hereinafter called the "Government"; to establish and fix the Government's percentage royalty on production and its lien therefor and on the land described in the contract, the Government considers and therefore certifies that discovery or development from which production may be made has resulted from the exploration work.

The nature of said discovery or development is described broadly or indicated as follows:

Core and non-core drilling under the contract intersected ore-grade uranium mineralization and consistent favorable geologic characteristics at two stratigraphic intervals in the Cretaceous Lakota sandstone underlying the subject property.

Dated: MAY 2 5 1956

THE UNITED STATES OF AMERICA

By C Mitchell Ivey
Administrator, Defense Minerals
Exploration Administration

FMMurphy/gla
5-21-56
Operator
Frank E. Laymon and
Anne M. Laymon
Contract Adm.& Audit Division
Field Team, Region III (2)
Finance Office
Rare and Misc.Metals Division
Mails and Files Docket
Admr.'s Reading File
Operating Committee
Robert W. Geehan, Rm. 3608
T. H. Kiilsgaard, Rm. 5224
F. E. Johnson
F. M. Murphy

MME Form 7
(10-58)

Belloe Mining and Development Company
P. O. Box 861
Grand Junction, Colorado

Re: IMEA-3797 (Terminated)
Shannon Oil Company
Laymon Property
Crook County, Wyoming
Contract [illegible]

and

IMEA-4289 (Terminated)
Belloe Mining and Development Company
Laymon Property
Crook County, Wyoming
Contract [illegible]

Gentlemen:

As a result of the repayment of the government's participation in $13,662.16 in the subject contracts, the Government retains no lien against the property or any further obligation. The above repayment includes the sum of $[illegible] under Contract Idm-E878 and $5,066.03 under Contract [illegible].

We appreciate your interest and participation in the IMEA exploration program.

Sincerely yours,

Director

Copy to:
Shannon Oil Co.
603 Midland Savings Building
Denver 2, Colorado

Frank E. Laymon and Anna M. Laymon
584 East 8th Street, Sheridan, Wyoming
Edwin F. Thorn, Sundance, Wyoming
R. S. Shannon, Jr., Shannon Oil Co.
603 Midland Savings Building, Denver 2, Colo.
Paul S. Postmeller, Vice President, Fremont Petroleum Company
824 Equitable Building, Denver 2, Colorado
Marvin L. Laymon, 953 Avon Street, Sheridan, Wyoming

FMMurphy/als 1-17-62
cc to: Director's Reading File
Frank E. Johnson
Div. of Contract Adm. and Audit
Region III (2)
Docket
Code 500

JUN 19 1959
O.M.E.

OFFICE OF MINERALS EXPLORATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF ROYALTY REVIEW

I have reviewed the files of the Executive Officer, OME Field Team, Region III, Denver, Colorado pertaining to Contract Idm-8870, Docket No. DMEA 3762, dated September 14, 1955, with

Shannon Oil Company, a limited Partnership consisting of R. S. Shannon, Jr. (General Partner) and W. J. Quinlin, Kathryne E. Seoville, and Phyllis L. Warrick (Limited Partners)
603 Midland Savings Building
Denver 2, Colorado

for the purpose of determining the amount of royalties due the U. S. Government on the sales of Uranium, from property referred to as Laymon Lease, located in Crook County, Wyoming, during the period September 14, 1955 to June 16, 1959.

A Certification of Discovery or Development was issued on May 25, 1956, and accordingly royalty is payable on all the production from the land described in Article 2 of the contract for a maximum period of 10 years from the date of the contract. A Report of Review in lieu of Final Cost Audit dated August 28, 1956, indicated accepted costs under the exploration contract of $11,461.51, with the Government's contribution on a 75 percent basis being $8,596.13.

No royalty has been paid to the Government to date in connection with this contract.

This review was made in lieu of an on-site audit of the Operator's accounts and records for the following reasons:

(a) According to the Field Team's Semi-Annual Report of certified project for the period July 1, to December 31, 1956, operation ceased about November 25, 1955; no ore has been shipped since September 14, 1955, (The date of the exploration contract). Subsequent semi-annual reports of Field Team during the period January 1, 1957 to December 31, 1958, indicate property inactive and no operations or ore shipments are anticipated in 1959.

(b) The administrative costs to the Government of an on-site royalty audit at this time would be excessive in relation to the amount of possible royalty which might be disclosed.

June 16, 1959

Donald T. Finch
Donald T. Finch
OME Auditor

8/31/56

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF REVIEW

I have reviewed the Monthly Reports of:

Shannon Oil Co., a limited partnership consisting of R. S. Shannon, Jr. (general partner) and W. J. Quinlin, Kathryne E. Scoville, and Phyllis L. Warnick (limited partners)
603 Midland Savings Bldg
Denver, Colorado

pertaining to Exploration Project Contract No. Idm-2870, Docket No. DMEA-3762, including Amendment No. 1 for the period October 18, 1955 to November 25, 1955, covering a project for the exploration of Uranium on property known as Laymon Lease located in Crook County, Wyoming.

My review included an examination of the Monthly Reports (Form MF-104) and supporting documents attached thereto, comparison of the costs claimed with the contract and pertinent schedules, consultation with the Executive Officer, DMEA Field Team, and a determination of the reasonableness and propriety of the costs.

This review was made in lieu of a final audit of the Operator's accounts and records for the following reasons:

(a) the administrative cost to the Government of an audit would be excessive in relation to the estimated amount of possible disallowances thereunder;

(b) the Monthly Reports were supported by documentary proof of the costs claimed under the contract provisions for contribution by the Government on the basis of actual costs incurred;

(c) a major portion of the costs ($8,850.05) incurred covered work performed at unit rates under independent contract; and

(d) the balance ($2,611.46) of the costs incurred were under a contract provision for payment by the Government on the basis of fixed unit costs for work actually performed.

The review disclosed the following facts in regard to the amount paid or to be paid the contractor:

Total cost as billed by Contractor		$11,940.92
Exceptions:		
By DMEA Finance Officer	$479.41	
Herewith	0.00	479.41
Total Accepted Cost		$11,461.51

The contract calls for a 75% participation of exploration expenses by the United States Government. Therefore, payment to the contractor by the Government in the amount of Eight thousand, five hundred ninety-six and 13/100ths Dollars

** $8,596.13 **

is considered valid and proper, provided that the Regional Executive Officer, the Administrator, or other competent official has accepted or will accept the project as having otherwise met the terms of the contract.

August 28, 1956

T. H. Brading, Auditor

Audit Report of Review

SCHEDULE OF EXCEPTIONS

SHANNON OIL COMPANY

Contract Idm-E870 | Docket No. DMRA-3762

The contract provides that only two of the four holes offsetting Hole No.753 shall be drilled below the upper ore bearing unit of Lakota formation. All four holes were drilled through the lower ore bearing unit, resulting in an excess of 13 feet on Hole No. 735-1 and an excess of 12 feet on Hole No. 735-3.

1.	Total excess 25 feet at $3.50 per foot is disallowed, or	$ 87.50
2.	141 feet were drilled below ore bearing units in Holes Nos. 735-1 & 735-3 12 " " " " " " " " " " 735-2 & 735-4 153 feet in excess of contract allowance at $1.75 per foot	267.75
3.	Incidental allowance on above listed 178 feet at 57¢ per foot	101.46
4.	Radiometric logging allowance for 177 feet at 10¢ per foot (One foot was not logged.)	17.70
5.	Cost of one chemical analysis at $5.00 (Sample No. 5406-9 Hole 735-1)	5.00
	Total Disallowed	$479.41

Above disallowances were made by Finance Officer, and after checking, are approved by Auditor.

Docket Copy

Robin Sawyer
AUG Sol. Off.

Murphy
Ellis
Chambers
Martin
Hoffman
Motheadorf

TERMINATION AGREEMENT

It is agreed this 20th day of August, 1956, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and Shannon Oil Company, hereinafter called the "Operator," parties to that certain Exploration Project Contract Idm-E870, Docket No. DMEA-3762, dated September 14, 1955, as amended, hereinafter called the "Contract," that:

1. Effective May 25, 1956, the Contract and all obligations of the parties thereunder, except as otherwise herein expressly provided, shall be and are hereby terminated.

2. The Government shall contribute to the allowable costs incurred prior to said effective date.

3. All rights of the Government provided for in the Contract with respect to a certification of discovery or development and a percentage royalty and liens for its payment are preserved.

4. All rights of the Government under the Contract with respect to records, audits, and recovery of any overpayment are preserved.

5. The Operator hereby releases and agrees to save the Government harmless from all claims or demands under or arising out of said Contract, except as otherwise provided in this termination agreement.

IN WITNESS WHEREOF, these parties have executed this agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA

By W. M. Weaver
Executive Officer
DMEA Field Team, Region III

SHANNON OIL COMPANY

By R. S. Shannon Jr.

GENERAL PARTNER

DOCKET COPY

RECEIVED
FEB 13 1956

Rufus Bergen
Appl. Col. Off.
Murphy
Ellis
Jackson
Selfridge
Johnson
Mattendorf

AMENDMENT NO. 1
to
EXPLORATION PROJECT CONTRACT Idm-E870
Dated September 14, 1955
DOCKET NO. DMEA-3762
between
THE UNITED STATES OF AMERICA
and
SHANNON OIL CO.

It is agreed this 9th day of February, 1956, that the Contract is amended as follows:

1. Work under the Contract shall be suspended during the period beginning November 26, 1955, and ending not later than May 1, 1956.

2. No costs incurred by the Operator during the period of suspension shall be allowable for contribution by the Government, and the Government shall not contribute to any costs of rehabilitation or repair which, in its opinion, would not have occurred if there had been no suspension of the work.

3. The Operator at its own cost and expense, without contribution by the Government, during the period of suspension shall preserve and protect the project work and any property in which the Government has an interest.

This agreement shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may be required to contribute, nor the amount of any item designated as maximum.

Executed in sextuplicate the day and year first above written.

SHANNON OIL CO.

By R. S. Shannon Jr.

GENERAL PARTNER

THE UNITED STATES OF AMERICA

By W. M. Nancy
Executive Officer
DMEA Field Team, Region III

Docket copy

RECEIVED
SEP 26 1955

MF-200
(Revised June 1954)

Docket No. DMEA 3762

Commodity Uranium

Contract No. Idm-E 870

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

EXPLORATION PROJECT CONTRACT[1]

It is agreed this SEP 14 1955 day of ....., 195...., between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and [2] Shannon Oil Co., a limited partnership consisting of R. S. Shannon, Jr., (general partner), and W. J. Quinlin, Kathryne E. Scoville, and Phyllis L. Warwick (limited partners),
whose mailing address is 603 Midland Savings Bldg.
Denver 2, Colorado,
hereinafter called the "Operator," as follows:

ARTICLE 1. *This contract* is entered into under the authority of the Defense Production Act of 1950, as amended. It consists of this form (MF-200), the attached Exhibit "A," Annex I, and map, Figure 5.

The Operator shall not transfer or assign this contract or any right thereunder without the written consent of the Government.

ARTICLE 2. *Operator's property rights.*—(a) The land which is the subject of this contract (hereinafter called "the land") is in the State of Wyoming, County of Crook, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] lessee of [5] the surface and mineral rights in the land, in possession and entitled to possession for all of the purposes of this contract, under and by virtue of a [6] ....., [7] ....recorded in Book ....., page ....., official records of said County; and

(2) The Operator's right, title, or interest (whether as owner, lessee, or otherwise) is subject only to the following claims, liens, or encumbrances: 1½ percent royalty interest held by owner of surface rights.

(c) The Subordination Agreement of the holder of any claim, lien, or encumbrance listed above, and (if the Operator does not hold the legal title) the Consent to Lien of any holder of the legal title

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] Insert name, and if an organization, its nature (corporation and place of incorporation, partnership with names of partners, etc.).
[3] State on a separate sheet marked "Annex I" the legal description or enough to identify the property, particularly excluding any areas from which the production is not to be subject to the Government's percentage royalty.
[4] Insert "owner," "lessee," "contract purchaser," "locator," etc.
[5] Insert "the entire interest," "the mineral rights," "an undivided one-third," etc.
[6] Insert "deed," "lease," "contract," "location notice," "patent," etc.
[7] If not recorded, so indicate by inserting "un."

of the land (lessor, seller, optionor, etc.), are attached, as follows: Consent to Lien of lessor of mineral rights. (Consent to Lien of lessor of surface rights is waived.)

(d) The Operator shall preserve and maintain his right, title, and interest in the land and his right to the possession thereof for the purposes of this contract, and shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of this contract. Until the lapse of the time within which the Government may make a certification of discovery or development without any such certification having been made, and after any such certification has been made, the Operator shall neither transfer, convey, nor surrender the land nor any right, title, or interest therein, nor permit nor suffer any claim, lien, or encumbrance thereon, without expressly referring to and providing in the instrument of conveyance, lien, or encumbrance for the preservation of the Government's right to a percentage royalty on production and lien for the payment thereof. If the Government makes no certification of discovery or development within the time limited in Article 8, it shall thereafter have no claim against the land or any production therefrom except for any production referred to in Article 8(b)(1).

ARTICLE 3. *The exploration project.*—The project is a search for indicated or undeveloped deposits of Uranium The work to be performed is described in Exhibit "A." The Operator on or before October 31, 1955 shall commence the work, and on or before September 1, 1956 (unless the Operator's obligation to prosecute the work is terminated—see Article 10) shall either have completed the work or shall have incurred allowable costs (see Article 6) in a sum not less than the estimated total allowable cost set forth in Exhibit "A." except as otherwise provided in Exhibit "A" with respect to Stages of work.

ARTICLE 4. *Performance of the work.*—(a) *Operator's responsibility.*—The work shall be performed with reasonable diligence, efficiently, expertly, in a workmanlike manner, in accordance with good mining standards and State regulations for health and safety and for liability insurance covering employment; and with suitable and adequate equipment, facilities, materials, supplies, and labor, to bring it to completion within the time fixed.

(b) *Independent contracts.*—To the extent that the allowable costs are estimated in Exhibit "A" with express reference to performance by independent contractors on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations), the work may be so performed; but if the reference in Exhibit "A" to any such independent contract requires the Government's approval thereof, payments under such contract will not be allowable costs unless the Government gives its written approval of the contract. Any such independent contract shall refer to some specific and identifiable part of the work, and shall be subject to all of the pertinent terms and conditions of this exploration contract; but the Government shall not be considered a party thereto, and its rights under this contract, including the right to terminate its contributions, shall not be affected thereby. Regardless of the provisions of any such independent contract and regardless of the Government's approval thereof, the Government will participate in payments to the independent contractor only on account of work performed in accordance with the provisions of this exploration project contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable.

(c) *Government may inspect.*—The Operator shall consult with and inform the Government on all phases of the work as it progresses. The Government may enter at all reasonable times to inspect the work under the contract, and also after a certification of discovery or development to inspect production operations and underground workings. The operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 5. *Contribution by the Government.*—The estimated total allowable cost of the project, set forth in Exhibit "A," is the sum of $59,360.00 The Government shall contribute 75 percent of the allowable costs as they are incurred in a total sum not in excess of $44,520.00: *Provided,* That until the Operator has rendered to the Government his final report, and any final auditing required by the Government has been made, and a final settlement of the contract has been made, the Government may withhold from the last

voucher or vouchers such sums as it sees fit not in excess of 10 percent of the estimated total cost of the work or not in excess of the amount of the Government's contribution to the cost of property which is or may become subject to disposal as provided in Article 9(c), whichever is greater. The Government will make its contribution on the basis of the monthly vouchers referred to in Article 7(b), but all payments by the Government are provisional only, subject to audit, until the account between the Operator and the Government is finally audited and settled. "Costs incurred" mean costs that have been paid or have become due and payable, or that in the opinion of the Government have become an obligation. The Government may make payments directly to independent contractors and suppliers for the account of the Operator rather than to the Operator.

ARTICLE 6. *Estimated costs.*—(a) *Categories of costs.*—The allowable costs of the work to which the Government shall contribute are limited to those that are direct, reasonable, necessary, and that are estimated in Exhibit "A" by categories as specified in this article. If any category or subcategory is omitted from the estimate of costs, or if the word "none" is annexed to the listing thereof, costs under such category or subcategory are not allowable. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost, and any excess over the estimated total allowable cost of the work, shall not be allowable. Any excess over the estimate of any category, subcategory, or item, either as to requirement or related cost, not indicated as a maximum shall be allowable within the limit of the estimated total allowable cost of the work. To the extent that excesses over maximums other than the estimated total allowable cost of the work may be necessary for the performance of the work, the Operator shall incur such excesses for his own account without contribution by the Government; but except for any such necessary excesses in categories, subcategories, or items thereunder the Operator is not obligated to incur more than his agreed percentage of the estimated, total allowable cost of the work.

To the extent specified in this article or in Exhibit "A" the following categories, subcategories, and elements thereof are maximums; but if not so specified either here or in Exhibit "A" they are not maximums, and may be exceeded within the limit of the estimated total allowable cost of the work:

CATEGORY (1)—INDEPENDENT CONTRACTS.—Work to be performed under independent contracts (see Article 4(b)). The estimated total amount of this category and the estimated cost of each unit of work for performance under an independent contract are maximums.

CATEGORY (2)—PERSONAL SERVICES.

Subcategory (a)—Supervision.—All elements of this subcategory (number of supervisors, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)—Technical services.—All elements of this subcategory (number of technicians, periods of employment, rates of pay, and total) are maximums.

Subcategory (c)—Labor.

CATEGORY (3)—OPERATING MATERIALS AND SUPPLIES.—Includes such items as drill bits and steel, explosives, fuel, pipe, power, small tools costing less than $50 each, timber, track.

CATEGORY (4)—OPERATING EQUIPMENT.

Subcategory (a)—Rental.—The number of each object to be rented [6 mine cars, 1 truck], the rate of rental [$100 per month, $5 per hour], and the total of this subcategory are maximums.

Subcategory (b)—Purchases.—The estimated total of this subcategory is a maximum.

Subcategory (c)—Depreciation.—All elements of this subcategory (time periods, rate of depreciation, and subcategory total) are maximums.

CATEGORY (5)—INITIAL REHABILITATION AND REPAIRS.—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

Subcategory (a)—Initial rehabilitation and repairs of existing buildings, fixtures, and installations (exclusive of mine workings).—The estimated total of this subcategory is a maximum.

Subcategory (b)—Initial rehabilitation and repairs of operating equipment.—The estimated total of this subcategory is a maximum.

CATEGORY (6)—NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

CATEGORY (7)—MISCELLANEOUS.—Repairs and maintenance (other than initial) of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, communications, and any other items of requirement or cost that do not fall within any of the first 6 categories.

THE ESTIMATED TOTAL ALLOWABLE COST of the work is a maximum.

(b) *Nonallowable costs.*—The following costs are not allowable for contribution by the Government:

(1) *Costs of the land,* such as rental, depreciation, depletion, or other cost of acquiring, owning, or holding possession;

(2) *Indirect costs,* such as general overhead, corporate management, interest, taxes (other than payroll and sales taxes), insurance (other than liability insurance covering employment), damages to persons, damages to property (other than necessary repairs or replacements of equipment or other property used in the work);

(3) *Previous work* performed or costs incurred before the date of this contract; and

(4) *Deferred payments.*—Any costs incurred by the Operator under any rental-purchase agreement, installment-purchase agreement, or any agreement for the purchase of goods under the provisions of which payment of the full purchase price is deferred more than 90 days from the delivery of the goods; unless the purchase agreement is approved by the Government in writing.

(c) *Reductions in costs.*—The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original estimated total cost. This provision does not apply to receipts from production which are subject to the Government's percentage royalty under the provisions of Article 9. And see Article 13.

ARTICLE 7. *Reports, accounts, audits.*—(a) *Operator's records.*—The Operator shall keep suitable records and accounts of the work performed and of any production in which the Government may have an interest; and shall preserve those with respect to work performed for at least three years after final payment by the Government, and those with respect to production for at least three years after any obligation to pay royalties to the Government has terminated. The Government may inspect and audit said records and accounts at any time, either by itself or by a certified public accountant. If the Government elects to audit said records and accounts relating to the exploration work by certified public accountant, it may do so as a cost of the work to which the Operator shall contribute. The Comptroller General of the United States or his representative, until the expiration of said three-year periods, shall have access to and the right to examine any pertinent books, documents, papers, and records of the Operator. All of the Operator's vouchers and records and accounts relating thereto and the Government's payments thereof remain subject to adjustment until final audit by the Government. If work under this contract is carried on in conjunction with any other operations, or if labor, supervision, services, materials, supplies, equipment, facilities, or other requirements for carrying on the work are also used in connection with other operations, the costs shall be segregated and accounted for on a basis and by methods and accounts that are satisfactory to and approved by the Government.

(b) *Progress reports and vouchers.*—The Operator shall provide the Government with five copies of monthly progress reports in three sections as follows: (1) Operator's Monthly Report and Voucher showing detailed costs incurred during the reporting period; (2) Operator's Unit Cost and Progress Report showing the various types of work performed during the reporting period and costs incurred for each type of work; and (3) a Narrative Report of the work performed during the reporting period including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground. (Forms for reporting under (1) and (2) above will be provided by the Government.)

(c) *Final report.*—Upon completion of the work or termination of the Government's obligation to contribute to costs, the Operator shall furnish the Government with five copies of a final report (in addition to the final progress report and voucher). This final report shall include a geological and engineering evaluation of the results of the work performed under the contract with an estimate of the ore reserves resulting from such work, complete assay data, adequate geological and engineering maps or sketches, and a summary of the work performed and related costs incurred.

(d) *Report of sales.*—The Operator shall provide the Government with suitable accounting and documentary evidence covering all production to which the Government's percentage royalty relates, such as copies of smelter or concentrator settlement sheets, and certified accounts of production and sale or other disposition of production.

(e) *Compliance with requirements.*—If in the opinion of the Government any of the Operator's reports, records, or accounts are insufficient or incomplete, or if the Operator fails to make them, the Government may procure the making or completion of such with suitable attachments as an expense of the work to which the Operator shall contribute. The Government may withhold approval and payment of any vouchers relating to insufficient or incomplete reports, records, or accounts.

ARTICLE 8. *Repayment by Operator.*—(a) *Certification.*—If the Government considers that a discovery or development from which production may be made has resulted from the work, the Government, at any time not later than six months after a sufficient final report and final account (see Article 7) has been rendered, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

(b) *Royalty on production.*—The Operator, as principal if the Operator is the producer, or as surety if the Operator is not the producer, shall pay to the Government a royalty on all minerals mined or produced from the land, as follows: (1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first; or (2) if the Government makes a certification of discovery or development, within a period of ten years from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first.

(c) *Basis for computation.*—The Government's royalty shall be a percentage of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrates, metal, or equivalent), at the point of delivery (the f. o. b. point); *except,* that charges of *the buyer* arising in the regular course of business, and shown as deductions on the buyer's settlement sheets, on account of the cost of treatment processes performed by *the buyer,* sampling and assaying to determine the value of the production sold, and freight paid by *the buyer* to a carrier (not the Operator), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. Any costs of treatment processes, sampling or assaying, or transportation, performed or paid by the Operator or by anyone other than the buyer, are not deductible in arriving at the "gross proceeds" as that term is here used. The term "treatment processes," as here used, means those processes (such as milling, concentrating, smelting, refining, or equivalent) applied to the crude ore or other production after it is extracted from the ground, to put it into a commercially marketable form; excluding fabricating or manufacturing.

(d) *Unsold production.*—If any production (ore, concentrates, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used by the Operator in integrated manufacturing or fabricating operations (for instance, if it is stockpiled), the Government, at its option, as long as it so remains, may require the computation and payment of its royalty on the value of such production in the form (ore, concentrates, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used by the Operator in integrated manufacturing or fabricating operations before the Government makes its election, the Government's royalty on such production shall be computed on the value therof in the form in which and at the time when it is so used. "Value" as here used means what is or would be gross income from mining operations for percentage depletion purposes in Federal income tax determination, or the market value, whichever is greater.

(e) *Percentages of royalty.*—The percentages of the Government's royalty shall be as follows:

One and one-half (1½) percent of amounts ("gross proceeds" or "value") not in excess of eight dollars ($8.00) per ton of production in the form in which sold, held, or used, plus one-half (½)

percent for each additional full fifty cents ($0.50) by which such amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such amounts.

(For instance: the royalty on an amount of five dollars ($5.00) per ton would be one and one-half (1½) percent; on an amount of ten dollars ($10.00) per ton, three and one-half (3½) percent.)

(f) *Time for computation and payment.*—The Government's royalty shall be computed and paid currently upon each lot sold, held, or used in integrated operations, as the case may be, as above provided in this article.

(g) *Lien for payment.*—To secure the payment of its percentage royalty, there is hereby granted to the Government a lien upon the land or the Operator's interest in the land and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(h) *Notice to purchasers.*—The Operator shall give notice of the Government's claim for royalty to any purchaser of the production, and shall authorize and direct such purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets. If the records of any production and sales or other disposition of production, whether the production is by the Operator or by others, are not made available to the Government, the amount of the royalty may be estimated by the Administrator, Defense Minerals Exploration Administration, or his successor, and his estimate thereof shall be final and binding upon the Operator.

(i) *No obligation to produce.*—Nothing in this contract is to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

(j) *Government not obligated to buy.*—Nothing in this contract shall be construed as imposing any obligation on the Government to purchase any minerals mined or produced from the land.

ARTICLE 9. *Interests in purchased property.*—(a) *Title and ownership.*—All costs under this contract shall be incurred by the Operator in the Operator's own name and for the Operator's own account; but any property acquired to the cost of which the Government contributes shall belong to the Operator and the Government jointly in proportion to their respective contributions, although title thereto shall be taken in the name of the Operator.

(b) *Preservation of property.*—Until the final disposal of any property in which the Government has an interest the Operator shall preserve and protect same for the best interest of the Government, any reasonable and necessary costs thereof to be treated as an allowable cost of the project. After the completion of the work or termination of the Government's obligation to contribute, or when such property is not in use for or needed for the work, the Operator shall neither use it without the written consent of the Government nor without paying a reasonable rental to be fixed by the Government for its interest.

(c) *Disposal of property.*—Upon the completion of the work or termination of the Government's obligation to contribute to costs, or when the property is no longer needed for the work, the Operator shall promptly dispose of salable or salvageable property in which the Government has an interest for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator or the Government at a price at least as high as could be obtained from others, unless the Government in writing waives its interest in any such property. Without advance approval of the sales price by the Government the Operator shall not sell at any price any item of property the cost of which was more than $500, and shall not sell at less than 25 percent of the purchase price any item of property which cost $500 or less. The Government, in lieu of approving the sales price for any such item, may itself purchase the item at the best price which the Operator is able to obtain or himself cares to give. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, or explosives, or pipe, or rails), and if the original cost of the remaining unexpended portion of any such group or category is less than $50, the Government waives its interest therein. If necessary to accomplish the disposal of any item the Operator shall dismantle and sever it from the land, the cost thereof to be treated as a cost of the project.

(d) *Default of the Operator re disposal.*—If within 90 days after the completion of the work or termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, or after such further time as the Government may in writing allow, the Operator has failed to sell or otherwise liquidate or dispose of any property in which the Government has an interest, the Government, at any time prior to final settlement under the contract, may pursue one of the following two courses: (1) the Government, by written notice to the Operator, may place upon such property what in its opinion is a fair valuation thereof, not in excess of the cost less 1.66 percent per month from the

date such property was purchased under this contract to the termination of said 90-day period; and such property shall thereupon be considered and accounted for as having been purchased by the Operator at the valuation so fixed by the Government; or (2) the Government may enter and take possession of such property wherever it may be found, and remove and dispose of it for the joint account of the parties.

ARTICLE 10. *Termination of the Government's obligations.*—(a) If in the opinion of the Government operations at any time have failed to achieve anticipated results that indicate the probability of making a worthwhile discovery, and in the opinion of the Government further operations are not justified, the Government may give the Operator written notice thereof, and thereupon: (1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting.

(b) If in the opinion of the Government the Operator is in any manner in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon: (1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting. The remedy provided for the Government in this paragraph "(b)" is in addition to any other remedy provided in this contract, and in addition to any other remedy the law may provide for breach of contract.

(c) The giving of any notice by the Government under the provisions of this Article 10 shall not affect the Government's rights as provided for in the contract with respect to a percentage royalty, and such rights shall be fully preserved.

ARTICLE 11. *Notices to be given by the Government* may be delivered to the Operator, or may be sent by registered mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 12. *Officials not to benefit.*—No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 13. *Changes and added provisions.*—

To the extent that costs are set forth in Exhibit "A" as "Fixed Unit Costs" they are in lieu of the actual costs that otherwise would be allowable under Article 6 of the contract form. The Government will contribute to the Fixed Unit Costs as they accrue for units of work actually performed. The Fixed Unit Cost includes all costs whatsoever necessary to complete the work.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By O. Mitchendorf
Administrator, Defense Minerals
Exploration Administration

SHANNON OIL CO.
(Operator)

By R. S. Shannon Sr.
By (GENERAL (partner)
(partner)

By
(partner)

By
(partner)

"Appd. Sol. Off."

I, ..., certify that I am the ..... secretary of the corporation named as Operator herein; that ..... who signed this contract on behalf of the Operator, was then ..... of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

.....

[CORPORATE SEAL]

U. S. GOVERNMENT PRINTING OFFICE 16—70617-1

RECEIVED
SEP 26 1956

EXPLORATION PROJECT CONTRACT
SHANNON OIL COMPANY
DOCKET NO. DMEA-3762

ANNEX I

The land referred to in Article 2 of the contract form consists of 160 acres, more or less, situated as follows:

The E ½ of the N W ¼ and the W ½ of the N E ¼ of section 27, T. 52 N., R. 66 W., 6th P. M., Crook County, Wyoming.

RECEIVED
SEP 26 1955

EXPLORATION PROJECT CONTRACT
SHANNON OIL COMPANY
DOCKET NO. DMEA-3762

EXHIBIT "A"

Description of the Work

The object of this project is to explore both the upper and the basal uranium-bearing units of the Cretaceous Lakota sandstone formation by means of drilling. It is estimated that drill holes averaging 205 feet in depth will be required to penetrate the upper ore-bearing unit, and drill holes 270 feet in depth will be required to explore the basal unit.

The work is divided into three stages. The Operator shall perform all the work under Stage I, and shall perform so much of the work set forth under the succeeding stages as is approved in advance in writing by the Government.

STAGE I

Stage I consists of bulldozing access roads, preparing eighteen (18) drill sites, and drilling 18 holes. A group of four offset holes shall be drilled around each of AEC drill holes nos. 708, 735, 743, and 746 at points approximately 50 feet northeast, approximately 50 feet southeast, approximately 50 feet northwest, and approximately 50 feet southwest of each hole. Two holes of each group of four offset holes shall be drilled through the upper ore-bearing unit of the Lakota formation only, and the other two shall be drilled to penetrate through both the upper and the basal ore-bearing units.

In addition, two holes shall be drilled through the basal Lakota unit, one at a location approximately 50 feet northeast and another approximately 50 feet southeast of AEC drill hole no. 704.

The approximate locations of the drill holes, under this stage, are shown on the attached map, Figure 5, entitled "SHANNON OIL CO. LEASE, Layman Property, Crook Co., Wyo., Docket 3762."

It is estimated that 3,600 feet of non-core drilling and 940 feet of core drilling will be required to complete the 18 holes authorized for Stage I. However, if the drill footage estimated for Stage I drilling is not sufficient to complete the eighteen (18) holes, then with prior written Government approval, a part of the footage authorized for Stage II may be used to complete the Stage I drilling.

Not in excess of 16 hours of bulldozing shall be performed under this stage, and not in excess of 90 samples shall be taken and chemically analyzed for U_3O_8 and V_2O_5 content.

STAGE II

Stage II consists of bulldozing access roads, preparing not to exceed forty-two (42) drill sites, and drilling not to exceed 42 holes. The approximate locations of the drill holes are shown on the attached map.

No hole drilled under this Stage II shall be closer than 100 feet to any other drill hole.

Not to exceed 22 holes shall be drilled to penetrate only the upper ore-bearing unit of the Lakota formation, and not to exceed 20 holes shall be drilled to penetrate both the upper and basal ore-bearing units. Not to exceed 8,400 feet of non-core drilling and 2,060 feet of core-drilling shall be performed under this stage.

Not to exceed 8 hours of bulldozing shall be performed, and not to exceed 210 samples shall be chemically analyzed for U_3O_8 and V_2O_5 content.

STAGE III

Stage III consists of drilling not to exceed twenty (20) holes, aggregating not to exceed 4,000 feet of non-core drilling and 1,400 feet of core drilling, to further delineate ore-bearing structures discovered in the preceding stages. No hole drilled under this stage shall be closer than 50 feet to or farther than 125 feet from any other drill hole.

Under this Stage III not in excess of 100 samples shall be chemically analyzed for U_3O_8 and V_2O_5 content.

GENERAL PROVISIONS

1. A supervisor and one helper shall be employed full time under this contract.

2. All holes shall be logged and probed for radioactivity, and records of such logging and probing, together with assay certificates, shall be submitted with the Operator's monthly progress report.

3. The Government will not contribute to the cost of any incompleted hole, to the cost of any hole that bottoms less than AX core size, or to the cost of any hole that cannot be probed with radiometric logging equipment.

4. No hole under this contract shall be drilled closer than 100 feet to the outer boundaries of the land described in Annex I.

5. Mineralized portions of the core shall be split and the Operator shall use one-half for assay purposes. The other half of the core shall be stored for Government use with the rest of the core in boxes properly labeled as to drill hole number. Markers shall be placed in the sections of the core to indicate the depth represented.

6. The location, inclination, direction, and extent of all work are subject to the approval of the Government.

7. Bulldozing shall be performed with D-6 bulldozer or equivalent.

ESTIMATED COSTS OF THE PROJECT

Actual Costs
(Categories 2 through 7 of Article 6(a) do not apply to this contract)

Category (1) **Independent Contracts**

Stage I

1) Access roads and drill sites 16 hours bulldozing @ $12.50/hr.	$ 200.00	
2) Non-core drilling 3,600 feet @ $1.75/ft.	6,300.00	
3) Core drilling 940 feet @ $3.50/ft.	3,290.00	
4) Radiometric logging 4,460 feet @ $0.10/ft.	446.00	
		$10,236.00

Stage II

1) Access roads and drill sites 8 hours bulldozing @ $12.50/hr.	$ 100.00	
2) Non-core drilling 8,400 feet @ $1.75/ft.	14,700.00	
3) Core drilling 2,060 feet @ $3.50/ft.	7,210.00	
4) Radiometric logging 10,460 feet @ $0.10/ft.	1,046.00	
		$23,056.00

Stage III

1) Non-core drilling 4,000 feet @ $1.75/ft.	$ 7,000.00

2) Core drilling 1,400 feet @ $3.50/ft.	$ 4,9	
3) Radiometric logging 5,400 feet @ $0.10/ft.	540.00	
		$12,4

FIXED UNIT COSTS 1/
(for all stages)

1) Incidental allowance for each foot of drilling completed, 20,400 feet @ $0.57/ft.	$11,628.00	
2) Chemical analyses for U_3O_8 and V_2O_5, 400 samples @ $5.00/each sample	2,000.00	
		$13,628.00
Estimated total cost of the project		$59,360.00
Government participation @ 75%		$44,520.00

1/ The fixed unit cost for "incidental allowance" includes all costs whatsoever that are not included in the estimates for Independent Contracts and analyses of samples, and covers such items as supervision, labor, materials and supplies, equipment, etc., which would otherwise be allowable under Categories (2) through (7) of Article 6(a) of the contract form.

MF-203
Revised March 24, 1955

RECEIVED
AUG 25 1955

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator_____
Docket No. DMEA-_____
Contract No. Idm-E_____
Contract Date_____

CONSENT TO LIEN

To the United States of America:

Referring to that certain land in the County of Crook, State of Wyoming, described as ~~[illegible]~~

In lease dated September 10, 1954 and recorded in Book 15 Photos Page 228 official records of said County

which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby—

1. Undertakes and agrees that property in which the Government may acquire an interest or equity under the contract may be dismantled, severed from the land, and removed, as may be provided in the contract; and the Government's interest and equity in such property shall be prior and superior to any adverse right or claim of the undersigned;

2. Grants to the Government a lien upon all of the undersigned's right, title, and interest in the land and upon any production of minerals therefrom to secure the payment to the Government of a percentage royalty on production as may be provided for by the contract;2/ and represents and undertakes that there are no claims, liens, or encumbrances upon the undersigned's right, title, or interest in the land prior to that hereby granted to the Government other than the following:3/

None except as conveyed to Shannon Oil Co. in above lease.

3. Undertakes and agrees neither to commit any act nor assert any claim in conflict with the provisions of this Consent to Lien; and to give advance notice of the Government's rights under this Consent to Lien to any subsequent transferee, mortgagee, encumbrancer, or lessee of any of the undersigned's right, title, or interest in the land; and

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

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

3/ Write "none" if that is the case. Do not leave lines blank.

4. Consents to all amendments and assignments of the contract without notice thereof, and agrees that this Consent to Lien shall extend and apply thereto.

5. Added provision: _____

Dated this 23 day of August, 1955.

Frank E. Laymon [Seal]
Frank E. Laymon

Anna M. Laymon [Seal]
Anna M. Laymon

_____ [Seal]

I, _____ certify that I am the _____ (Secretary, etc.) of the corporation named herein; that _____ who signed this agreement was then _____ (President or Vice-President, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

_____
[Corporate Seal]

CERTIFICATE OF LIMITED PARTNERSHIP

(In certain States called Special Partnership)

Of

SHANNON OIL CO.

This is to certify that the undersigned,

R. S. Shannon, Jr., of Denver, Colorado,

W. J. Quinlin, of Denver, Colorado

Kathryne E. Scoville, of San Francisco, California,

Phyllis L. Warnick, of San Francisco, California,

desiring to form a limited partnership under the laws of the State of Colorado, have formed a limited partnership and in that respect have agreed and do mutually agree as follows:

I.

The name of the partnership shall be

SHANNON OIL CO.

II.

The character of the business shall be generally that of acquiring by purchase or otherwise, leasing, letting, owning, holding, selling, conveying, exploiting, developing, maintaining, operating, and otherwise dealing in and with lands containing or believed to contain oil, gas, petroleum, asphaltum, mineral gases, metals, ores, coal, and other minerals and mineral substances, uranium, vanadium, and other concentrates and fissionable materials; of locating, leasing, letting, controlling, developing, exploiting, equipping, buying, selling, maintaining, and operating oil wells, gas wells, and mines or rights or interest therein; of purchasing or otherwise acquiring, producing, owning, selling, or otherwise disposing of, manufacturing, reducing, refining, milling, treating, concentrating, preparing, distilling, transporting, distributing, marketing, and otherwise dealing in and with oil, gas, petroleum, gasoline, asphaltum, carbon black, and

the products and by-products thereof, and any and all other metals, ores, minerals, and mineral substances, mineral products, and by-products thereof, uranium, vanadium, and other concentrates and fissionable materials, and the products and by-products thereof; of acquiring by purchase or otherwise, constructing, leasing, letting, owning, holding, selling, mortgaging, conveying, equipping, maintaining, operating, and otherwise dealing in and with pipe lines, refineries, mines, mills, concentrating plants, processing plants, reduction plants, and any and all other machinery, appliances, and apparatus for protecting, storing, transporting, distributing, milling, processing, marketing, treating, manufacturing, distilling, refining, reducing, preparing, concentrating, or otherwise dealing in and with oil, gas, petroleum gasoline, asphaltum, carbon black, and any and all other metals, ores, coal, and other minerals, the products and by-products thereof, mineral substances, and the products and by-products thereof, uranium, vanadium, and other concentrates and fissionable materials, and the products and by-products thereof; of acquiring by purchase, lease, or otherwise and to own, hold, sell, convey, hypothecate, encumber, pledge, and otherwise deal in and with as principal, agent, or otherwise, oil, gas, and mining royalties, royalty contracts, leases, leaseholds, agreements, mining claims, rights, concessions, and privileges, and of collecting, holding, disbursing, distributing, investing, and otherwise dealing in and with royalties, overriding royalties, and royalty and overriding royalty interests; of establishing and maintaining a drilling business and of owning and operating drilling rigs, machinery, tools, and the apparatus necessary in the boring or sinking of wells for the production of oil, gas, and/or water, or for the milling, mining, processing, or concentrating of metals, ores, minerals, mineral substances, uranium, vanadium, and other concentrates and fissionable materials, or either or any of them, and the purchase and sale

of such goods, wares, and merchandise for such business; of acquiring by purchase or otherwise and to establish and conduct the business of oil well drilling contractors and mining and milling contractors and allied and interdependent lines of business and of mining, milling, drilling, boring, or otherwise developing and producing oil, gas, coal, metals, ores, or other minerals or mineral substances, uranium, vanadium, and other concentrates and fissionable materials, and to contract for the drilling of oil, gas, and/or water wells for other persons or corporations; of purchasing, taking, owning, holding, selling, leasing, dealing in, mortgaging, or otherwise encumbering, exchanging, and disposing of property of all kinds, real, personal, and mixed, improved or unimproved, developed or undeveloped, either for cash or for credit or otherwise; of investing and reinvesting any of the moneys or proceeds received from any of the partnership property in any business pursuit or enterprise; of loaning money and extending credit and taking security therefor; of encumbering, mortgaging, exchanging, leasing, and selling any and all of the partnership property, improved or unimproved, developed or undeveloped; of acquiring by purchase or otherwise the good will, rights, and property, and of undertaking the whole or any part of the assets and liabilities of any person, association, or corporation, and to pay for the same in cash or otherwise; of acquiring by purchase or otherwise shares of stock of any corporation; and in general of doing all things necessary in the discretion of the partnership to specifically carry out the purposes herein specified.

III.

The location of the principal place of business of the partnership shall be in the City and County of Denver, Colorado, until changed, but the partnership shall have the right to conduct

all or part of its business in such other places, states, and territories of the United States, District of Columbia, and foreign countries as the general partner or general partners may from time to time determine, and shall do such acts and things and file such instruments in writing as may be necessary for the partnership to conduct its business in such other places, states, territories, and counties, and in the District of Columbia.

IV.

R. S. Shannon, Jr., shall be the general partner, and R. S. Shannon, Jr., W. J. Quinlin, Kathryne E. Scoville, and Phyllis L. Warnick shall be limited partners, (under the laws of certain states known as special partners.) R. S. Shannon, Jr. and W. J. Quinlin each reside in the City and County of Denver, Colorado, and Kathryne E. Scoville and Phyllis L. Warnick each reside in San Francisco, California. No person may be a general partner who is not also a limited partner. The right is given to the partners to admit both additional general and limited partners to the partnership by writing signed by all of them.

V.

The partnership shall be effective as of the 20th day of November, 1953, and shall exist until the 20th day of November, 1993, unless sooner terminated by the agreement of the partners, general and limited, or by the retirement, death, or mental incompetency of the general partner or general partners, and upon termination each limited partner shall be entitled to receive his or her proportion of the net realizable assets of the partnership in the amount, proportionately that his or her contributed capital in the partnership bears to the whole of its then contributed capital.

VI.

The amount of capital contributed by the limited partners in cash and a description of and the agreed value of the other property contributed by each limited partner are as follows:

Name of Partner	Cash Contri-buted	Other Property Contributed	Agreed Value of other Property Contributed	Pro-portion
R. S. Shannon, Jr.	$2342.70	37,530 shares of Pioneer Oil Corporation capital stock	$75,060.00	46.85393%
W. J. Quinlin	$ 312.73	5,010 shares of Pioneer Oil Corporation capital stock	$10,020.00	6.25468%
Kathryne E. Scoville	$1562.42	25,030 shares of Pioneer Oil Corporation capital stock	$50,060.00	31.24844%
Phyllis L. Warnick	$ 782.15	12,530 shares of Pioneer Oil Corporation capital stock	$25,060.00	15,64295%
Total	$5000.00	80,100 shares	$160,200.00	100%

No additional sums of money paid into the partnership, credits for unwithdrawn net profits, or any other credits of any kind whatsoever, shall be construed to be an addition to the contributed capital set forth above unless approved by all of the limited partners, and the limited partners have not agreed to make any further contributions.

VII.

The contribution of each limited partner is to be returned only upon termination of the partnership or at such time as all of the partners, both general and limited, may agree, except as otherwise herein provided.

VIII.

In addition to the contributed capital of each limited partner, each limited partner may with the consent of the limited partner, or limited partners who is or are also a general partner or general partners pay into the partnership additional sums of money from time to time. Said additional sums of money, if any, shall be accounted for as partnership capital

separately and apart from the contributed capital of the limited partners paying in said sums. Said additional sums paid into the partnership, as herein provided, may be repayable and may bear interest payable at such times and at such rates per annum as the general partner or general partners may agree with the limited partners from whom such additional sums of money are received. The amount of interest paid or accrued as herein provided shall be a charge against the partnership profits before any distribution of partnership net profits as hereinafter provided. The general partner, or general partners notwithstanding any prior understandings or agreements, shall always have the sole and exclusive discretion and right to cause the partnership to repay in whole or in part the aggregate amount of said additional sums of money so paid in, as herein provided, by any limited partner.

IX.

Each limited partner and substituted limited partner, (but no assignee of either thereof who is not a substituted partner,) shall be entitled to share in the net profits of the partnership and to receive credit, at least yearly, for the proportion of the net profits that his or her then contributed capital bears to the total contributed capital. Net losses of the partnership determined at least yearly are to be shared by each partner in the proportion that his or her then contributed capital bears to the total contributed capital; provided, however, that net profits or losses shall be determined only after paying, accruing, or otherwise making provision for:

(a) General and limited partners' monthly salaries as may be determined at the discretion of the general partner or general partners from time to time.

(b) Interest payable or accruable to limited or general partners by reason of sums of cash paid in as partnership capital to the partnership, other than contributed capital sums, as hereinbefore provided; and

(c) Interest payable or accruable to limited or general partners by reason of sums in cash which may be loaned to the partnership, exclusive of additional partnership capital as heretofore provided (exclusive of contributed capital).

X.

The right is not given to any limited partner, but is denied to substitute an assignee as contributor in his or her place; provided, however, such substitution shall occur from time to time upon assignment by one limited partner to another limited partner (either original or substitute) or to any person as might inherit from any limited partner all or part of his or her contributed capital interest in the partnership by devise, bequest, or descent and provided, also, that upon the death or mental incompetency of a limited partner or previously substituted limited partner, the heirs, personal representatives, legatees or devisees entitled upon termination to receive the contributed capital interest in the partnership of the one so dying or so becoming mentally incompetent, shall be substituted as a contributor in the place of the one so dying or so becoming mentally incompetent, and be entitled to a pro rata share in the profits and shall bear a pro rata share of the losses as a substituted limited partner.

XI.

R. S. Shannon, Jr., as the general partner, shall control and manage the business of the partnership; and he shall not be

required to devote substantially all of his working time to the business and affairs of the partnership but only such of his working time as in his individual discretion he feels should be devoted to the business and affairs of the partnership.

XII.

The retirement, death, or mental incompetency of limited partners shall not dissolve the partnership; and in the event there is more than one general partner the death, retirement, or mental incompetency of one general partner shall not dissolve the partnership, but the surviving general partner or general partners shall have the right to continue, control, and manage the partnership business until termination of the partnership. The estate of such deceased or mentally incompetent general partner or such retiring general partner shall have no right, title, or interest in the partnership, its assets or business, other than as a limited partner by reason of the ownership of a contributed capital interest.

XIII.

The limited partners may not take part in the control of the business of the partnership and shall not be liable for the partnership debts, nor be bound by the partnership obligations, but their contributed capital shall be liable and bound and the general partner or general partners shall have all of the rights and powers and be subject to all of the risks and liabilities of a partner in a partnership without limited partners, except as in this agreement provided. As such, the general partner or general partners shall have the right, power, and authority to sell, lease, transfer, convey, and encumber all of the assets real, personal, and mixed of the partnership, and to enter into contracts for or on behalf of the partnership, and no third person dealing with him or them need look to the application of the proceeds from any such transaction, nor inquire as to written directions or authority

with respect thereto, which may or may not have been given him or them.

XIV.

Upon the termination of the partnership such of the net realizable assets as consist of cash, and as may be readily converted into cash shall be so converted and the proceeds therefrom shall be distributed to the general and limited partners in the proportions hereinbefore specified; provided, however, as to the real property, oil and gas leases, mining leases, oil or gas royalties, overriding royalties, operating agreements, and other agreements covering oil and gas leases or mining leases, or interests therein, owned by the partnership, the general and limited partners upon termination of the partnership shall be and become vested with undivided interests therein, as tenants in common, in the proportions of the invested capital interests as above provided.

XV.

The limited partners shall have no right to demand and receive property other than cash upon any distribution except as otherwise herein provided for in paragraphs XIV and XVII.

XVI.

The first fiscal year of the partnership shall be determined by the general partner or general partners. However, said first fiscal year of the partnership shall not extend beyond April 30, 1954. The general partner or general partners may at his or their discretion at any time and from time to time change the ending of the partnership's subsequent fiscal year or fiscal period.

XVII.

If at any time while this agreement is in full force and effect a limited partner or his or her heirs or personal representatives elects to terminate his or her interest in said partnership,

by reason of the death or mental incompetency of such partner or a desire by such partner to terminate his or her interest in the partnership, such limited partner or his or her heirs or personal representatives shall give written notice of such intention to terminate the interest of such partner in the partnership to the general and other limited partners, and the general and other limited partners, or any or all of them, shall have an option for five (5) months from the date of receipt of such notice to purchase such interest in said partnership, at a price to be determined as follows: Upon receipt of such notice of intention to terminate the interest in said partnership, all of the oil and gas and other mineral, metal, and fissionable material interests, leasehold estates, royalties, and overriding royalties listed in the balance sheet of the partnership, certified by the partnership's certified public accountant or accountants, as of the last day of the month in which said notice is given, shall be appraised at their fair market value by a competenent petroleum engineer or engineers or geologist or geologists selected by mutual agreement of all of the parties, general and limited. In the event all of the partners cannot agree upon the petroleum engineer or engineers or geologist or geologists to make such appraisal within one month from the date of receipt of such notice, then DeGolyer and MacNaughton, Petroleum Engineers of Dallas, Texas, shall be employed to make such appraisal. The fair market value as so determined by such engineer or engineers, geologist or geologists, shall be the value of all of said oil and gas and other mineral, metal, and fissionable material interests, leasehold estates, royalties, and overriding royalties listed in said balance sheet. The value of all of the other assets listed on the aforementioned balance sheet shall be determined on the basis of the value as set forth in the said balance sheet. The value of the interest of such partner shall be determined to be his or her proportionate share (based

upon the amount that his or her contributed capital in the partnership bears to the total contributed capital of the partnership) of the total assets of the partnership listed in said balance sheet and valued as above provided, less all of the partnership's liabilities listed in said balance sheet and all partnership capital other than contributed capital listed thereon, plus his or her proportionate share of partnership capital other than contributed capital, and the value as so determined shall be the purchase price.

In the event any or all of such other partners elect to exercise the option and purchase such interest, the purchase price shall be paid to such partner or to his or her heirs or personal representatives, and the interest in the contributed capital in the partnership of such partner so acquired by the other partner or partners shall be transferred to the contributed capital account of the partner or partners so electing to purchase such interest, in the proportion that each purchasing partner or partners interest in the contributed capital of the partnership bears to the total interest in the contributated capital of the partnership of such partner or partners so purchasing such interest.

In the event none of the other partners elect to purchase the interest of such partner at the price as so determined, within five (5) months from the date of receipt of such notice, such partner or his or her heirs or personal representatives shall, within six (6) months after the date said notice is received by said partners, receive for said partner's interest in the partnership:

(a) Written assignments effective as of 7:00 o'clock a.m. of the first day of the month following the expiration of the six month period provided for above, covering an undivided interest as a tenant in common in the same proportion as the interest he or she had in the contributed capital of the partnership in all of the

oil and gas and other mineral, metal, and fissionable material interests, leasehold estates, royalties, and overriding royalties or other interests owned or held by or for the account of the partnership at that time, said interests so conveyed to be subject to all direct obligations, if any, secured by such oil and gas and other mineral, metal, and fissionable material interests, leasehold estates, royalties, and overriding royalties or other interests in the same proportion. The said oil and gas and other mineral, metal, and fissionable material interests, leasehold estates, royalties, and overriding royalties or other interests in their entirety, and all direct obligations, if any, secured by such oil and gas and other mineral, metal, and fissionable material interests, leasehold estate, royalties, and overriding royalties or other interests shall not thereafter be considered in any computation of partnership net assets or liabilities.

(b) A sum of money equal to the net book value of the remaining assets as of the close of business of the last month of said six month period, provided for above, in which the aforementioned notice is received, after deducting all liabilities (exclusive of all obligations directly secured by the oil and gas and other mineral, metal, and fissionable material interests, leasehold estates, royalties, and overriding royalties and other interests, referred to in (a) above) including partners loans, if any, in the same proportion as the interest of the deceased, mental incompetent, or withdrawing partner in the contributed capital of the partnership at that time. The net book value of the remaining assets shall be determined in accordance with the policy of accounting of the partnership, particularly in respect to depreciation and depletion, except the value of the good will of the business and the trade name shall be fixed for this purpose at One Thousand Dollars ($1,000). The net book value of the remaining

assets shall be determined by the Certified Public Accountant regularly employed to examine the partnership accounts, and if no Certified Public Accountant is regularly employed, then by a Certified Public Accountant to be selected by a majority of the limited partners.

XVIII

If at any time during the continuance of the partnership the parties hereto shall deem it necessary or expedient to make any alterations, amendments, or additions hereto, it may be done by all partners signing and swearing to a certificate supplemental hereto.

XIV.

This certificate of partnership and partnership agreement is made and entered into pursuant to the so-called "Uniform Limited Partnership Law" (1935 Colorado Statutes Annotated, Ch. 123, Secs. 44-72), and, except as hereinabove expressly provided, the rights and liabilities of the partners, general and limited, shall be as in the said law specified.

Signed as of the 20th day of November, 1953.

R. S. Shannon Jr.

R. S. Shannon, Jr.

W. J. Quinlin

W. J. Quinlin

Kathryne E. Scoville

Kathryne E. Scoville

Phyllis L. Warnick

Phyllis L. Warnick

STATE OF COLORADO)
CITY AND COUNTY OF DENVER) ss

R. S. Shannon, Jr. and W. J. Quinlin each being first duly sworn, upon oath depose and say:

That they are two of the four partners above named, that they have read the foregoing Certificate of Limited Partnership of Shannon Oil Co. and know its contents, and that it is true of their own knowledge.

R. S. Shannon Jr.
R. S. Shannon, Jr.

W. J. Quinlin
W. J. Quinlin

Signed, sworn to, and acknowledged before me this 20th day of November, 1953.

My commission expires June 27, 1954

William C. Vandegrift
Notary Public

STATE OF CALIFORNIA)
COUNTY OF SAN FRANCISCO) ss

Kathryne E. Scoville and Phyllis L. Warnick each being first duly sworn, upon oath depose and say:

That they are two of the four partners above named, that they have read the foregoing Certificate of Limited Partnership of Shannon Oil Co. and know its contents, and that it is true of their own knowledge.

Kathryne E. Scoville
Kathryne E. Scoville

Phyllis L. Warnick
Phyllis L. Warnick

Signed, sworn to, and acknowledged before me this 23rd day of November, 1953.

My commission expires Jan 3, 1957

Irene Lerespi
Notary Public

STATE OF COLORADO)
CITY AND COUNTY OF DENVER) ss

On this 20th day of NOVEMBER, 1953, before me personally appeared R. S. Shannon, Jr. and W. J. Quinlin, to me known to be the persons described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed.

Given under my hand and notarial seal this 20th day of November, A. D. 1953.

William C. Vandegrift
Notary Public

My commission expires on the 27th day of June, A.D. 1954.

STATE OF CALIFORNIA)
COUNTY OF SAN FRANCISCO) ss

On this 23rd day of November, 1953, before me personally appeared Kathryne E. Scoville and Phyllis L. Warnick, to me known to be the persons described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed.

Given under my hand and notarial seal this 23rd day of November, A.D. 1953.

Irene Lerezzi
Notary Public

My commission expires on the 3 day of January A.D. 1955.

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

APR - 8 1955

224 New Customhouse
Denver 2, Colorado

April 4, 1955

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Application for DMEA assistance (Uranium), Shannon Oil Co., Crook County, Wyoming

Enclosed are the original and two copies of the subject application for Government assistance to explore the E½, NW¼ and W½, NE¼, Sec. 27, T-52-N, R-66-W, Crooks County, Wyoming for uranium at an estimated cost of $88,932.80.

One copy of this application has been retained in this office.

W. M. Traver

Enclosures

W. M. Traver

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

DMEA Date Rec'd. 4/8/55

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

APR 1 1955

BUREAU OF MINES

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
APR 8 1955

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

Not to be filled in by applicant

Docket No. 3762
Metal or Mineral Uranium
Date Received 4-8-55
Estimated Cost $88,932.80
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: SHANNON OIL CO., a limited partnership
603 Midland Savings Bldg.
Denver 2, Colorado
See attached list captioned 1.(d) for list of partners.

(*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. On accompanying paper

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: Being the E½NW¼ and the W½NE¼, Section 27, Township 52 North, Range 66 West of the 6th P.M., County of Crook, State of Wyoming. Have in possession abstract from date of patent to date of lease below verifying title to minerals and surface rights.

(*b*) State any mine name by which the property is known. Not applicable.

(*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. On accompanying paper.

(*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. Not applicable.

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. On accompanying paper.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. Not applicable.

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

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

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

16—66551-1

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

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

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

(*c*) The work will start within 90 days and be completed within 7 months from the date of an exploration project contract., unless weather intervenes, winter sometimes extreme.

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

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.). See accompanying papers.

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

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

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

(*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. See accompanying papers.

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

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

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

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

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

Explain in detail on acompanying paper. See accompanying papers.

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 31 MARCH, 1955

SHANNON OIL CO., a limited partnership
(Applicant)

By R. S. Shannon Jr.
General Partner

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

1.(d) List of partners in Shannon Oil Co. to be incorporated in Paragraph 1.(a) name of applicant:

1 - R. S. SHANNON, JR. (General Partner)
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLORADO

2 - W. J. QUINLIN
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLORADO

3 - KATHRYNE E. SCOVILLE
140 CASTENADA AVE.
SAN FRANCISCO, CALIFORNIA

4 - PHYLLIS L. WARNICK
3061 - 25th AVE.
SAN FRANCISCO, CALIFORNIA

4.(a) No mining operations have been initiated in the project area. The U. S. Atomic Energy Commission recently completed a exploration program in the area and 27 drill holes were completed on the property herein involved. This drilling program consisted of 3527 feet of plug bit drilling and 3834 feet of core drilling. AEC captioned their program as CARLILE PROJECT NO. 1 and NO. 1a (THORN RIDGE) and it was carried out under the jurisdiction of the Hot Springs Sub-Office, U. S. Atomic Energy Commission, Hot Springs, South Dakota.

A full report of the above exploration program, as applicable to the proposed project area, including maps of the area, drill hole locations and numbers, drill hole logs and assay reports are presented herewith and made a part of this application.

(c) Uranium mineralization and ore occurrences in the project area, as evidenced by the attached supporting exploration reports, were found in both upper and basal Lakota formation, a member of the lower Cretaceous sandstones. The Lakota formation, which has a thickness of from 74 to 119 feet within the project area has proven to be the most prolific uranium host rock in the Black Hills area. The project area lies 1.2 miles west of the Homestake Mining Company's Carlile mine which is a deposit of commercial importance in the Lakota formation.

Of the 27 holes drilled in the involved property 11 showed significant sections of uranium mineralization. Of the 11 mineralized holes 6 showed uranium deposits of ore grade. Four of the 6 ore holes (No's 900, 743, 746 and 708) are so grouped, and ore was encountered at such comparable depths in each hole as to indicate the probability of a significant ore body in the upper Lakota. The other two ore holes (704 and 735) are so located with relationship to each

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

4.(c) contd. other and ore was encountered at such comparable depths as to indicate the probability of a sizeable ore body in the basal Lakota. The above information makes further exploration and evaluation mandatory. If it is established that ore is consistent over the area presently delineated by the upper Lakota test holes above, an ore reserve of 200,000 to 300,000 tons is not improbable. By the same analysis if ore is consistent between the basal Lakota shows mentioned above, and further considering the thickness of the mineralized section involved and the massive nature of the basal Lakota, an ore body of 150,000 to 200,000 tons in this area is possible.

NOTE: None of the documents furnished in in support of this application need be returned.

(d) Project area lies approximately 17 miles northeast of Moorcroft, Wyoming, the nearest residence point and railhead (C.B. & Q. RR Co.). U.S. Highway No. 14 passes project area 1.6 miles to the west. Project area is served by an all weather secondary road which is contiguous to two sides of the involved property. Sundance, Wyoming, the county seat of Crook County, lies approximately 26 miles to the east. Newcastle, Wyoming, a supply center, is 66 miles to the southeast. Both are served by U. S. Highways.

(e) Adequate labor resources are available for any mining operation later contemplated. Materials, supplies and equipment are available in Newcastle, Wyoming, an oil and bentonite center, or from more distant points via truck or railroad freight. Water may be obtained from small streams close by or from the Belle Fourche River, less than two miles from the project area. The Morrison formation underlying the Lakota is productive of water. Electric power is available for medium power requirements.

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG
DENVER 2, COLO.

5.(b) The proposed work, a drilling program as patterned on the map presented herewith, is divided into two separate parts. The initial program is designed to explore the mineralized section of the upper Lakota formation immediately surrounding ore holes No's 900, 743, 746 and 708. The secondary program is designed to explore the basal Lakota in the vicinity of ore holes No's

5.(b) contd. 704 and 735. These areas may be considered as separate projects. If it is determined that ore is consistent between known ore holes in each horizon, each area will constitute a commercial deposit within itself. Exploration of both areas is necessary before actual mining operations are commenced to permit one shaft, properly located, to serve both levels and permit maximum efficiency of operation.

The initial and secondary exploration programs are further divided into four phases each. The development of each phase after the first will be dependent upon the completion and continued favorable indications of worth while discovery in the prior phase. Phase 1, of each program, provides for four 50 foot diagonal offset holes around the most favorable ore holes. This is designed to evaluate continuity and basic trend. Phase 2 steps out to a 125 foot grid pattern around each ore hole. Phase 3 is a further development of the 125 foot grid pattern and Phase 4 is a step-out to a 250 foot grid pattern. In consideration of known favorable shows the above exploration phases are most practicable.

In the initial program drill holes will be plugged to the Fuson/Lakota contact and then core drilled through the upper mineralized section. As an average this will mean drill to 175 foot level and core the interval between 175 feet and 205 feet. Average total depth 205 feet.

INITIAL PROGRAM

	NUMBER HOLES	PLUG BIT DRILLING	TOTAL	CORE DRILLING	TOTAL
Phase 1	12	175'	2100'	30'	360'
2	18	175'	3150'	30'	540'
3	21	175'	3675'	30'	630'
4	19	175'	3325'	30'	570'
Totals	70		12250'		2100'

In the secondary program drill holes will be plugged to approximately the 235' level and cored through the interval between 235 and 275 feet or at least to the Lakota/

SHAWNON OIL CO.
COSTITT LAND SAVINGS BLDG.
DENVER 2, COLO.

5.(b) contd. Morrison contact. Average total depth 275 feet.

SECONDARY PROGRAM

	NUMBER HOLES	PLUG BIT DRILLING	TOTAL	CORE DRILLING	TOTAL
Phase 1	8	235'	1880'	40'	320'
2	9	235'	2115'	40'	360'
3	11	235'	2585'	40'	440'
4	9	235'	2115'	40'	360'
Totals	37		8695'		1480'

It must be understood that drilling and coring intervals, mentioned in both programs above, are dealing in averages. Strict geological controls will be instituted by taking samples of drill cuttings, radiometric scanning of samples, probing drill holes, etc. to assure that no favorable horizon is passed without proper evaluation.

All holes will be probed with recording drill hole probe. All favorable cores will be sampled and subjected to radiometric and chemical assay to determine content and interval. Budget on assaying is predicated on one foot samples over an average ten foot section in each hole or an average of 10 core samples per hole.

(d) Applicant is an active producing oil company with many years experience in acquisition, development, and production of oil properties. This experience qualifies applicant to properly evaluate findings in above contemplated program. Further, applicant is financially and technically capable of developing above property if the exploration of said property indicates such action. Exploration program will be under direct supervision of applicants field superintendent. Drilling and core drilling will be awarded to an independent contractor with operating experience in the general area. Geologic work will be provided by retaining a qualified consultant charged solely with responsibility for successfully following developments in the exploration program.

SHANNON OIL CO.
COLORADO SAVINGS BLDG.
DENVER 2, COLO.

6. ESTIMATE OF COSTS. Note: Estimates below on drilling costs, coring, etc. based on proposals from five independent drilling contractors.

(a) INDEPENDENT CONTRACTS.

Non-core drilling		
20,945' @ $2.00/ft.	$41,890.00	
Core drilling		
3,580' @ $3.50/ft.	12,530.00	
Standby rig time		
107 hours @ $12.00/hr.	1,284.00	
Bulldozer operations		
214 hours @ $15.00/hr.	3,210.00	
Recording drill hole probe		
7,940' @ 10¢/ft.	794.00	
		$59,708.00

24,525 ft
3,148 ft
Footage

(b) LABOR, SUPERVISION & CONSULTANTS

1 Supervisor		
50 days @ $50.00/day	2,500.00	
Expense 50 days @ $12.00/day	600.00	
Car expense 5000 mi. @ 8¢/mi.	400.00	
1 Consulting		
75 days @ $50.00/day	3,750.00	
Expense 75 days @ $12.00/day	900.00	
Pickup truck 7500 mi. @ 10¢/mi.	750.00	
		$ 8,900.00

(c) OPERATING MATERIALS & SUPPLIES

Core boxes 350(36"x12") @ $3.50	1,225.00	
Sample bags 2150 @ 10¢	215.00	
		$ 1,440.00

(d) OPERATING EQUIPMENT

Scintillator, transit, Brunton transit, furnished by applicant at no cost to project.

(e) REHABILITATION AND REPAIRS

None

(f) NEW BUILDINGS, IMPROVEMENTS AND INSTALLATIONS

None

(g) MISCELLANEOUS

Rental of storage space for core samples	100.00	
Assaying-Chemical and Radiometric 1070 samples @ $10.00/sample	10,700.00	
		$10,800.00
Sub-total		$80,848.00

(h) CONTINGENCIES

10% above items estimate of necessary contingencies	8,084.80
Grand Total	$88,932.80

SHANNON OIL CO.
CONTINENTAL SAVINGS BLDG.
DENVER 2, COLO.

7.(b) Applicant, upon approval of application and execution of contract, will prosecute exploration program outlined above. Applicant will pay all costs as they become due and payable and in turn will invoice Government for its proportionate share of costs (75%) in manner prescribed in applicable regulations.

SHANNON OIL CO.
CO. [illegible] SAVINGS BLDG.
[illegible] COLO.

MINING LEASE

THIS AGREEMENT of lease, made and entered into this 10th day of September, 1954, by and between Frank E. Laymon and Anna M. Laymon, his wife, of 534 East 8th Street, Sheridan, Wyoming

hereinafter called lessor (whether one or more), and Shannon Oil Co., a limited partnership, hereinafter called lessee, of 603 Midland Savings Building, Denver 2, Colorado

W I T N E S S E T H :

1. For and in consideration of the sum of Ten ($10.00) Dollars and other good, valuable and legal consideration, the receipt and sufficiency of which is hereby acknowledged by lessor, and of the covenants, agreements, and payments hereinafter provided to be made and performed, lessor hereby grants, leases, lets, and demises, exclusively unto lessee the following-described property located in Unorganized Mining District, Crook County, State of Wyoming, and more particularly described as follows:

Being the E½ of the NW¼ and W½ of the NE¼, Section 27, T 52 N, R 66 W of the 6th P.M., Wyoming, containing 160 acres, more or less.

together with all the dips, spurs, rolls, and angles and also all the uranium and any and all other minerals of any nature whatsoever, including but not limited to all metals, ores, ore bearing quartz, rock, and earth therein, excluding oil and gas, for the purpose of investigating, exploring, drilling, and mining for, producing, saving, taking, owning, transporting, storing, handling, and treating uranium and all other minerals, whether similar, or dissimilar.

2. TO HAVE AND TO HOLD the same for the purposes of exploration and mining for a primary term of ten (10) lease years commencing on the date hereof, receipt of advance rental for the first five (5) years is hereby acknowledged. FEL AML

After the expiration of the primary term lessee shall have the right to continue this lease in full force and effect on all the above-described property, or on such property as has not been previously surrendered or abandoned for as long as commercial quantities of uranium or any other mineral shall be produced from said property, it being understood and agreed, however, that notwithstanding anything to the contrary herein contained, if the United States of America, or its duly authorized buyers or representatives, shall suspend buying of uranium ore for a period of time, and there is no other market therefor, the term of this lease shall continue during such period of suspended buying and shall not be subject to cancellation by lessor for failure of lessee to produce and market such ore. ~~In the event no uranium or other mineral is being produced in commercial quantities from said property at the end of said primary term, lessee shall have the right to continue the term of this lease after the expiration of the primary term by expending a minimum amount of ---------- per year upon the development or exploration of such property as it may wish to retain, PROVIDED, HOWEVER, that in the event lessee shall surrender any portion or portions of the said property as hereinafter provided, then such minimum amount shall be reduced in the proportion that the acreage covered herein is reduced by such surrender or surrenders, but in no event shall said minimum amount be less than ---------- per year.~~ FEL AML

3. Lessor hereby grants to lessee during the term of this lease, possession of such property; the right to explore, map, mine, drill, and extract ore therefrom; to dump waste materials thereon and upon any adjoining areas under the control of lessor; to construct ore bins and buildings thereon; to perform any and all work connected therewith, including construction of roads; to lay pipe lines; to construct mills, power stations, power and communication lines, houses for its employees, and other structures and facilities; and further grants to lessee all road-of-way to which lessor may be entitled for egress and ingress to any and all demised properties.

PORTING PARAGRAPH 3. (d), INSTRUCTIONS

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG
DENVER 2, COLO

4. Lessee, at its option, may pay and discharge any taxes, mortgage, or other liens existing, levied, or assessed on or against the above-described land, and in the event it exercises such option it shall be subrogated to the rights of any holder or holders thereof and may reimburse itself by applying to the discharge of any such mortgage, tax, or other lien, any royalty or rentals accruing hereunder. In the event that the lessor owns a less interest in the above-described land than the entire and undivided fee simple estate therein, then the royalties and rentals herein provided for shall be paid the lessor only in the proportion which lessor's interest bears to the whole and undivided fee, and lessor shall be entitled to retain only such proportion of any moneys previously advanced or paid by the said lessee as lessor's interest bears to the whole and undivided fee.

5. Lessee agrees to conduct its mining operations thereon in accordance with good mining practice and in compliance with health and safety regulations; to permit lessor at lessor's own risk to inspect such premises at all reasonable times to make surveys of the same and to take samples of ore mined or in place, using any access roads of lessee, and to make available to lessor survey maps, drilling logs, and other data which may be compiled pertaining to ore deposits found therein.

6. Lessee shall pay lessor twelve and one half per cent (12½%) of the Atomic Energy Commission bonus received by lessee for initial production of uranium ores from eligible new domestic mines. Said payment shall be made as soon as practicable after receipt of said bonus from the Atomic Energy Commission and shall be subject to provisions of the regulations of the Atomic Energy Commission regarding payment of bonuses. Lessee shall comply with all regulations of the Atomic Energy Commission for certification of the property as mining property eligible for bonus payments. For purposes of computing the amount of royalty payments to be made under this section, a record shall be kept by lessee of the ore mined on each property or group of properties regarded by the Atomic Energy Commission as a single eligible unit for purposes of bonus payments.

7. In addition to the bonus payments in paragraph 6 above, lessee shall pay lessor a royalty of twelve and one half per cent (12½%) of the price received for ore mined and sold from the land covered by this lease. In determining the above royalty, neither development allowances nor haulage allowances shall be included in the price of said ore, and all haulage expenses paid by lessee in excess of said haulage allowances shall be deducted from the price of said ore.

8. In the event lessee shall leach or otherwise process ore from the above-described land, lessee shall pay lessor a royalty equal to twelve and one half per cent (12½%) of the price paid per pound for uranium and associated minerals in ore of like grade delivered to a mill or purchasing depot, less all development and haulage allowances, which royalty shall be paid on the total number of pounds of uranium and any and all other minerals extracted and sold therefrom. For ore of a lower grade than that acceptable at a mill or purchasing depot, the price per pound of uranium and associated minerals recovered from such ore shall be that proportion of the minimum market price that the grade of the ore is to the minimum acceptable grade. The royalty for all other minerals extracted and sold shall be twelve and one half per cent (12½%) of the value of the ore mined.

The grade of the ore processed by lessee shall be determined by samples properly taken from said ore and assayed by lessee. Samples and assays by lessee shall be final, except that lessee shall, upon request, furnish lessor for independent assay at lessor's expense, split samples of all ore which it processes. If such samples are requested by lessor, lessee shall retain split samples for later analysis by an independent referee. In the event of a dispute concerning lessee's assay of samples, royalty payments shall be based on the assay results of the independent referee, who shall be acceptable to both lessor and lessee, and all costs of the referee shall be paid by the party whose assay shows the greatest variance from that of the referee. Royalty payments for each month shall be made on or before the twenty-fifty (25th) day of the following month.

9. If diligent investigation to determine the possibilities of ~~a~~ commercial enterprise is not commenced on the above-described land on or before ~~one~~ (1) year from this date or in the event such investigation is made and the possibilities for a commercial enterprise are found to be favorable and a program for the development of said land is not commenced immediately thereafter, then in either such event this lease shall terminate as to both parties, unless lessee shall, on or before ~~one (1)~~ five (5) year from this date, pay or tender to the lessor or for the

FEL
a m 2

FEL
a m 2

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

lessor's credit in **First National Bank** at **Sheridan Wyoming**, or its successor or successors, which Bank and its successors are lessor's agents and which shall continue as the depository regardless of changes in the ownership of the land, the sum of **Three Thousand ($3,000.00) Dollars**, which shall operate as a rental and cover the privilege of deferring the commencement of a diligent investigation to determine the possibilities of a commercial enterprise one (1) year from said date, or in the event such investigation is made and the possibilities of a commercial enterprise are found to be favorable, said sum shall also operate as a rental and cover the privilege of deferring the commencement of a program for development of said land one (1) year from said date. In like manner and upon like payments or tenders, the commencement of said diligent investigation or said program for development may be further deferred for like periods successively during the primary term of this lease. And it is understood and agreed that the consideration first recited herein, the down payment, covers not only the privileges granted to the date when said rental is payable as aforesaid, but also the lessee's option of extending the period as aforesaid, and any and all other rights conferred. All payments or tenders may be made by check or draft of lessee or any assignee thereof, mailed or delivered on or before the rental paying date. Lessee may at any time execute and deliver to lessor or place of record a release or releases covering any portion or portions of the above-described land and thereby surrender this lease as to such portion or portions and be relieved of all obligations as to the acreage surrendered and thereafter the rentals payable hereunder shall be reduced in the proportion that the acreage covered herein is reduced by said release or releases; provided, however, that the land surrendered shall be in tracts of not less than 80 acres and lessee shall retain a total of at least 80 acres in order to maintain its rights under this lease. Notwithstanding the death of the lessor, or his successor in interest, the payment or tender of rentals in the manner provided above shall be binding on the heirs, devisees, executors, and administrators.

~~In order to minimize permanent damage to the surface from any open or strip mining operations which may be conducted, lessee agrees either to return all waste rock to the original pit and level the land so that it will approximate its previous configuration or to pay lessor for the surface area damaged by those mining operations a sum of Fifteen Dollars ($15.00) per acre for grazing land and Fifty Dollars ($50.00) per acre for farm land; provided, however, that lessee shall be under no obligation either to return the waste rock and level the land or to pay lessor for the surface area damaged if the royalty and rental payments from the area damaged by lessee's operations hereunder exceed Two Hundred and Fifty Dollars ($250.00) per acre. In the event lessee conducts underground mining operations, all timbering will be left in place when the mine is abandoned.~~ FEE AML

10. If the leased premises shall hereafter be owned in severalty, or in separate tracts, the premises, nevertheless, shall be explored and developed as one lease and all royalties and bonuses accruing hereunder shall be treated as an entirety and shall be divided among and paid to such separate owners in the proportion that the acreage owned by each such separate owner bears to the entire leased acreage. It is hereby agreed that, in the event this lease shall be assigned as to a part or as to parts of the above-described land, and the holder or owner of any such part or parts shall fail or make default in the payment of the proportionate part of the rent due from him or them, on an acreage basis, such default shall not operate to defeat or affect this lease insofar as it covers a part or parts of said land upon which the said lessee or any assignee hereof shall make due payments of said rentals.

11. If at any time there be as many as six parties (or more) entitled to receive royalties under this lease, lessee may withhold payment thereof unless and until all parties designate in writing in a recordable instrument to be filed with the lessee, a Trustee to receive all royalty payments due hereunder and to execute division and transfer orders on behalf of said parties and their respective successors in title.

12. Lessee at its expense will insure each and every workman employed in its operations as provided in all applicable statutes with respect to workman's compensation and/or employer's liability insurance; and lessee will procure and maintain at its expense public liability insurance in a reputable and financially responsible company properly safeguarding against liability for injury to persons, including injuries resulting in death, and loss or damage to property arising out of lessee's operations hereunder.

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

13. Lessor hereby agrees to cooperate with lessee in the securing of loans from the Federal Government which may be deemed advisable by lessee for the exploration, development, and mining of ore from the claims leased hereunder whether such loans may be made available under the terms of the Defense Minerals Act as now in effect or hereafter amended or any other Federal law, rule, or regulation now in effect or hereafter promulgated. Lessor further agrees to sign any documents necessary for the procurement of any such loans; PROVIDED, HOWEVER, that lessor shall not be required to sign any instruments or enter into any agreements which will subject lessor to any personal liability or reduce the royalty payments due hereunder.

14. In the event of any breach or default by lessee, the lessor may give written notice by registered mail thereof to lessee. Upon receipt of such notice, lessee shall have ninety (90) days to cure such breach or default, if such breach or default actually exists, and maintain the lease in effect. If lessee shall not have cured or taken diligent steps to cure any such breach or omission within said ninety (90) day period, lessor may terminate this lease. Failure to enforce such forfeiture shall not constitute a waiver by lessor of any rights in the event of a future breach of such term or provision hereof.

All express and implied covenants of this lease shall be subject to all federal and state laws, executive orders, rules, and regulations, and this lease shall not be terminated, in whole or in part, nor lessee held liable in damage for failure to comply therewith if compliance is prevented by or if such failure is the result of any such law, order, rule, or regulation, or if such compliance is prevented by strikes, riots, flood, fire, storm, acts of God, war, or other causes not within lessee's control.

15. Lessee shall have the right at any time during the term of this lease, and for a period of six (6) months after the termination thereof for any reason whatsoever, to remove as lessee's own property all buildings, improvements, fixtures, bins, machinery, equipment, and other personal property excepting only ties and timbering which may have been erected or placed by lessee on said premises.

16. If the estate of either party hereto is assigned (and the privilege of assigning in whole or in part is expressly allowed), the covenants hereof shall extend to their heirs, executors, administrators, successors, and assigns, but no change of ownership in the land or in the rentals or royalties shall be binding on the lessee until after notice to the lessee and it has been furnished with the written transfer or assignment or a certified copy thereof, and in case lessee assigns this lease, in whole or in part, lessee shall be relieved of all obligations with respect to the assigned portion or portions arising subsequent to the date of assignment. Lessee is expressly granted the right to assign this lease or any interest therein.

17. With respect to and for the purpose of this lease, lessor, and each of them if there be more than one, hereby release and waive the right of homestead, and this lease, its terms, conditions, and stipulations shall extend to and be binding on all successors of said lessor or lessee.

WHEREOF witness our hands as of the day and year above written.

Harry F. Schwartz

Frank E. Laymon
Frank E. Laymon

Anna M. Laymon
Anna M. Laymon

(SOUTH DAKOTA)

STATE OF)
) ss
COUNTY OF)

On this ____ day of _____, 19__, before me, _____, the undersigned officer, personally appeared _____, known to me to be the person_ whose name_ ___ subscribed to the within instrument and acknowledged that _he_ executed the same for the purpose therein contained.

_____
Notary Public

My commission expires _____.

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

(WYOMING)

STATE OF WYOMING)
) ss
COUNTY OF SHERIDAN)

On this 6TH day of OCTOBER, A.D. 1954, before me personally appeared Frank E. Laymon and Anna M. Laymon, to me known to be the persons described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed, including the release and waiver the right of homestead, the said wife having been by me fully apprised of her right and the effect of signing and acknowledging said instrument.

Given under my hand and notarial seal this 6TH day of OCTOBER, A.D. 1954.

Harry F. Schwartz
Notary Public

My commission expires on the 6TH day of JULY, A.D. 1958

(UTAH)

STATE OF)
) ss
COUNTY OF)

On the ____ day of _____, A.D. 19__, personally appeared before me _____, the signer_ of the above instrument, who duly acknowledged to me that _he_ executed the same.

_____
Notary Public

My commission expires _____

(COLORADO)

STATE OF)
) ss
COUNTY OF)

The foregoing instrument was acknowledged before me this _____ day of _____, 19__, by _____.

Witness my hand and official seal.

My commission expires _____

_____
Notary Public

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

135

AGREEMENT AND LEASE

THIS AGREEMENT AND LEASE, made and entered into this 27th day of October, 1954, by and between EDWIN F. THORN, a single man of Crook County, Wyoming, hereinafter called First Party, and SHANNON OIL CO., a limited partnership with office address at 603 Midland Savings Building, Denver 2, Colorado, hereinafter called Second Party.

WITNESSETH:

WHEREAS, First Party is the owner of the surface rights to the following-described land situate in Crook County, Wyoming, to-wit:

E½NW¼, W½NE¼ of Section 27, Township 52 North, Range 66 West of the 6th P.M.,

and

WHEREAS, FRANK E. LAYMON and ANNA M. LAYMON are the owners of all of the minerals lying in and under the lands above described, and

WHEREAS, Second Party is the lessee under a mining lease of date September 10, 1954, by and between FRANK E. LAYMON and ANNA M. LAYMON, covering the land above described, and

WHEREAS, the Second Party desires to explore for, drill for, map, mine, and extract uranium and other minerals and fissionable materials in, on, upon, from and under the land above described, to construct, if necessary, ore bins and buildings thereon and to perform any and all work connected therewith, including the construction of roads, and to construct mills, power stations, power and communication lines, houses for its employees, and other structures and facilities in, on, upon, over and across the above-described land, and desires to have the right of ingress, egress and regress in, to and from said above-described land and any part thereof, and

WHEREAS, First Party desires to ratify, approve and confirm the aforementioned mining lease to the same and full extent

SUPPORTING PARAGRAPH 3. (d), INSTRUCTIONS

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

as if he had been a party signatory thereto, and desires to lease the surface of said lands to Second Party for a term of five (5) years, and as long thereafter as commercial quantities of uranium or any other mineral or fissionable material is produced from the land above described, for all of the uses and purposes hereinabove set forth.

NOW, THEREFORE, in consideration of the sum of Three Hundred Dollars ($300.00), in hand paid by Second Party to First Party, the receipt and sufficiency of which is hereby confessed and acknowledged by First Party, First Party does hereby demise, lease, let and rent the surface of said land to the Second Party for a period of five (5) years from the date hereof and as long thereafter as commercial quantities of uranium and any other mineral or fissionable material shall be produced from the land above described; and as a further consideration for the execution of this agreement and lease, Second Party agrees to pay to First Party a royalty of one and one-half percent (1½%) of the price received for all ore or fissionable material mined and sold from the land above described during the term hereof, provided, however, that in determining the price received for all ore or fissionable materials mined and sold, neither development allowances nor haulage allowances shall be included in the price received.

It is understood and agreed that Second Party, for the entire term of the lease as hereinabove provided for, shall have the exclusive use of said land or any part thereof to explore for, drill for, map, mine, and extract uranium and other minerals and fissionable materials, to construct ore bins and buildings thereon, and to perform any and all other work and operations connected therewith, including the construction of roads, mills, power stations and communication lines, and houses for its employees and other structures and facilities, and that Second Party shall also have the exclusive use of said lands for any other of its operations connected with those above named. It is also understood

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

and agreed that , during the entire term of this agreement and lease, Second Party shall have the same right of ingress, egress and regress in, to, and from said lands above described or any part thereof, as First Party now has, and shall have the right to use all roads or rights-of-way to which First Party may be entitled.

In order to minimize permanent damage to the surface from any mining or other operations of Second Party on the land above described, Second Party agrees that it will restore all of the land to its previous configuration and condition or pay the First Party for the surface area damaged by its operations on the land above described One Hundred Dollars ($100.00) per acre for crop land and Fifty Dollars ($50.00) per acre for pasture land damaged by its operations, and the actual value of all growing crops that are damaged by its operations, provided, however, that Second Party shall be under no obligation to restore the land or any part thereof to its previous configuration or condition, or to pay Second Party for the surface area damaged if the royalty payments from the damaged area exceed One Hundred Dollars ($100.00) per acre for crop land or Fifty Dollars ($50.00) per acre for pasture land or exceed the actual value of growing crops; and provided further that the payment of damages to First Party as above provided shall constitute payment in full to First Party for any and all damages of any nature or kind whatsoever to First Party that may be occasioned by any of Second Party's operations in, on, or under the land above described, and shall release Second Party of and from any and all claims by First Party of any nature or kind whatsoever.

It is further understood and agreed that the Atomic Energy Commission or any other Federal or governmental body, or any of its agents or employees, shall have the right to enter upon the land above described and use the same for the same uses and purposes as are hereinabove granted to Second Party.

SHANNON OIL CO.
663 MIDLAND SAVINGS BLDG
DENVER 2, COLO.

It is also understood and agreed by the parties hereto that Second Party shall have the right at any time to surrender all of its interest in this agreement and lease to First Party by assigning to First Party, without covenants of warranty, all of its right, title and interest in this agreement and lease and thereupon be relieved and released of and from all further liabilities and obligations hereunder.

It is further understood and agreed by the parties hereto that the above-named consideration of Three Hundred Dollars ($300.00), the aforementioned royalty of one and one-half percent (1½%), and the rental of Sixty Dollars ($60.00) hereinafter provided for shall constitute payment in full to First Party of all rental due First Party for the use of the surface of the above-described land for the entire term of this lease and any extension thereof.

It is further understood and agreed that, in the event commercial quantities of uranium or any other mineral or fissionable material are not being produced at the end of five (5) years from the date hereof, Second Party shall have the right and option to extend this lease from year to year for a period of five (5) years thereafter by paying or tendering to the First Party's credit on or before the 27th day of October, 1959, and on or before the 27th day of October of each year thereafter in the Stockmens Bank ~~Bank~~ at Gillette, Wyoming, or its successor or successors, the sum of Sixty Dollars ($60.00) which shall operate as a rental for the succeeding year, provided, however, that, in the event commercial quantities of uranium or any other mineral or fissionable material is or are discovered on the land above described at any time during said five- (5) year period, then this lease and agreement shall continue in full force and effect for as long thereafter as uranium or any other mineral or fissionable material is produced in commercial quantities from the land above described without the payment of any further or additional rental.

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

First Party agrees that Second Party shall have the preferential right to purchase the surface rights to the land above described and if at any time during the term of this agreement and lease he desires to sell the surface rights to the land above described and receives a bona fide offer therefor, he will notify Second Party in writing, by United States Registered Mail, postage prepaid, addressed to Second Party at the address above stated, stating that he desires to sell the surface rights to the land above described, and shall advise Second Party of the price and terms offered, and Second Party shall have an option for thirty (30) days from the receipt of such notice to purchase the surface rights to said land for the same price and upon the same terms.

As a part of the consideration for this agreement and lease, First Party does hereby fully and wholly release and discharge Second Party, its agents and employees, and the Atomic Energy Commission, its agents and employees, of and from any and all claims of any nature or kind whatsoever, arising or claimed to arise, by any operations of the Second Party, its agents or employees, or by the operations of the Atomic Energy Commission, its agents or employees, on the land above described prior to the date hereof, or for any other claims of any nature or kind whatsoever arising, or claimed to arise, prior to the date hereof.

Upon the expiration of the term of this lease as hereinabove provided for or upon the surrender by Second Party of its interest in this agreement and lease as hereinabove provided for, Second Party shall have a reasonable time thereafter to remove all property of whatsoever kind or nature which it has placed upon or shall place upon said above-described land.

First Party does, by the execution of this agreement and as part of the consideration therefor, hereby ratify, approve, and confirm the aforementioned mining lease of date September 10, 1954, by and between FRANK E. LAYMON and ANNA M. LAYMON as Lessors, to SHANNON OIL CO., a limited partnership, as Lessee, to the same and full extent as if he had been a party signatory thereto.

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

This agreement shall inure to the benefit of and be binding upon the parties hereto, their respective heirs, personal representatives, successors and assigns.

IN WITNESS WHEREOF, the parties have executed this agreement the day and year first above written.

Edwin F. Thorn

Edwin F. Thorn

SHANNON OIL CO.

By R. S. Shannon Jr.
General Partner

STATE OF WYOMING)
) ss
COUNTY OF CROOK)

On this 27th day of October, 1954, before me personally appeared EDWIN F. THORN, to me known to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same as his free act and deed.

Given under my hand and notarial seal this 27th day of October, 1954.

Nora Kenner
Notary Public

My commission expires September 23, 1957.

STATE OF COLORADO)
) ss
CITY AND COUNTY OF DENVER)

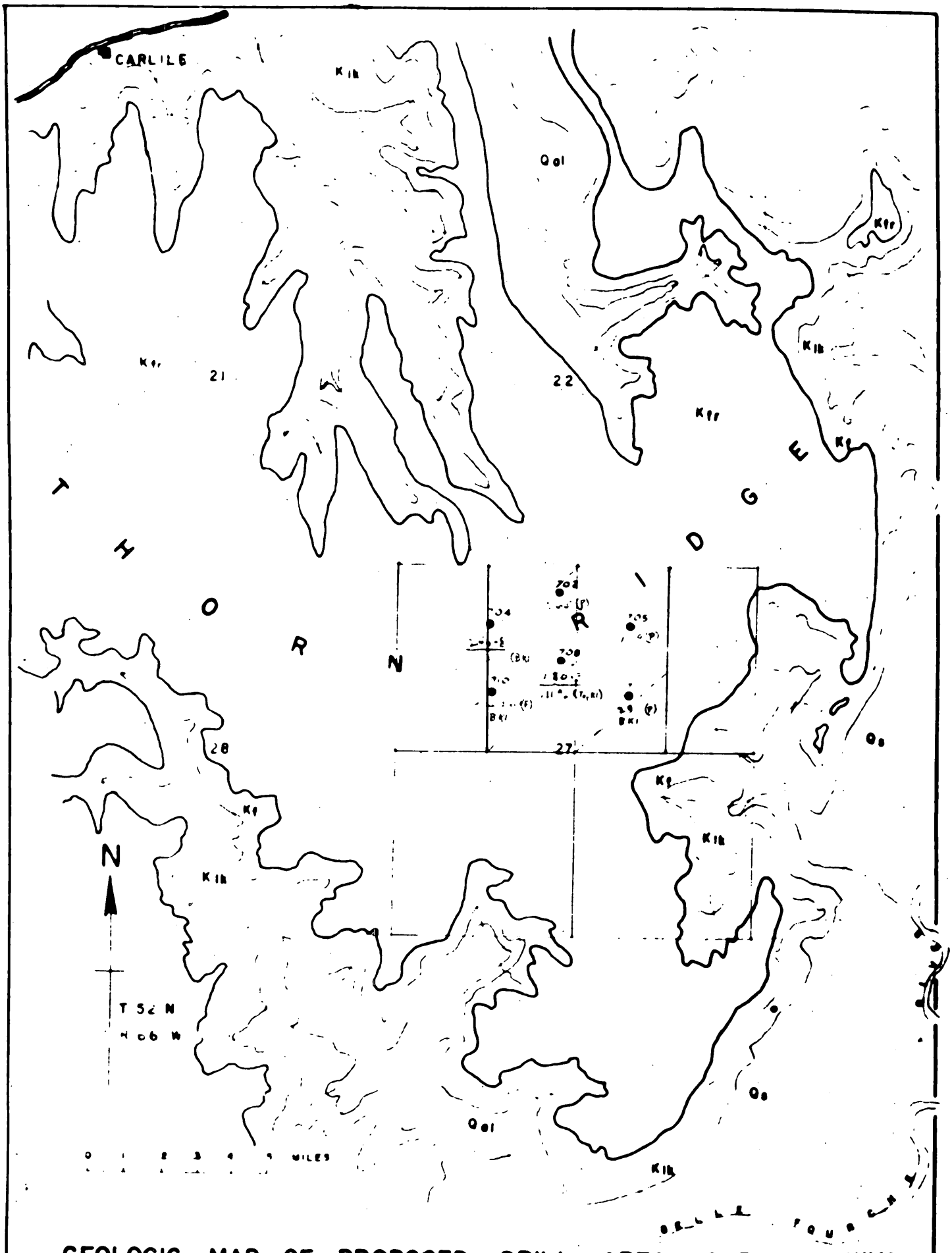
On this 29th day of OCTOBER, 1954, before me personally appeared R. S. SHANNON, JR., General Partner of SHANNON OIL CO., a limited partnership, to me known to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same as his free act and deed and as the free act and deed of said Partnership.

Given under my hand and notarial seal this 29th day of OCTOBER, 1954.

Oscar E. Johnson
Notary Public

My commission expires My Commission expires January 27, 1958

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.



GEOLOGIC MAP OF PROPOSED DRILL AREA, CARLILE, WYO.

HOLE LOCATIONS ~ FRANK E. LAYMAN PROPERTY

SUBMITTED IN SUPPORT
PARAGRAPH 4. (c) INSTRUCTIONS

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG
DENVER 2, COLO.

Shannon Oil Company Lease, Layman Thorn Property.

HOLE	DEPTH	COLLAR ELEVATION	CONTACT Kfr-Kf	CONTACT Kf-Klk	CONTACT Klk-Jm
702	270	4374.3	4317.3	No core	4116.3
704	274	4355.7	4297.7	4181.7	4097.7
705	271	4401.7	4343.7	4227.7	4142.7
708	285	4381.7	4323.7	4206.7	4122.7
710	275	4357.8	4301.3	4182.8	4094.8
711	280	4390.5	4335.5	4225	4125.5
723	260	4350.9	4295 .9	4181.9	4099,9
732	273	4361.7	4301.7	4198.7	4090
733	272	4374.1	4316.1	4210.1	4109
735	281	4369.7	4309.7	4205.7	4093.7
743	255	4380.5	4323.5	4207.5	4133.5
744	253	4399	4338	4236	4151
745	278	4385.1	4323.1	4211.1	4121.1
746	287	4393.6	4333.6	4233.6	4115.6
747	263	4390	4326	4229	4140
748	265	4403	4342	4231	4141
749	278	4369.6	No core	4203.6	4100.6
750	283	4380	4323	4222	4106
751	282	4379.9	4317.9	4220.9	4106.9
752	258	4351.8	4296.3	4182.8	4098.8
753	284	4345.2	4285.2	4177.2	4082.2
754	275	4348.0	4292	4182	4080
755	278	4364.4	4306.4	4193.4	4095.4
756	265	4372.9	4315.9	4221.4	4114.9

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

HOLE	DEPTH	COLLAR ELEVATION	CONTACT Kfr-Kf	CONTACT Kf-Klk	CONTACT Klk-Jm
900	268	4377.4	4317.4	4214.4	4119.4
903	288	4386.8	4325.8	4212.8	4106.8
905	270	4354.1	4299.1	4194.1	4105.1

SUPPORTING PARAGRAPH 4.(c) INSTRUCTIONS

Assay Data - Shannon Oil Co. lease

Hole No.	Sample No.	Interval	Radiometric	Chemical
704	F14610	246 - 248 feet	0.27%	0.30%
708	F14611	180 - 183 "	0.11%	0.11%
		(Poor core - interval doubtful)		
743	F14771	181 - 182 feet	0.006%	No assay
743	F14772	182 - 183 "	0.03%	0.02%
743	F14773	183 - 184 "	0.03%	0.03%
743	F14774	184 - 185 "	0.03%	0.04%
743	F14775	185 - 186 "	0.05%	0.05%
743	F14776	186 - 187 "	0.06%	0.05%
743	F14777	187 - 188 "	0.06%	0.06%
743	F14778	188 - 189 "	0.08%	0.09%
743	F14779	189 - 190 "	0.11%	0.14%
743	F14780	190 - 191 "	0.15%	0.15%
743	F14781	192 - 193 "	0.10%	0.08%
743	F14782	193 - 194 "	0.27%	0.37%
743	F14783	194 - 195 "	0.23%	0.25%
743	F14784	195 - 196.5 "	0.09%	0.11%
735	F14785	271 - 272 "	0.03%	0.05%
		(Very poor core recovery)		
751	F14786	260.5 - 261.5 feet	0.07%	
751	F14787	260 - 260.5 feet	0.02%	
751	F14788	261.5 - 262 "	0.02%	
746	F14789	215 - 216 "	0.009%	
746	F14790	216 - 217 "	0.02%	
746	F14791	217 - 217.8 "	0.004%	
746	F14792	178 - 179 "	0.003%	
746	F14793	179 - 180 "	0.02%	
746	F14794	180 - 181 "	0.06%	
746	F14795	181 - 182 "	0.23%	
746	F14796	182 - 183 "	0.01%	
746	F14797	186 - 187 "	0.39%	
746	F14798	187 - 187.7 "	0.05%	
746	F14799	187.7 - 188.4 feet	0.04%	
756	F14800	190 - 191 feet	0.07%	
903	F14644	196 - 197 "	0.01%	
903	F14645	197 - 198 "	0.03%	
903	F14646	198 - 199 "	0.04%	
903	F14647	199 - 200 "	0.08%	
903	F14648	200 - 201 "	0.06%	
903	F14649	201 - 202 "	0.02%	
903	F14650	202 - 203 "	0.01%	
903	F37551	210 - 211 "	0.06%	
903	F37552	211 - 212 "	0.03%	
903	F37553	207.5 - 208.5 feet	0.01%	
900	F37554	189 - 190 feet	0.11%	
900	F37555	188.5 - 189 "	0.01%	
900	F37557	190 - 190.5 "	0.01%	

SUPPORTING PARAGRAPH 4.(c) INSTRUCTIONS

SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.

DOCKET COPY

Murphy
Ellis

Project Summary Report

By: F. M. Murphy February 20, 1957

1. Docket No. DMEA-3762 (Uranium)
Contract No. Idm-E870

Operator - Shannon Oil Company, a limited partnership
R. S. Shannon, Jr., General Partner
W. J. Quinlin, Limited "
Kathryne E. Scoville, " "
Phyllis L. Warnick, " "
Mailing address:
603 Midland Savings Building
Denver 2, Colorado

Operator's Property Rights-

A lease on 160 acres situated in the E½ of the NW¼ and the W½ of the NE¼ of sec. 27, T. 52 N., R. 66 W., 6th P.M., Crook County, Wyoming.

2. Contract dated September 14, 1955.

Amendments -

Amendment No. 1, dated February 9, 1956, allowed recess period beginning November 26, 1955, and ending May 1, 1956.

Termination Agreement -

Dated August 20, 1956, effective May 25, 1956, signed by the Executive Officer, Region III, and the Applicant.

Work Authorized -

	Units			Total Cost
	Stage I	Stage II	Stage III	of Project
Access roads and drill sites @ $12.50/hr.	16	8	-	$ 300.00
Non-core drilling @ $1.75/ft.	3600	8400	4000	28,000.00
Core drilling @ $3.50/ft.	940	2060	1400	15,400.00
Radiometric logging @ $0.10/ft.	4460	10460	5400	2,032.00
Incidental allowance @ $0.57/ft.	-	-	-	11,628.00
Chemical Analysis V_2O_5 and U_3O_8 @ $5.00/sample	90	210	100	2,000.00
Total Estimated Cost of Project				$59,360.00
Government Participation @ 75%				$44,520.00

Work Completed -

The Operator completed the 18 holes allowed under Stage I. In a letter, dated April 16, 1956, the Operator requested that, having completed Stage I, the contract be terminated. However, the Field Team recommended that at least part of the drilling under Stage II and Stage III be completed. The Operator refused to do additional drilling and, therefore, the contract was terminated and the project certified on the basis of the ore found under Stage I drilling.

Actual Costs of Project

Bulldozing	None
Core drilling 566½ feet @ $3.50/ft.	$ 1,982.75
Non-core drilling 3,708 feet @ $1.75/ft.	6,489.00
Radiometric logging 3,783 feet @ $0.10/ft.	378.30
Incidental Allowance 4,274½ feet @ $0.57/ft.	2,436.46
Chemical assays, 35 @ $5.00/sample	175.00
Total Cost of Work	$11,461.51*
Government Participation @ 75%	$ 8,596.13

*MF-104 - October 18-November 25, 1955.

Final Reports -

Operator's: MF-104 October 18-November 25, 1955, accepted as its final report - see Mr. Traver's memorandum May 11, 1956.

Field Team's: January 16, 1957, Joint Final Engineering and Geological Report, by W. D. McMillan, USBM, and N. P. Cuppels, USGS, received in Washington February 11, 1957.

3. Audit Report of Review, dated August28, 1956.

Total cost as billed by Contractor	$11,940.92
Exceptions: by DMEA Finance Officer	479.41
Total Accepted Cost	$11,461.51
Government Participation @ 75%	$ ~~8,596.31~~ $8596.13

JMM

4. Certified - May 25, 1956.

Note: Copies of the certification were forwarded to Frank E. Laymon and Anne M. Laymon, signers of an Owner's Consent to Lien, dated August 23, 1955, relating to the subject property.

5. Comments -

Ore bodies in the Black Hills are commonly found in friable sandstones where local unconformaties, irregular cementation, facies changes, or carbonaceous material have provided traps for localization of ore deposition from mineralizing solutions. Data from Stage I drilling indicate that there has been widespread mineralization on the subject property at the stratigraphic intervals in the Lakota sandstone.

The work was started on October 18 and completed November 25, 1955. The Operator notes that core recoveries were disappointing, and in the basal Lakota (potential ore zone) recoveries were so small that their significance was lost. Also, in the basal zone diamond bit life was of very short duration. Therefore, for any future exploration in the subject area the Operator recommended air drilling, dust samples, radiometric logging, and carrying on the drilling during spring and summer months.

Excerpts from final Field Team report, dated January 16, 1957:

Gamma-ray logs of drill holes within the Shannon lease indicate the following ore deposits:

Block	Tons of indicated and inferred ore	% U_3O_8	Lbs. U_3O_8	Value
A	6,174	0.22	27,165	$110,500.00
B	2,525	0.14	7,070	19,750.00
C	886	0.24	4,253	17,550.00
D	737	0.17	2,506	15,800.00
Total	10,322	0.20	40,994	$163,600.00
Initial production bonus @ 0.20% U_3O_8				$ 35,000.00
Total value				$198,600.00

The field examiners, Grand Junction Office, and the Field Team agree that the subject property was inadequately explored and that additional exploration will result in the discovery of significant amounts of uranium ore.

Note: data submitted to AEC with DMEA list of certified projects as of March 31, 1957 FMM

F. M. Murphy

F. M. Murphy

☒ Audited

☒ Certified

WORK ANALYSIS SHEET - DMEA PROJECT

Analysis as of Dec. 20, 1956
Incl. Voucher for Oct.-Nov. 1956

☒ Actual Cost

☐ Agreed Unit Costs

Name Shannon Oil Company

Docket No. 3762

State Wyoming

Commodity Uranium

Idm-E No. E 870

OPERATION	AUTHORIZED Units	AUTHORIZED Cost	COMPLETED Units	COMPLETED Cost	NET COST
Drifting & Crosscutting					
Raising					
Shafts					
Winzes					
Drilling (Specify) Non-Core	16000	37,106.67	3708	8365.51	8365.51
Core	4400	19,953.33	566½	2921.00	2921.00
Surface Excavation					
Underground Excavation					
Roads and Trails		300.00		—	
Operating Equipment Purchased					
Surface Rehabilitation & Repairs					
Underground Rehabilitation					
New Building, Improvements, etc.					
Other (Specify) Analyses U_3O_8 V_2O_5		2000.00		175.00	175.00
Totals		$ 59,360.00		$ 11,461.51	11,461.51

Prepared by Fay Murphy

7162

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
2/26	Talbert	800
2/26	Murphy	500
	Hugins	500
2/26	Selfridge	130
"	Johnson	110
2-27	Farah	100
		220

FEB 26 1962

Memorandum

To: Acting Field Officer, Region III

From: Chief, Division of Field Operations

Subject: DMEA-4889 (Uranium)
Balboa Mining and Development Company
Laymon Property
Crook County, Wyoming
Contract Idm-81178
and
DMEA-3762 (Uranium)
Shannon Oil Company
Laymon Property
Crook County, Wyoming
Contract Idm-8870

The Department's Fiscal Section has advised that the $1,124.05 refund referred to in your February 23 memorandum was scheduled to the disbursing office during the past week. The Operator undoubtedly is now in receipt of the refund.

The delay in making this refund is regretted. Apparently, the Operator's claim was misplaced and only recently came to light.

George C. Selfridge

(2/62)

EDTalbert/ama 2-26-62

cc:
Docket - DMEA-3762 memoed in 4889
Director's Reading File
CA & A Division
Review Committee

43683

MME Form 7
(10-59)

Balboa Mining and Development Company
P. O. Box 861
Grand Junction, Colorado

Re: DME-[illegible] (Uranium)
Shannon Oil Company
Laramie County
Crook County
Contract [illegible]

DME-[illegible] (Uranium)
Balboa Mining and Development Company
Laramie County
Crook County
Contract [illegible]

Gentlemen:

Not only do we appreciate your interest and participation [illegible] we believe that your success warrants some publicity. Unless you have some objection, we plan to use the following statement to the press for release on February [illegible].

Repayment Completed on Exploration Assistance Contracts

The Balboa Mining and Development Company has completed repayment of $5,066.03 under an exploration assistance contract administered by the Office of Minerals Exploration [illegible] under a contract held by the Shannon Oil Company. The Department of the Interior announced today. Both [illegible] provided for assistance to explore for uranium in Crook County, Wyoming.

According to George Fumich, Jr., Director of the Office of Minerals Exploration, the Shannon Oil Company [illegible] with the Bureau of Minerals Exploration Administration [illegible] for the exploration assistance and completed the work [illegible]. The Balboa Mining and Development Company under its contract performed additional exploration work on the same property [illegible].

Sincerely yours,

Director

ASBakan:hlb 1/18/62
cc: Dir. Reading File

January 17, 1962

See Docket DMEA-4889 Balboa Mining and Development Company for copies of letters to parties in this docket re full repayment of royalties.

Building 20 - Federal Center
Denver 25, Colorado

December 7, 1961

Memorandum

To: Fiscal Section, Division of Administrative Services
Office of the Secretary, Department of the Interior
Washington 25, D. C.

From: Acting Field Officer, OME, Region III

Subject: [redacted]-4889 (Uranium)
Contract Ilm-10178
Balboa Mining & Development Co.
(Ingram Property)
Crook County, Wyoming
and
[redacted]-3762 (Uranium)
Contract Ilm-10170
Shannon Oil Company
(Ingram Lease)
Crook County, Wyoming

Attached is a letter from T. Sanders of the Balboa Mining and Development Company dated December 4, 1961, requesting refund of $1,124.03, the amount the Government's contribution on the subject contracts has been overpaid.

Will you please send the Balboa Mining and Development Company a check for $1,124.03.

Hugh M. Connors

Attachment
[illegible]

Balboa Mining and Development Company
[illegible] Box 861
Grand Junction, Colorado

December 4, 1961

Office of Minerals Exploration
Building 20-Federal Center
Denver 25, Colorado

Attention: Mr. Hugh M. Connors

Re: DMEA - 4889 (Uranium
Contract Idm-E1178
Balboa Mining & Development Co.
(Laymon Property)
Crook County, Wyoming
and
DMEA - 3762 (Uranium)
Contract Idm-E870
Shannon Oil Company
(Laymon Lease)
Crook County, Wyoming

Dear Sir:

We have received a copy of your letter to Mr. Ron Kahler of Mines Development, Inc. directing that no more royalty be withheld from uranium ore production by Balboa Mining and Development Company from the above lease.

We therefore, make application for refund on the overpayment of $1,124.05. This would be royalty payment through Liquidation # 2757. No royalty has been withheld from that time.

Very truly yours,

BALBOA MINING AND DEVELOPMENT CO.

T Sanders
T. Sanders

TS/mh

Official

EXTRA COPY
O. M. E.
RECEIVED NOV 30 1961

DATE		CODE
		220
Off	Mining	320
		220

Building 20 - Federal Center
Denver 25, Colorado

November 28, 1961

Mr. Ron Kahler
Mines Development Inc.
777 Grant Street
Denver 3, Colorado

Re: DMEA-4889 (Uranium)
Contract Idm-E1178
Balboa Mining & Development Co.
(Laymon Property)
Crook County, Wyoming
and
DMEA-5762 (Uranium)
Contract Idm-E870
Shannon Oil Company
(Laymon Lease)
Crook County, Wyoming

Dear Mr. Kahler:

This has further reference to our telephone conversation this morning regarding the captioned contracts.

This will confirm the Operator's statement to you that the royalty account has been paid in full and you should cease to withhold further royalty payments for the Government.

Yours very truly,

Original signed by

Hugh M. Cummers
Acting Field Officer, OME
Region III

cc Balboa Mining and Development Company
Post Office Box 361
Grand Junction, Colorado

HMC/lm
Chief, Division of Field Operations, OME (2)
Idm E1178
Idm E870
Chron

Building 20 - Federal Center
Denver 25, Colorado

November [illegible], 1961

Balboa Mining and Development Company
Post Office Box 861
Grand Junction, Colorado

Attention: Mr. T. Sanders

Re: DMEA-4089 (Uranium)
Contract Idm-W1173
Balboa Mining & Development Co.
(Layman Property)
Crook County, Wyoming
and
DMEA-3762 (Uranium)
Contract Idm-W870
Shannon Oil Company
(Layman Lease)
Crook County, Wyoming

Gentlemen:

Please be advised that the Government's contribution on the captioned contracts was overpaid by $1,124.05 when the payment of the royalty of $149.29 on liquidation no. [illegible] was received.

Will you please advise the buyers of your ore that the Government's participation has been repaid in full and to discontinue withholding the royalty on your future shipments of ore.

If you will make claim to this office for the amount of overpayment, which is now $1,124.05, that amount will be refunded to you.

I am sorry that I wasn't aware of this overpayment at an earlier date but your October shipments were so numerous that the amount of Government participation was exceeded before I realized it.

Very truly,

Ralph M. Connors
Acting Field Officer, OMT
Region III

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
10/30	Talbot	800
10/31	Murphy	500
	Brown	500
10/31	GCS	130
		110
10/31	Fenwick	100
		220

OCT 3 1 1961

Memorandum

To: Acting Field Officer, Region III

From: Chief, Division of Field Operations

Subject: DMEA-4889 (Uranium)
Balboa Mining & Development Co.
Laymon Property
Crook County, Wyoming
Contract Idm-E1178
and
DMEA-3762 (Uranium)
Shannon Oil Company
Laymon Lease
Crook County, Wyoming
Contract Idm-E870

Your Abstract of Remittances '61-10-5 includes the receipt on October 23, 1961, of $186.74 as royalty under the subject contracts. The posting of this royalty receipt resulted in an overpayment by $70.71 of the Government's total contribution of $13,662.16 under the two contracts.

We have now received copies of Abstract of Remittances '61-10-6, which includes an aggregate of $1,055.34 received on October 27, 1961, as royalty for credit to these contracts. Accordingly, the Government's contribution has been overpaid by $1,124.05 as of this date.

Please advise the Operator that royalty payments under these contracts should be discontinued and that refund will be made upon receipt of its claim for the excess amounts.

/s/ George C. Selfridge

EDTalbert/ama
October 30, 1961

Copy to: Docket - DMEA-3762
Director's Reading File
CA & A Division
Review Committee
Mr. Rothrock

43683

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
7/25	Talbert	800
7/25	Murphy	500
7/25	Fromnel	500
7/25	Jeffredge	120
"	Johnson	110
7/25	Fumich	100
		220

JUL 2 5 1961

Balboa Mining and Development
Company
Post Office Box 861
Grand Junction, Colorado

Attention: Mr. T. Sanders

Re: DMEA-4889 (Uranium)
Balboa Mining & Development Co.
Laymon Property
Crook County, Wyoming
Contract Idm-E1178
and
DMEA-3762 (Uranium)
Shannon Oil Company
Laymon Lease
Crook County, Wyoming
Contract Idm-E870

Gentlemen:

In reply to your July 20 letter, you are advised that the balance payable to the Government under the first referenced contract is $2,572.74 after application of the royalty paid on Mines Development, Inc., liquidation number 2658. This balance is computed as follows:

Government's contribution repayable

Contract Idm-E1178	$5,066.03	
" Idm-E870	8,596.13	$13,662.16
Royalty paid through June 30, 1961		11,089.42
Balance payable		$ 2,572.74

Since June 30, royalty of $127.64 applicable to liquidation number 2662 has been received. Accordingly, the balance as of this date is $2,445.10 according to our records.

Sincerely yours,

George Fumich, Jr.

Director

Region III (2)
CA&A Division (2)

EDTalbert/hb (7/24/61)
Copy to: Docket DMEA-4889
Docket DMEA-3762
Director's Reading File

43683

Balboa Mining and Development Company
P. O. Box 861
Grand Junction, Colorado

July , 1961

Mr. George Fumich, Jr.
Director O M E
Department of the Interior
Washington 25, D. C.

Gentlemen:

Would you please verify the balance of royalty due the Government under the following captioned contract:

Docket DMEA-4[illegible]9 (Uranium)
Contract IDM [illegible]178
Balboa Mining & Development Company
(Laymon Property)
Crook County, Wyoming.

This would be the balance due through liquidation number 2658.

Yours very truly,

Balboa Mining & Development Co.

T. Sanders

OFFICIAL FILE COPY
O. M. E.
RECEIVED APR 11 1960

DATE	INITIAL	TIME
4-11	gal	1110
4	[illegible]	800
4	[illegible]	800

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION

Building 50 - Federal Center
Denver 25, Colorado

April 7, 1960

Memorandum

To: Chairman, Operating Committee, OME

From: Executive Officer, OME Field Team, Region III

Subject: Statement in Lieu of Annual Report of Certified Project.

Enclosed are the original and two copies of the following subject reports for the period January 1, 1959 through December 31, 1959:

DMEA Docket 4049
Contract No. DE175 (Uranium)
Hunter Lucy Company
(Give list of all claims)
Big Horn County, Wyoming

DMEA Docket 3768
Contract No. Dme-2870 (Uranium)
Shannon Hill Co. (Keyport Mines)
Carbon County, Wyoming

J. W. Sandoval

Attachments

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION
Building 20 - Federal Center
Denver 25, Colorado

February 9, 1960

OFFICIAL FILE COPY
O. M. E.
RECEIVED FEB 12 1960

DATE	INITIALS	CODE
2-12	gad	220
2/12	[illegible]	800
"	~~Murphy~~	~~800~~
		225

Balboa Mining & Development Co.
P. O. Box 601
Grand Junction, Colorado

Re: Docket No. [illegible] (Uranium)
Contract No. [illegible]
Sheraton Oil Company
(Lagron Lease)
Crook County, Wyoming

Gentlemen:

In reference to the "Certification by the United States of America of a Discovery or Development under an exploration Project Contract" and the instructions in the Washington Office letter of transmittal of the Certification on the captioned project, please indicate your answer to the following questions and return one copy of the questionnaire immediately to this office.

Very truly yours,

Original signed by

J. W. Townsend
Executive Officer, OME
Field Team, Region III

1. Has the property been sub-leased or any change made in ownership other than this office has been notified? Yes ___ No___. If yes, please furnish details of the transaction on a separate sheet and include a true or signed copy of any instrument that was executed in conjunction with the matter.

2. Has there been production from the land subordinated under the referenced contract since January 1, 1959 ? Yes___ No___. If yes, and shipments made, who was the purchaser? _____

3. Is any of the following material stockpiled? Yes___ No___.

(a) Ore, Tons _____ Estimated grade _____
(b) Concentrates, lbs. _____ Estimated grade _____
(c) Low grade ore, tons _____ Estimated grade _____
Place stockpiled _____

Signed _____

Title _____ Date _____

HMC:ltm cc: Chmn. Op. Comm. ✓ Roy. Corres. E870 Chron.

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
6/22	Alley	800
"	"	220
		700
		225

JUN 22 1959

Memorandum

To: Mr. Donald T. Finch, OME Auditor

From: E. D. Talbert, Acting Chief (Signed) E. D. Talbert
Contract Administration and Audit Division

Subject: Docket No. DMEA-3762 (Uranium)
Shannon Oil Company
Contract No. Idm-E870

Your Report of Royalty Review on the subject contract is acceptable and distribution of the regional copies is authorized after changing "Shanon" to "Shannon" in the fourth line of the first paragraph. This correction has been made in the Washington copies.

EMAlley/ama
June 22, 1959

Copies to: Docket
Director's Reading File
Code 800

43683

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
3/2/59	Murphy	700
3/2	Lubinski	700
	Parker	140
	Holland	140
3-6	Chambers	800
3/6	GCS	130
3/6	Johnson	110
3/9	C	~~100~~ 220 225

March 2, 1959

Memorandum

To: Executive Officer, OME Field Team, Region III

From: Chairman, Operating Committee, OME

Subject: Docket No. DMEA-3762 (Uranium)
Contract No. Idm-E870
Shannon Oil Company
Laymon Lease
Crook County, Wyoming
and
Docket No. DMEA-4889 (Uranium)
Contract No. Idm-E1178
Balboa Mining and Development Company
Laymon Property
Crook County, Wyoming

In reply to your memorandum of February 25, 1959, this is to advise you that the above property is carried under both contract numbers for record purposes.

Annex II of Contract Idm-E1178 adds the sum contributed by the Government under Contract Idm-E870 to the costs repayable to the Government. However, Shannon Oil Company remains liable for the amount contributed by the Government under Contract Idm-E870 if Balboa Mining and Development Company does not reimburse the full amount under the terms of both contracts to the Government. Because of these conditions the contracts are filed under their individual numbers.

George C. Selfridge

George C. Selfridge
Chairman, Operating Committee

APPROVED:

H. G. Iverson
Member, Bureau of Mines

N. E. Nelson
Member, Geological Survey

FMMurphy/gla
3-2-59
cc to: Director's Reading File
Operating Committee
FMMurphy
Dockets: DMEA-3762
DMEA-4889

43683

official DMEA-3762

~~EXTRA COPY~~

O. M. E.

RECEIVED MAR 2 1959

DATE	INITIALS	CODE

224 New Customhouse
Denver 2, Colorado

February 25, 1959

Memorandum

To: Chairman, Operating Committee OME

From: Executive Officer, OME Field Team, Region III

Subject: Docket DMEA 3762 (Uranium), Contract Idm-E870, Shannon Oil Company (Laymon Lease), Crook County, Wyoming, and

Docket No. DMEA 4889 (Uranium), Contract Idm-K1178, Balboa Mining & Development Company (Laymon Property), Crook County, Wyoming

Both of the captioned contracts include the same land covered by the Laymon lease, and the amount contributed by the Government, $13,662.16 includes all the money contributed by the Government under both contracts.

Will you please advise if you carry this property under two contracts or one contract for record purposes.

J. W. Townsend

JWC/ff

cc: Harshman
Marshall
Contract file, E870
Contract file, K1178
Chron.

3762

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

Mr. William M. Spencer, President
Balboa Mining and Development Company
Post Office Box 861
Grand Junction, Colorado

Re: Docket No. DMEA-4869 (Uranium)
Layson Property
Crook County, Wyoming

Dear Mr. Spencer:

Under Docket No. DMEA-3762, Contract No. Lbn-2670 between the Government and Shannon Oil Company, a Consent to Lien and Subordination Agreement signed by the lessors of the subject property, Frank E. and Anna M. Layson, is an integral part of the contract. However, in the event your above-referenced application results in a contract we will require another Consent to Lien and Subordination Agreement signed by the same lessors.

Enclosed are six Consent to Lien and Subordination Agreement forms MF-205 prepared for execution and insertion of their addresses by the lessors. Please submit five executed copies; the lessors may retain one copy. Although our request does not imply that a contract has been approved, early submission of the executed forms will expedite the processing of your application.

Also, in the event a contract is approved, it will contain a provision obligating your company to assume and to pay the royalty due from Shannon Oil Company in the amount of $8,596.13. Notwithstanding this provision DMEA will not release Shannon Oil Company from its liability. We are enclosing a self-explanatory letter of this date to the latter company relating to this possible provision.

Sincerely yours,

Frank E. Johnson

ACTING Administrator

FMMurphy/izm 1-7-58
cc: Mr. Murphy
Admr.'s Reading File
DMEA FT Reg. 3 (2)
Docket No. DMEA -3762
THKiilsgaard, 522h

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
1-7	Murphy	700
1-7	Ellis	700
	Sawyer	
		~~110~~
		~~400~~
1/9	gb	220
		700

INTERIOR DEPT.

JAN 7 - 1958

SOLICITOR

JAN 8 1958

Mr. R. S. Shannon, Jr., General Partner
Shannon Oil Company
603 Midland Savings Building
Denver 2, Colorado

Re: Docket No. DMEA-3762 (Uranium)
Contract No. Idm-L870
Laymon Lease
Crook County, Wyoming

Dear Mr. Shannon:

This is with reference to an application (Docket No. DMEA-4889) for aid in an exploration project submitted by Balboa Mining and Development Company.

The application includes an assignment of the Laymon lease wherein the Applicant assumes Shannon Oil Company's royalty obligations under DMEA Contract No. Idm-L870.

We wish to advise you that despite Balboa Mining and Development Company's assumption of the royalty obligation, in the event a contract results from its application for aid, DMEA will not release Shannon Oil Company from such liability.

Sincerely yours,

Frank E. Johnson (for)

ACTING Administrator

FMMurphy/izm 1-7-58
cc: Mr. Murphy
Admr.'s Reading File
DMEA Docket No. 4889
DMEA FT Reg. 3 (2)
THKiilsgaard, 5224

Copy to: Mr. Spencer, Balboa Mining and Development Company

RECEIVED
JAN 8 1958
ASSOC. SOLICITOR
MINERAL RESOURCES

8623

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
WASHINGTON 25, D. C.

JAN 6 1958

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: Chief, Division of Rare and Miscellaneous Metals

From: Associate Solicitor, Division of Mineral Resources

Subject: Application DMEA-~~4779~~ 4889 (Uranium)
Balboa Mining and Development Company
Laymon Property
Crooks County, Wyoming

Pursuant to Mr. Ellis' request, we have examined the documents regarding the above application. In order to insure the Government's right to royalties arising from the second contract, another consent to lien should be obtained from the lessors of the mineral rights, Frank E. and Anna M. Laymon.

In the event a contract is prepared, a provision should be included obligating the applicant to assume and to pay the royalty due from Shannon Oil Company in the amount of $8,596.13. A letter should also be directed to the latter company advising it, that despite Balboa's assumption of Shannon's royalty obligations under DMEA Contract No. Idm-E870 as provided in the assignment of lease, DMEA does not release Shannon from such liability.

Robert P. Dwyer

Robert P. Dwyer

X reference
for 3762

OFFICIAL FILE COPY
O. M. E.
RECEIVE APR 13 1959

DATE	INITIALS	CODE
4/13	C	220
"	JM	110
"	EJ	800
~~4/14/59~~	~~Murphy~~	~~700~~
		~~225~~
		~~[illegible]~~
		225

UNITED STATES
DEPARTMENT OF THE INTERIOR
Office of Minerals Exploration
224 New Customhouse
Denver 2, Colorado

April 6, 1959

Memorandum

To: Chairman, Operating Committee, OME

From: Executive Officer, OME Field Team, Region III

Subject: Semiannual Report of Certified Project for the period July 1, 1958 through December 31, 1958

DMEA Docket 3762 (Uranium)
Contract Idm-E 870
Shannon Oil Company
Crook County, Wyoming

Enclosed are the original and three copies of the subject report prepared in conformance with instructions contained in memorandum of January 6, 1956 from this office, Memorandum 29, and Special Notice in Minutes of Operating Committee Meeting No. 692.

J. W. Townsend

J. W. Townsend

Enclosures
HMC/ff

cc: Semiannual Report File Idm-E 870
Harshman
Marshall
Chron.

DMEA, REGION III

Statement in Lieu of Semiannual Report

Reporting Period	July 1, 1958 - December 31, 1958
Docket and Contract Number	DMEA 3762, Contract Idm-E870 (Uranium)
Operator	Shannon Oil Company , Crook County, Wyoming

The project has been inactive during the reporting period ☐

Pertinent data relative to the subject contract has remained unchanged since the last report ☒

Remarks:

1. Property inspected March 25, 1959
2. Exploration conducted under DMEA Contract Idm-E1178 was completed December 2, 1958 with an increase of reserves from 10,322 tons of indicated and inferred reserves assaying 0.20 percent U_3O_8 to present total estimate of 15,500 tons of indicated reserves assaying 0.27 percent U_3O_8 and 38,000 tons of inferred reserves assaying 0.28 percent U_3O_8.
3. It was learned that Mines Development Inc., is interested in the property but nothing official has transpired.
4. No stockpiling or mining has been attempted to date.
   Note: See also E1178
5. The Government contributed $8,596.13 under contract E870; Shannon Oil assumed responsibility.
6. Balboa Mining & Development Co. under Contract E1178 did additional work at a cost to the Government of $5,066.03.
7. The subordinated land is the same in both contracts and consists of approximately 160 acres covering the E½ of the NW¼ and the W½ of the NE¼ of Sec. 27, T. 52 N., R. 66 W.

Signed M. H. Marshall

M. H. Marshall

Date 4-3-59

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
8/23	Rubin	140
8/26	Murphy	700
8/26	Ellis	700
"	Johnson	110
"	Mittendorf	100
8/26	P	220

hjm 700
225

AUG 26 1957

Mr. William M. Spencer
Balboa Mining and Development Company
P. O. Box 861
Grand Junction, Colorado

Re: Docket No. DMEA-3762 (Uranium)
Shannon Oil Company
Laymon Property
Crook County, Wyoming
Contract No. Idm-E870

Dear Mr. Spencer:

Your letter dated August 14, 1957, addressed to Mr. Harshman, relating to the possible re-opening of the above-referenced contract, has been referred to this office for reply.

As you are aware, a "Certification by the United States of America of a Discovery or Development under an Exploration Project Contract," was issued after the completion of the work under Stage I, and the contract was terminated by mutual consent on August 20, 1956.

We prefer not to re-open the subject contract. However, if you submit an application for aid in further exploring the land, it will receive prompt attention, as we already have had some experience with the property.

In the event a new application is submitted it need not duplicate the material available in the present docket. However, it should include the new work proposed, a map showing the location thereof, the estimated cost of the work, and bids from three independent contractors for the drilling; also, at least two copies of the sublease should be submitted.

Enclosed are five copies, one extra, of our application form. Please submit four copies of the suggested supplementary information mentioned above.

Sincerely yours,

G. O. Mittendorf (fw)

Administrator

FROM SOLICITOR
AUG 26 1957
FOR SIGNATURE

HCRubin/emd 8/23/57
Copy to: DMEA Docket
Adm. Reading File
E. W. Ellis
Field Team, Reg. II (2)
J. E. Crawford
T. H. Kiilsgaard

Enclosures 5
J. D. Hosted, Rm. 3210, GSA
Mr. Dwyer
Mr. Rubin

8623

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
224 New Customhouse
Denver 2, Colorado

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 19 1957

DATE		CODE
8/19	P	220
"	FMM	700

August 16, 1957

Memorandum

To: Chairman, Operating Committee, DMEA

From: Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket No. DMEA 3762 (Uranium), Contract No. Idm-E870, Shannon Oil Company (Laymon Property), Crook County, Wyoming

Enclosed are the original and two copies of a letter, dated August 14, 1957, from William M. Spencer, Balboa Mining and Development Company, wherein he inquires if it will be possible to reopen the Contract to continue with Phase II.

Also enclosed are three copies of a letter from this office to Mr. Spencer, acknowledging receipt of his letter of August 14 and advising of the disposition thereof.

Inasmuch as it is stated that the reopening of the Contract would probably involve revised location of the holes, with amended costs, it appears that DMEA policy is involved. Therefore, the matter is forwarded for your consideration and appropriate action by reply direct to Mr. Spencer.

E. N. Harshman

E. N. Harshman

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 19 1957
DATE | CODE

224 New Customhouse
Denver 2, Colorado

August 16, 1957

Mr. William M. Spencer
Balboa Mining and Development Company
P. O. Box 861
Grand Junction, Colorado

Re: Docket No. DMEA 3762 (Uranium)
Contract No. Idm-E870
Shannon Oil Company
(Layman Property)
Crook County, Wyoming

Dear Mr. Spencer:

A decision relative to the reopening of Contract No. Idm-E870 is not within the authority delegated to this office. Therefore, your letter of August 14, 1957 has been forwarded to the Washington Office, DMEA, for their consideration and appropriate action, by reply direct to you as to your inquiry.

Very truly yours,
Original signed by
E. N. HARSHMAN

E. N. Harshman
Acting Executive Officer
DMEA Field Team, Region III

JWT:prl

cc: Chmn. Op. Comm. - 3
Harshman
Townsend
Corres. file
Chron.

WC.

Balboa Mining and Development Company
Post Office Box 861
Grand Junction, Colorado

August 14, 1957

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 19 1957
DATE
CODE

DMEA
DEPARTMENT OF THE INTERIOR
AUG 15 1957
REGION III
DENVER, COLORADO

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

Dear Mr. Harshman:

We write in reference to DMEA 3762, Contract Idm-E 870 with Shannon Oil Company dated September 14, 1955.

We recently reviewed Shannon Oil Company's file on this project. We noted that Shannon completed phase 1 of the drilling program but that no drilling was accomplished under phase 2. We also noted that this was contrary to the Government's advice and request and that the DMEA expressed the strong desire that Shannon continue the program. However, despite the Government's urging the contract was terminated at the conclusion of phase 1. A discovery was certified on the property.

We write to inquire if it is possible to re-open the contract and to continue with phase 2? It is possible that Balboa might consider leasing the property from Shannon Oil Company in order to continue the exploration program. If we can determine that the old DMEA project could be continued into phase 2, then there would be a serious possibility that we might proceed with further negotiations.

The re-opening of the contract, probably with amended costs and revised placement of holes, would enable us to expedite a drilling program and to avoid time delays involved in application four and obtaining approval of a new DMEA loan. We also suggest that this procedure would be to the best interest of the Government in that it would increase the chance of eventual production resulting from this acreage.

Your reply will be appreciated. We request that you keep the contents of this letter as confidential as possible at this time.

Yours very truly,

BALBOA MINING AND DEVELOPMENT CO.

William M Spencer

William M. Spencer

WMS:b
cc: Al Stoick

OFFICIAL FILE COPY
DMEA
RECEIVED FEB 18 1957

DATE	INITIALS	CODE
2/18	C	220
		225

February 15, 1957

3762
Idm-E870
Uranium
Shannon Oil Company
Laymon Property
Crook County, Wyoming
$11,461.51

Ernest William Ellis, DMEA Member
Uranium Commodity Committee
John E. Crawford, Bureau of Mines Member
Uranium Commodity Committee

Final Report

1/16/57 2/14/57

x on subst

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

Reviewed by
DMEA OPERATING COMMITTEE
2-15-57
(date)

224 New Customhouse
Denver 2, Colorado

February 5, 1957

Memorandum

To: Chairman, Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Docket No. DMEA-3762 (Uranium), Contract No. Idm-E870
Shannon Oil Company (Laymon Property), Crook County, Wyoming
FINAL REPORT

Enclosed are the original and three copies of a joint final engineering and geologic report dated January 16, 1957, by W. D. McMillan, Mining Engineer, Bureau of Mines, and N. P. Cuppels, Geologist, Geological Survey, and transmittal thereof dated January 18, 1957 from John F. Shaw and E. N. Harshman.

The Operator's narrative report accompanying Form MF-104, Operator's Monthly Report and Voucher, for the period from October 18, 1955 through November 25, 1955, is considered adequate as the Operator's final report required by the contract.

The contract was terminated effective May 25, 1956 by Termination Agreement executed by the Operator and the Government August 20, 1956.

The work completed consisted of 566.5 feet of core drilling and 3,708 feet of non-core drilling at a total accepted cost of $11,461.51, toward which the Government contributed 75 percent, or an amount of $8,596.13.

Final payment to the Operator was processed September 6, 1956 in conformance with the Report of Review of reported project costs by the Contract Administration and Audit Division, DMEA, dated August 28, 1956.

The exploration work completed resulted in a discovery or development of significant quantity of uranium ore, of which the certification was issued May 25, 1956.

See Folder #2 for maps

DATE	INITIALS	CODE
2/12		220
2/15		130
1/16		160

OFFICIAL FILE COPY
DMEA
RECEIVED FEB 11 1957

DMEA Field Team, Region III

W. M. Traver

E. N. Harshman

FT. FINAL Report

IN REPLY REFER TO:

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

DMEA
DEPARTMENT OF THE INTERIOR
JAN 21 1957
REGION III
DENVER, COLORADO

January 18, 1957

Memorandum

Reviewed by
DMEA OPERATING COMMITTEE
2-15-57
(date)

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shaw
E. N. Harshman

Subject: DMEA Docket 3762 (Uranium), Contract Idm-E870, Shannon Oil Company (Laymon property) Crook County, Wyoming

Enclosed are the original and nine copies of a joint final report which describes the results of exploration under the subject contract.

The contractor completed the 18 holes authorized under Stage I of the contract at a total cost of $11,461.51, Government participation 75 percent was $8,596.13.

Reserves resulting from the Stage I drilling are estimated to be 10,322 tons of indicated and inferred ore containing 0.20 percent U_3O_8 with a gross value (including bonus and allowances) of $198,600.

Stage II work was not undertaken and at the operator's request the contract was terminated on May 25, 1956, and a Certificate of Discovery was issued.

It is the opinion of the examining team, and we concur, that the property was inadequately explored and that additional exploration will result in the discovery of significant amounts of uranium ore.

OFFICIAL FILE COPY
DMEA
RECEIVED FEB 11 1957

DATE	INITIALS	CODE
		130
		220

John F. Shaw
Supervising Mining Engineer

E. N. Harshman
Member, Field Team

Enclosures (10)

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

OFFICIAL FILE COPY
DMEA
RECEIVED FEB 1 1957
DATE | INITIALS | CODE
130
220

DMEA 3762

Contract Idm-E870

Shannon Oil Company

Laymon property

Crook County, Wyoming

Reviewed by
DMEA OPERATING COMMITTEE
2-15-57
(date)

Uranium

Joint Final Engineering and Geological Report
by

W. D. McMillan, Mining Engineer
Bureau of Mines

N. P. Cuppels, Geologist
Geological Survey

January 16, 1957

CONTENTS

Page

Introduction and summary..... 1

Location, topography, and climate..... 3

History, production, and ownership..... 3

Geology and description of the property..... 4

Mineralization..... 5

The project..... 8

Ore reserves..... 10

Ore calculations..... 11

Summary of factual data..... 13

Operator's final report..... 13

Conclusions and recommendations..... 13

TABLE

Page

1. Summary of drill hole data..... 9

ILLUSTRATIONS

Figure		Follows Page
1.	Location map, Laymon property, Shannon Oil Company, Crook County, Wyoming. DMEA 3762	3
2.	Location of drill holes and ore blocks, Shannon Oil Company, Laymon property, Crook County, Wyoming. DMEA 3762	15
3.	Fence diagram showing stratigraphy of the Inyan Kara group	15
4.	Index map showing location of the fence diagram of figure 3	15
5.	Subsurface anomalous radioactivity and isoliths of sandstone in the Lakota formation	15

OFFICIAL FILE COPY
DMEA
NOVEMBER 11, 1957
DATE | INITIAL | CODE

DMEA 3762

Contract Idm-E870

SHANNON OIL COMPANY
LAYMON PROPERTY
CROOK COUNTY, WYOMING

INTRODUCTION AND SUMMARY

Shannon Oil Company, 603 Midland Savings Building, Denver 2, Colorado, applied to the Defense Minerals Exploration Administration for assistance to explore for uranium ore on their Laymon lease in Crook County, Wyoming.

The applicant proposed to drill 107 holes by plug- and core-bit drilling. The drilling was to be done in two stages and consist of 20,945 feet of plug-bit drilling, and 3,580 feet of core-bit drilling, to be accomplished at an estimated cost of $88,932. Government participation, at 75 percent, would have been $66,699.

A joint field examination was made on May 19, 1956, by a Region III examining team, consisting of E. O. Binyon of the U. S. Bureau of Mines, and N. P. Cuppels of the U. S. Geological Survey. They were accompanied by the applicant's representative, Glenn W. Pryor, and Lawrence Gorman, staff geologist from the U. S. Atomic Energy Commission's Hot Springs, South Dakota, office.

After evaluating the available data, the examining team concluded that the proposed exploration program was too elaborate, and they proposed a modified program which was incorporated in Contract Idm-E870

dated September 14, 1955. This program provided for 80 holes to be drilled in three stages, the drilling to consist of 16,000 feet of non-core drilling and 3,000 feet of core drilling estimated to cost a total of $59,360. Government participation at 75 percent was $44,520.

Stage I, which, according to the contract, would consist of drilling 18 holes, requiring an estimated 3,600 feet of non-core and 940 feet of core drilling, was completed on October 18, 1955. The footage paid for was 3,708 feet of non-core and 566.5 feet of core drilling. The holes were drilled at the locations specified in the contract. Significant ore-grade uranium mineralization was found in five holes. No Stage II work was undertaken by the operator.

The drilling program under Stage I of this contract resulted in a discovery of 10,322 tons of inferred and indicated ore with a weighted average grade of 0.20 percent U_3O_8. Although this ore cannot be mined at a profit, geologic interpretation of data derived from Stage I drilling supports the belief that this property probably contains significant amounts of ore.

At the operator's request, the contract was terminated on May 25, 1956, and a Certificate of Discovery was issued. The operator's MF-104 report for October and November 1956 was accepted as a final project report.

LOCATION, TOPOGRAPHY AND CLIMATE

The Laymon property is the E 1/2 NW 1/4 and W 1/2 NE 1/4, sec. 27, T. 52 N., R. 66 W., 6th P.M., Crook County, Wyoming. The property is reached from Sundance, Wyoming, by traveling west on U. S. Highway 14, for 26 miles. It can also be reached from Moorcroft, Wyoming, by traveling northeast on U. S. Highway 14, for 17 miles. Moorcroft, Wyoming, is a station on the Chicago, Burlington and Quincy Railroad, and is the nearest residence and small supply center.

The property is on cultivated land near the center of a mesa known as Thorn Ridge. The mesa slopes gently to the west; it has a mean altitude of about 4,375 feet and a maximum relief of 500 feet.

The climate is typical of the northwestern plains. It is generally moderate except for two or three months during the winter and early spring, when operations may be hampered by cold, heavy snow, and rain storms.

HISTORY, PRODUCTION, AND OWNERSHIP

During the summer and fall of 1954, the U. S. Atomic Energy Commission's exploration branch drilled 27 holes on the Laymon property. Total drilling was 7,361 feet; the average depth, 273 feet. Six holes encountered significant uranium mineralization. This was the only work done on the property, prior to the contract, and there has been no ore production.

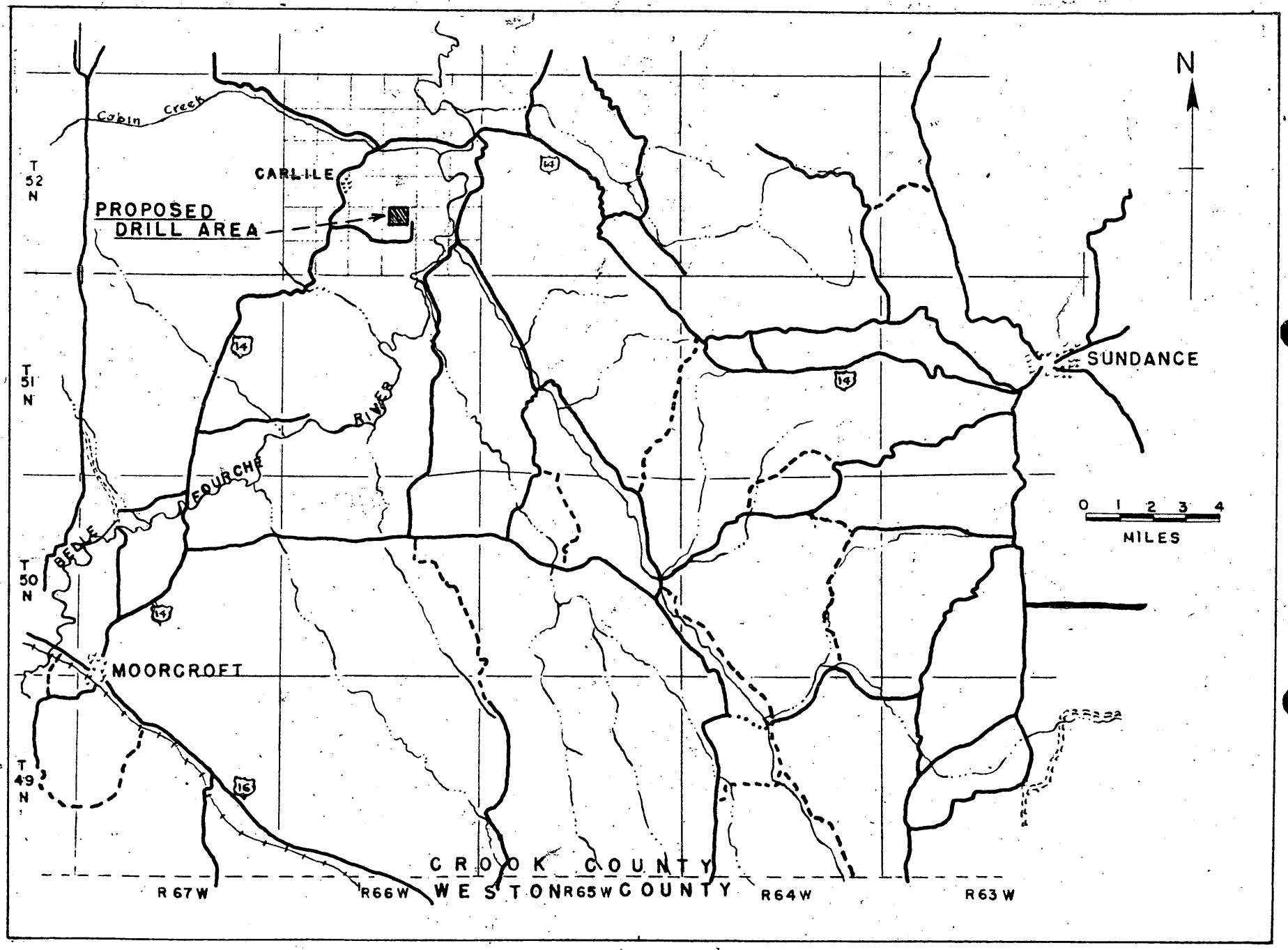


FIG. I LOCATION MAP, LAYMON PROPERTY, SHANNON OIL COMPANY, CROOK COUNTY, WYOMING, (DMEA 3762)

The applicant holds a 5-year lease on the surface rights under an agreement with the owner, Edwin F. Thorn of Crook County, Wyoming, and a 10-year lease on the mineral rights under a mining lease with Frank E. and Anna M. Laymon of 584 E. 8th Street, Sheridan, Wyoming. The lease agreements provide for extensions of time if there is production from the property.

GEOLOGY AND DESCRIPTION OF THE PROPERTY

The Shannon Lease is located on Thorn Ridge in the northwestern part of the Black Hills of Wyoming. The "ridge" is actually a mesa roughly 3 miles long, nearly as wide, and with an average relief of about 200 feet. Altitudes in the area range from 4,400 feet on top of the mesa to 3,950 feet in the channel of the Belle Fourche River, which flows northward along the east side of the mesa. The mesa is capped by the Fall River sandstone of the lower Cretaceous Inyan Kara group. In order of increasing age, the Inyan Kara group consists of the Fall River sandstone, Fuson formation, and Lakota sandstone. The Morrison formation, which underlies the Lakota sandstone, has been exposed by erosion in the valley of the Belle Fourche River. There are no rock outcrops within the leased area. All subsurface data have been compiled from the results of an A.E.C. drilling program carried out during the summer and fall of 1954 and Stage I drilling under this contract.

Stratigraphy of the Inyan Kara group is shown on figure 3. The Inyan Kara group has an average thickness of about 240 feet and consists chiefly of fluviatile sediments which accounts for the abrupt facies changes - particularly within the component formations. Pyrite is abundant in many parts of the section and accounts for the gray to green colors of the sediments which are indicative of a reducing chemical environment. Average thickness of the Fall River sandstone is about 40 feet and the unit consists chiefly of buff-colored, fine-grained sandstone. The underlying Fuson formation is about 100 feet thick and consists of gray to blue-gray mudstone with thin beds of very fine-grained, micaceous sandstone. The Lakota sandstone is approximately of the same thickness as the Fuson formation, and consists of an upper and a lower sandstone sub-unit separated by a gray to blue-gray mudstone that contains thin beds of siliceous sandstone. Locally, carbonaceous and peaty material is abundant in the mudstone. The basal unit of the Lakota sandstone is a coarse, thoroughly indurated, conglomeratic sandstone.

Mineralization

Most of the uranium ore produced in the Black Hills has come from the Lakota and Fall River sandstones, in about equal quantities.

In the Thorn Ridge area, all ore deposits and mineralized zones found to date are restricted to two sandstone sub-units in the Lakota sandstone.

The upper ore zone is in a fine- to medium-grained sandstone which ranges in thickness from 3 to 60 feet. Locally, this sandstone sub-unit contains abundant clay pebbles and is heavily iron-stained. Within the Shannon lease the sandstone ranges in thickness from 10 to 50 feet and the altitude of the contained ore varies from 4,180 to 4,215 feet. The lower ore zone is in a white to light-gray sandstone which has abundant clay pebbles in some places and is underlain by a silicified, conglomeratic sandstone. Areally, this sandstone sub-unit ranges in thickness from 30 to 110 feet, but within the Laymon property its thickness ranges from 30 to 65 feet. Altitude of the ore zone in this sandstone ranges from 4,100 to 4,120 feet. Mineralized rock in both sandstone sub-units is commonly friable, making core recovery difficult.

A background radioactivity of 40 to 50 counts per second was established when the A.E.C. drill holes were probed with gamma-ray logging equipment. All anomalous radioactivity in excess of 2,000 counts per second is restricted to the two ore zones of the Lakota sandstone described in the preceding paragraph, although anomalies greater than 300 counts per second are distributed throughout

the Lakota sandstone. Thickness of the upper ore zone ranges from 2 to 7 feet and the lower ore zone ranges in thickness from 2 to 8 feet. Any precise correlation between gamma-ray values and chemical or equivalent uranium percent is unknown. Gamma-ray values are useful chiefly for rough comparative purposes. A comparison of gamma-ray logs of the drill holes on the Laymon property and chemical analyses of samples taken from the same holes suggest that sediments containing 0.1 percent uranium will give a gamma-ray reading of about 5,000 counts per second, but the counts per second-percent uranium ratio is not constant.

Gamma-ray logs of drill holes within and near the Shannon lease indicate that there are three groups of holes that penetrate rocks having anomalous radioactivity in excess of 2,000 counts per second. Although the area included within a line enclosing each of these groups of holes is referred to as a zone in this report, it should be emphasized that this designation does not imply that the Lakota sandstone is continuously mineralized within the zone. A zone in the north-central part of the leased area trends northerly, a northeasterly-trending zone is in the west-central part of the area and a less well-defined zone in the southern part of the area trends southeasterly. There is a coincidence in trends of these zones with isoliths of sandstone in the Lakota sandstone. This relationship is

At the operator's request the contract was terminated on May 25, 1956 and a Certificate of Discovery was issued.

A summary of the data on both the A.E.C. holes and the DMEA holes is given in Table No. 1

Table No. 1—Summary of drill hole data

Hole No.	Non-Core	Core	Total	Percent Rec.
AEC 704	---	---	274	---
DMEA 7041	211	39	250	46
DMEA 7042	215	43	258	46
AEC 735	---	---	281	---
DMEA 7351	252	28	280	60
DMEA 7352	255	25	280	44
DMEA 7353	251	28	279	51
DMEA 7354	252	28	280	55
AEC 745	---	---	---	---
DMEA 7431	175	32	207	43
DMEA 7432	225	39	264	25
DMEA 7433	175	30	205	51
DMEA 7434	210	39.5	249.5	41
AEC 746	---	---	287	---
DMEA 7461	240	44	284	45
DMEA 7462	185	35	220	77
DMEA 7463	240	39	279	65
DMEA 7464	185	35	220	57
AEC 708	---	---	285	---
DMEA 7081	233	28	261	56
DMEA 7082	167	23	190	79
DMEA 7083	224	32	256	62
DMEA 7084	166	24	190	73
Totals			5579.5	
Total AEC	---	---	1127.0	
Total DMEA	3861	591.5	4452.5	
Disallowed	153	25.0	178.0	
Allowed DMEA	3708	566.5	4274.5	

ORE RESERVES

Ore-grade material was discovered on the Laymon property in A.E.C. holes 708, 735, 743, and 746 and in DMEA holes 7083, 7351, 7354, 7461, and 7463. Blocks of ore, as determined by the A.E.C. method of computing reserves, are shown on figure 3. In the summary of ore data shown below, value of the ore does not include the haulage allowance of 6 cents per ton mile.

Block	Tons of indicated and inferred ore	% U_3O_8	Lbs. U_3O_8	Value
A	6,174	0.22	27,165	$110,500
B	2,525	0.14	7,070	19,750
C	886	0.24	4,253	17,550
D	737	0.17	2,506	15,800
Total	10,322	0.20	40,994	$163,600
Initial production bonus at 0.20 percent U_3O_8				35,000
				$198,600

ORE CALCULATIONS

Indicated

Block and Hole Nos.	Area sq. ft.	Thickness ft.	Volume cu. ft.	Tons at 14 cu. ft/T	U_3O_8 Percent
746) 7461) A 7463)	7,500	6.00	45,000	3,214	0.22
708) 7083) B	5,000	3.40	17,000	1,215	0.14
7351) 7354) C	6,250	1.00	6,250	446	0.24
743) D	1,375	7.50	10,313	737	0.17
			Total	5,612	0.20

Inferred

Block and Hole Nos.	Area sq. ft.	Thickness ft.	Volume cu. ft.	Tons at 14 cu. ft/T	U_3O_8 Percent
A	6,900	6.00	41,400	2,960	0.22
B	5,400	3.40	18,330	1,310	0.14
C	6,150	1.00	6,150	440	0.24
D	--	--	--	--	--
			Total	4,710	0.20

Hole No.	Depth	Thickness	U_3O_8 Percent	Feet x percent
746	179 -180	1.0	0.02	0.02
	180 -181	1.0	0.06	0.06
	181 -182	1.0	0.23	0.23
	186 -187	1.0	0.39	0.39
	187 -187.7	0.7	0.03	0.03
	187.7-188.4	0.7	0.03	0.03
Totals		5.4	0.14	0.76
7461	185 -186	1.0	0.23	0.23
	186 -187	1.0	0.15	0.15
	187 -189	2.0	0.05	0.10
	189 -190	1.0	0.23	0.23
Totals		5.0	0.14	0.71
7463	184 -185	1.0	0.29	0.29
	185 -186	1.0	0.03	0.03
	186 -187	1.0	0.38	0.38
	187 -188	1.0	0.40	0.40
	188 -190	2.0	0.20	0.40
	190 -191	1.0	1.07	1.07
	191 -192	1.0	0.28	0.28
Totals		8.0	0.36	2.85
708	180 -183	3.0	0.11	0.33
7083	176 -177	1.0	0.29	0.29
	177 -178	1.0	0.28	0.28
	178 -179	1.0	0.06	0.06
	179 -180	1.0	0.09	0.09
Totals		4.0	0.18	0.72
7351	267 -268	1.0	0.18	0.18
7354	265 -266	1.0	0.30	0.30
743	188 -189	1.0	0.09	0.09
	189 -190	1.0	0.14	0.14
	190 -191	1.0	0.15	0.15
	192 -193	1.0	0.08	0.08
	193 -194	1.0	0.37	0.37
	194 -195	1.0	0.25	0.25
	195 -196.5	1.5	0.11	0.11
Totals		7.5	0.17	1.25

SUMMARY OF FACTUAL DATA

Diamond plug-bit drilling, 3,708 feet at $1.75 a foot = $6,489.00

Diamond core-bit drilling, 566.5 feet at $3.50 a foot = $1,982.75

Total amount of contract--	$59,360.00
Total cost of contract--	$11,461.51
Government participation at 75 percent-	$ 8,596.13

OPERATOR'S FINAL REPORT

The operator's final report was submitted on January 12, 1956. The narrative report and the exhibits are adequate, but the thickness and grade of the uranium ore discovered differ from our own calculations.

CONCLUSIONS AND RECOMMENDATIONS

The drilling program under Stage I of this contract resulted in a discovery of 10,322 tons of indicated and inferred ore with a weighted average grade of 0.20 percent U_3O_8. Although this ore cannot be mined at a profit, geologic interpretations of data derived from Stage I drilling supports the belief previously expressed by the examining team that this property may well contain a minable ore body.

Results of Stage I drilling under this contract are inconclusive with respect to the over-all exploration program as well as the delineation of ore deposits discovered by AEC drilling. The lateral extent of ore-grade mineralization has not been determined near any of the AEC ore holes; therefore, no justification can be found for precluding the possibility of a continuous ore body near these holes of sufficient size to warrant a mining program. Evaluation of data from the two favorable stratigraphic intervals is difficult because of poor core recovery, particularly in the lower interval. Poor core recovery probably indicates that sediments in the favorable intervals are friable and relatively unconsolidated.

Other ore bodies in the Black Hills area are commonly found in friable sandstones where local unconformities, irregular cementation, facies changes, or carbonaceous material have provided traps for the localization of ore deposition from mineralizing solutions. Slightly more than 24 percent of the 45 holes drilled on the Laymon property have contained ore-grade material in significant quantities. Mineralization has taken place in rocks that should have provided chemical and physical environments favorable for the production of large ore bodies. This is particularly true in the lower interval where friable, coarse, highly permeable pyritic sandstone overlies the relatively impermeable Morrison formation. Large quantities of

uranium-bearing solutions have obviously passed through the sediments of these two intervals and it is reasonable to suppose that the distribution of areas favorable for deposition of uranium from these solutions was controlled by sedimentary trends. Trends of this nature described in the report of examination have not been fully investigated.

In applying for a termination of the contract, the operator has signified that he does not concur with this interpretation of the results of Stage I drilling. It is the writer's opinion that additional exploration, as proposed in Stage II of the contract will result in the discovery of significant amounts of uranium ore.

indicated on figure 5. These zones not only trend with the sandstone isoliths but appear to follow relatively abrupt changes in the sandstone content of the Lakota sandstone.

The Homestake uranium mine, one of the largest producers in the Black Hills, is 2,500 feet southeast of the leased area. Uraniferous rocks at this mine are restricted to the upper Lakota sandstone. The ore body is roughly tabular, 3 to 7 feet thick, 280 feet long and 160 feet wide. The carnotite-type ore is found as interstitial fillings in the sandstone. According to unpublished A.E.C. reports, sedimentary features that may have controlled localization of ore at this mine include lensing of the upper Lakota sandstone, an impermeable mudstone underlying the ore sandstone, coarse sediments, and carbonaceous seams. The ore is associated with thin beds of siliceous and calcareous sandstone. Geologists of the A.E.C. suspect that the ore at the Homestake mine may trend northwestward toward the Shannon lease.

THE PROJECT

Stage I, of contract Idm-E870, provided for 18 holes comprising 3,600 feet of non-core and 940 feet of core drilling. The holes are 50-foot offsets of 5 AEC drill holes, as shown on figure 2. Stage I was completed on October 18, 1955, with all 18 holes drilled at the locations specified in the contract.

Square copy

700
Murphy

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

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

DEC 31 1956

Re: Field Team final reports
(Uranium contracts)

Dear Mr. Traver:

A review of the files on DMEA uranium contracts, where the work has been completed by the Operator or the work has been terminated for over six months, reveals that the final Field Team reports have not been received for the contracts listed below:

Contract No.	Docket number	Operator
Idm-E381	DMEA-2135	Sunnyside Uranium Company (Stage III)
Idm-E517	DMEA-2847	Sodak Uranium & Mining Company, Inc.
Idm-E631	DMEA-3032	Rare Earth Mining Company
Idm-E638	DMEA-3060	Thornburg Uranium Mines
Idm-E691	DMEA-3239	Urova Co.
Idm-E723	DMEA-3360	Mid-Continent Uranium Corp.
Idm-E796	DMEA-3582	J. Walter Duncan, Jr.
Idm-E823	DMEA-3614	Climax Uranium Co.
Idm-E860	DMEA-3613	Chatu Uranium Mining Company, Inc.
Idm-E870	DMEA-3762	Shannon Oil Co.
Idm-E877	DMEA-3767	Uranium Prospectors Co., Ltd.
Idm-E906	DMEA-3868	La Salle Mining Co.
Idm-E910	DMEA-3896	Hecla Mining Company
Idm-E928	DMEA-3962	Norbute Corporation

Kindly advise the status of the preparation of these reports and the date they may be expected in Washington. It is requested that these reports be given priority wherever possible in order that our dockets may be closed on these older projects.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

APPROVED:

P. F. Yopes
Member, Bureau of Mines

Thor H. Kiilsgaard
Member, Geological Survey

EHZ/gla 12-28-56
cc to: Admr.'s Reading File
Operating Committee
J. E. Crawford, 3643
T. H. Kiilsgaard, 5224 14 dockets
J. C. Horted, 3210, CFA
Code 700

9/14/56 gla

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

RECEIVED
SEP 13 1956

224 New Customhouse
Denver 2, Colorado

September 11, 1956

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium) Contract Idm-E870, Shannon Oil Company (Laymon Lease) Crook County, Wyoming - FINAL PAYMENT

Enclosed are two copies of a memorandum to T. A. Christensen, dated September 6, 1956, relative to final payment under the terms of the subject contract.

W. M. TRAVER

W. M. Traver

Enclosures

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

RECEIVED
SEP 13 1956

224 New Customhouse
Denver 2, Colorado

September 6, 1956

Memorandum

To: T. A. Christensen

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium) Contract Idm-E870, Shannon Oil Company (Laymon Lease) Crook County, Wyoming - FINAL PAYMENT

Reference is made to our memorandum of February 8, 1956 whereby we transmitted final form MF-104, Operator's Monthly Report and Voucher, for the period October 18, 1955 to November 25, 1955 and requested that you withhold an amount of $250.00 pending resolution of matters relative to closing the account.

The contract was terminated effective May 25, 1956. The Operator's Narrative Report for the above period has been accepted as the Operator's final engineering and geologic report. We now recommend that final payment to the Operator be made on the following basis, which is in conformance with the Report of Review by the Contract Administration and Audit Division, dated August 28, 1956, which was released to this office September 5, 1956.

Basis for Final Payment

Total accepted cost	$11,461.51
Government participation at 75 percent	8,596.13
Total prior payments	8,346.13
Balance due the Operator	$ 250.00

$250.00
9/7/56 DMA 51-30

W. M. TRAVER

W. M. Traver

JDC:jy
cc: Corresp. E870
MF-104 File E870
Sec. Op. Comm. (2)
Shaw (2)
Townsend
Chron.

Talbert

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

Mr. Thomas H. Brading
DMEA Auditor
224 New Customhouse Building
Denver 2, Colorado

Re: Report of Review
Idm-2870, DMEA-3762
Shannon Oil Co.

Dear Mr. Brading:

Receipt is acknowledged of your Report of Review covering the above-cited project.

The Report is acceptable and normal distribution may be effected.

Sincerely yours,

(Signed) E. D. Talbert

E. D. Talbert, Acting Chief
Contract Administration
and Audit Division

WBorovies/wb
August 30, 1956

Copy to: Docket
Admr. Reading File
Mr. Chambers

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

224 New Customhouse
Denver 2, Colorado

August 20, 1956

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium), Contract Idm-E870, Shannon Oil Company, Crook County, Wyoming.

Enclosed are the Government's, Division, and Docket copies of the "TERMINATION AGREEMENT" which were forwarded by your letter of August 9, 1956, for signature by the Operator and this office.

Copies of the Termination Agreement have been distributed to the Operator, the Finance Office, Region III, and others concerned.

W. M. Traver

W. M. Traver

Enclosures

RECEIVED
AUG 3 3 1956

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

224 New Customhouse
Denver 2, Colorado

August 14, 1956

Mr. Glen W. Pryor
Shannon Oil Company
603 Midland Savings Building
Denver 2, Colorado

Re: Docket DMEA-3762 (Uranium)
Contract Idm-E870, Shannon Oil
Company, Crook County, Wyoming

Dear Mr. Pryor:

Confirming advice to you by telephone today, enclosed are the Government's, Division, Docket, Operator's, Finance Office and Field Team copies of a proposed TERMINATION AGREEMENT which has been prepared to terminate Contract Idm-E870 effective May 25, 1956.

If the Termination Agreement is satisfactory, all copies are to be signed by an official of Shannon Oil Company authorized to sign such instruments for the Company, the signer's title inserted, and all copies promptly returned to this office.

Upon return to this office of the properly executed copies of the Termination Agreement and after dating and being signed by the Executive Officer, DMEA Field Team, Region III, for the Government, the "Operator's Copy" will be returned to you.

Very truly yours,

W. M. TRAVER

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

Enclosures

JWT/pw

cc: Chairman, Op.Comm. (2)
Harshman
Shaw (2)
Townsend
Corres. E870
Chron

RECEIVED
AUG 17 1956

name copy

700

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

Murphy
Ellis
Chambers
Martin
Johnson
Mattendorf

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

AUG - 9 1956

Re: Docket No. DMEA-3762 (Uranium)
Contract No. Idm-3870
Shannon Oil Company
Laymon Lease
Crook County, Wyoming

Dear Mr. Traver:

On June 12, 1956, the Administrator in a letter to the captioned Operator recommended that work under Stage II and possibly Stage III of the contract should be undertaken. Copies of this letter were forwarded to your office.

The Operator has not acknowledged the above letter; therefore, it is concluded that the Shannon Oil Company does not concur in the recommendation. Since the Government's percentage royalty on production from the subject lease is protected by the certification of discovery or development, issued May 25, 1956, it is suggested that the contract be terminated.

Enclosed are the original and five copies of such an agreement prepared for your and the Operator's signature. If you and the Operator find the Termination Agreement in order, kindly execute the original and all copies. Thereafter, distribute the copies in the usual manner.

Sincerely yours,

W. S. Martin

ACTING Chairman, Operating Committee (WSM)

Enclosures

FMMurphy/ai 8-6-56
cc to: Docket
Admr. Reading File
Operating Committee
Code 700
Mr. Murphy
Messrs. JECrawford, Rm. 3643
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA

APPROVED:

FRANK D. LAMB (DLB)
Member, Bureau of Mines

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

Not [illegible] Standard

[illegible]

[illegible]

[illegible]

[illegible]

Docket copy

Orbin Dunyon "Appl. Sol. Oil."

Murphy Ellis

NOTICE OF DEFAULT
UNDER
EXPLORATION PROJECT CONTRACT

To: Shannon Oil Company
603 Midland Savings Building
Denver 2, Colorado

Operating under Exploration
Project Contract Idm-2870
Docket No. DMEA-3762
dated September 14, 1955, as amended.

1. The United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, pursuant to the provisions of the article in the contract form entitled "Termination of the Government's Obligations," hereby notifies you that in its opinion you are in default under the terms of the contract in the following respect:

You have failed to perform work under Stage II of Exhibit "A" of the contract.

2. The Government hereby specifies September 1, 1956, as a reasonable time by which said default must be cured.

3. As provided in Article 11 of the contract, if said default is not cured within the time specified, thereupon:

(a) The Government shall be relieved of all obligations to contribute to costs not incurred when this notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to winding-up, reporting, and accounting; and

(b) The Operator shall be free of all obligations to prosecute the work other than such as may be necessary and incidental to winding-up, reporting, and accounting.

4. Said contract provides that the giving of this notice by the Government shall not affect the Government's rights as provided for in the contract with respect to a percentage royalty, and such rights are fully preserved.

Dated this _____ day of _____, 1956.

THE UNITED STATES OF AMERICA

By _____
Administrator, Defense Minerals
Exploration Administration

700

FILE COPY
Surname:

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

July 31, 1956

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Ernest Wm. Ellis, Chief
Rare and Miscellaneous Metals Division

Subject: Preparation of Termination Agreement
Docket No. DMEA-3762 (Uranium)
Contract No. Idm-E870
Shannon Oil Company
Laymon Lease
Crook County, Wyoming

Mr. Chambers and Mr. Johnson object to the Notice of Default prepared by the Legal Department in accordance with my memorandum of July 19, 1956.

Mr. Johnson suggests that we send the Operator a standard mutual termination agreement. If the Operator refuses to sign, we will then issue a unilateral termination. Therefore, will you kindly prepare a mutual termination agreement in accordance with the attached draft.

Ernest Wm. Ellis

FMMurphy/izm 7-31-56
cc to: Docket
Code 700
Mr. Murphy

DRAFT
FMMURPHY/iam
7-31-56

TERMINATION AGREEMENT

It is agreed this _____ day of _____, 1956 between the U.S.A. acting through the Department of the Interior, hereinafter called the "Government," and Shannon Oil Company, hereinafter called the "Operator," parties to that certain Exploration Project Contract Idm-E870, Docket No. DMEA-3762, dated September 14, 1955, as amended, hereinafter called the contract, that:

1. Effective May 25, 1956, the contract and all obligations of the parties thereunder, except as otherwise herein expressly provided, shall be and are hereby terminated;
2. The Government shall contribute to allowable costs incurred to said effective date;
3. Any work or operations prosecuted or costs incurred by the Operator beginning with said effective date, except as otherwise provided in this termination agreement, shall be for the sole account of the Operator without contribution by the Government;
4. All rights of the Government provided for in the contract with respect to a certification of discovery or development and a percentage royalty and lien for its payment are preserved; and
5. The Operator hereby releases and agrees to save the Government harmless from all claims or demands under or arising out of said contract, except as otherwise provided in this termination agreement.

IN WITNESS WHEREOF, these parties have executed this agreement as of the day and year first above written.

The United States of America

By: _____
Administrator

Shannon Oil Company
Operator

By: _____

_____

700

FILE COPY

Surname: Murphy

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

July 19, 1956

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Ernest Wm. Ellis, Chief
Rare and Miscellaneous Metals Division

Subject: Preparation of Termination Notice
Docket No. DMEA-3762 (Uranium)
Contract No. Idm-E870
Shannon Oil Company
Laymon Lease
Crook County, Wyoming

Will you kindly prepare a unilateral termination of Contract Idm-E870, Docket No. DMEA-3762 (Uranium) using the attached draft.

You will note the Administrator's letter of June 12, 1956, suggests that work under the contract should be resumed. We have had no response to this letter, therefore, it appears that termination of the contract is in order.

Ernest Wm. Ellis

Ernest Wm. Ellis

Attachment

FMMurphy/izm 7-19-56
cc to: Docket
Code 700
Mr. Murphy

Certified May 25/1956

700

FILE COPY
Surname: Murphy

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

JUN 12 1956

Mr. R. S. Shannon, Jr., General Partner
Shannon Oil Company
603 Midland Savings Building
Denver 2, Colorado

Re: Docket No. DMEA-3762 (Uranium)
Contract No. Idm-E870
Laymon Lease
Crook County, Wyoming

Dear Mr. Shannon:

We refer to your letter, dated April 16, 1956, addressed to Mr. W. H. Traver, Executive Officer, DMEA Field Team, Region III.

In this letter you state that of the 18 holes drilled (Stage I of the contract), significant mineralization was found in but 5 holes and that these findings, correlated with those of the AEC's, preclude any theory of an ore body with continuity or massiveness.

In our opinion results of the Stage I drilling are inconclusive with respect to the over-all exploration program agreed to under the contract. The lateral extent of ore-grade mineralization has not been determined near any of the AEC holes. Therefore, no justification can be found for precluding the possibility of a continuous ore body near these holes of a sufficient size to warrant a mining program. Moreover, we believe that data derived from Stage I drilling increases the geologic favorability of finding a minable ore body elsewhere on the land subordinated.

We note in the above-mentioned letter you request that your obligation to prosecute further work under the contract be terminated and the Goverment advise you that further operations are not justified. In view of the information on which we based our issuing a certificate of discovery or development on May 28, 1956, we believe that the work outlined for Stage II and possibly Stage III should be undertaken.

In accordance with Amendment No. 1 of the contract, work should have been resumed not later than May 1, 1956. However, if work under the contract is resumed, a new recess amendment can be prepared so that you will not be in default.

Sincerely yours,

G. O. Mittendorf

Administrator

DMEA Field Team, Reg. III (2)
Messrs. JECrawford, Rm. 3643
THKilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA
Admr.'s Reading File
Mr. Murphy
Docket
Code 700
6-12-56

cw

IN REPLY REFER TO:

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

June 7, 1956

Memorandum

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

From: T. H. Kiilsgaard, U. S. Geological Survey

Subject: Review of Field Team proposal to certify a discovery on the Shannon Oil Company project, DMEA Docket 3762.

Field examiners report that diamond drilling results of Stage I of the project are inconclusive with respect to the over-all targets of the exploration program, but that the results have increased the geologic favorability of finding a mineable ore body in the project area. They therefore recommend the project be continued as outlined in the contract. The Operator, however, is dissatisfied with exploration results and wishes to terminate the contract.

I concur with the field examiner's recommendations. The Operator should be asked to resume work on the project. If he refuses to comply the project should first be certified as a discovery and then the contract should be terminated by unilateral action because of his refusal to comply with contract terms.

T. H. Kiilsgaard

T. H. Kiilsgaard

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

FILE COPY
Surname:
Murphy
F. Thompson
Butler
Chambers
Payne
Crawford
Yopp
Kilsgaard
Martin
H. Johnson

Mr. R. S. Shannon, Jr., General Partner
Shannon Oil Company
603 Midland Savings Building
Denver 2, Colorado

MAY 2 1956

Re: Docket No. DMEA-3762 (Uranium)
Contract No. Idm-E870
Laymon Lease
Crook County, Wyoming

Dear Mr. Shannon:

Enclosed is a "Certification by the United States of America of a Discovery or Development Under an Exploration Project Contract." This certification covers all the land described in Article 2 of the subject contract.

By the terms of the Exploration Project Contract, as amended, and of the certification, all uranium and other valuable minerals produced from the claims described in Article 2 of the contract, from September 14, 1955, the date of the contract, are subject to the Government's percentage royalty as set forth in the contract until the sum which the Government has advanced as its participating interest is repaid, or until September 14, 1965, whichever occurs first.

Payments should be made to Mr. W. M. Traver, Executive Officer, DMEA Field Team, Region III, 224 New Customhouse Building, Denver 2, Colorado. Checks should be payable to the Defense Minerals Exploration Administration. The purchaser should be advised to deduct the royalties from the amount due on each shipment and forward the check directly to the Executive Officer. Any bonus payments or allowances received by you from the sale of ore are considered to be a part of the purchase price to which the Government's royalty applies. Royalty payments to the Government should be accompanied by suitable evidence, such as copies of settlement sheets, showing quantity and grade of the products sold, the name of the purchaser, and the price and charges, certified to be correct by the purchaser.

You are requested to notify Mr. Traver of any changes in ownership or production rights that might have any effect on the Government's right to its percentage royalty. Also, if production ceases at any time for an extended period, please notify Mr. Traver at six-month intervals that no production has been made, when that is the case.

Sincerely yours,

G. O. Mittendorf

Administrator

Enclosure
cc to: Frank E. and Anna M. Laymon, Sheridan, Wyoming

Docket
Rare and Misc. Metals Div.
Contract Adm. & Audit Div.
F. E. Johnson
Mr. Murphy

(5-18-56) 5-23-56
's Reading File
Operating Committee
Robert W. Geehan, Rm. 3608
T. H. Kiilsgaard, Rm. 5224
Field Team, Region III (2)

R.S.S.

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

790

Murphy
Johnson
Chernly
Paone
Crawford
Yager
Kilsgaard
Martin
Johnson

MAY 28 1956

Mr. Frank E. Laymon
Mrs. Anne M. Laymon
584 East 8th Street
Sheridan, Wyoming

Re: Docket No. DMEA-3762 (Uranium)
Contract No. Idm-E870
Shannon Oil Company
Laymon Lease
Crook County, Wyoming

Dear Mr. and Mrs. Laymon:

For your information, a certification of discovery or development has been issued to the Operator as a result of the exploration program under the above-referenced contract.

The property as set forth in the contract is the same property referred to in the Owner's Consent to Lien, dated August 23, 1955, which was signed by both of you.

We are enclosing the following for your records:

1. A copy of a "Certification by the United States of America of a Discovery or Development Under an Exploration Project Contract."

2. A copy of the transmittal letter to Mr. R. S. Shannon, Jr., General Partner, Shannon Oil Company, 603 Midland Savings Building, Denver 2, Colorado.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

FMMurphy/gla/izm 5-18-56
cc to: Docket
Admr.'s Reading File
Operating Committee
Field Team, Region III (2)
Contract Adm. & Audit Div.
Rare & Misc. Metals Div.
F. E. Johnson
Robert W. Geehan, Rm. 3608
T. H. Kiilsgaard, Rm. 5224
Mr. Murphy

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

RECEIVED
MAY 18 1956

May 17, 1956

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee

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

Subject: Report of Examination, DMEA Docket 3762,(Uranium), Contract Idm-E870, Shannon Oil Company (Laymon Lease), Crook County, Wyoming

I have reviewed the report of examination, DMEA Docket 3762, Contract Idm-E870, Shannon Oil Company, Crook County, Wyoming, dated May 8, 1956 and received in this office May 15, 1956. I have also discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

The applicant requested, on April 16, 1956, that the existing contract, Idm-E870, be terminated inasmuch as sporadic occurrence of uranium ore in apparently small pods makes economic recovery impractical.

The field examiners indicate that sufficient geologic data are available from the completed work to warrant an estimate of the size of deposits to be expected. They further state that it is probable that at least one ore body with dimensions of 200x120x4.5 feet underlies the subject area.

We recommend that the remaining work under Contract Idm-E870 be terminated and that the project be certified as a discovery.

The report is being forwarded to the Chief, Division of Minerals, in accordance with the routing slip attached thereto.

John E Crawford
John E. Crawford

DRAFT
5/16/56
FMMurphy/gla

To: Shannon Oil Company
603 Midland Savings Building
Denver 2, Colorado
Operator under Exploration Project
Contract Idm-E870, Docket No.
DMEA-3762 (Uranium), dated September 14, 1955

The United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, under the terms of the above-mentioned contract, hereby terminates the contract on the following grounds:

In the opinion of the Government, you have failed to prosecute operations pursuant to the terms of the contract by not continuing the exploration outlined for Stage II after Stage I was completed with satisfactory results.

Any work prosecuted or costs incurred by you after the receipt of this notice shall be for your own account.

All rights of the Government provided for in the contract with respect to a certification of discovery or development and a percentage royalty and lien for its payment are preserved.

Dated this _____ day of _____, 1956.

UNITED STATES OF AMERICA

By_____

To be held until certified letter is written to operator re start Stage II

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

RECEIVED
MAY 14 1956

224 New Customhouse
Denver 2, Colorado

May 11, 1956

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium), Contract Idm-E870, Shannon Oil Company (Laymon Lease), Crook County, Wyoming

Enclosed is the following material relative to termination of the subject contract:

1. Original and three copies of the Operator's letter of April 16, 1956, requesting termination of the contract as of the completion of the work under Stage I.

2. Original and three copies of a joint memorandum report, dated May 8, 1956, from W. D. McMillan, Mining Engineer, Bureau of Mines, and N. P. Cuppels, Geologist, Geological Survey, relative to terminating the contract and issuing a certification of discovery or development.

The original Amendment No. 1, prepared in your office, included a pseudo certification, which was objected to by the Operator, and upon recommendations from this office, by memorandum of December 27, 1955, the Amendment was revised to eliminate the pseudo certification provisions, because at that time we were not positive that a certification was justified.

On a more complete evaluation of the results of the work performed under Stage I, the field examiners now recommend that either additional drilling be performed under the contract or the project be certified as a discovery or development, based on the results of the drilling performed under Stage I.

We are positive that the Operator will not consent to performing additional work. Therefore, concurring with the recommenda-

tions of the field examiners, we recommend that the project be certified.

If the contract is to be terminated in its present status and the project certified as a discovery or development, the Operator's report covering work performed during the period from October 18 through November 25, 1955, received in this office January 12, 1956, is deemed adequate as a final report. Therefore the Government would have until July 12, 1956, to issue the certification.

W. M. Traver

W. M. Traver

Enclosures

SHANNON OIL CO.
(A LIMITED PARTNERSHIP)
603 MIDLAND SAVINGS BUILDING
DENVER 2, COLORADO

Apr. 16, 1956

DMEA
Ore Sold.
APR 17 1956
BUREAU OF MINES
Denver, Colorado
RECEIVED
MAY 14 1956

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

RE: DOCKET DMEA 3762 (URANIUM)
Contract Idm-E870
Shannon Oil Co.
Crook County, Wyoming

Dear Mr. Traver:

This will confirm our telephone conversation of April 13, 1956 in which we indicated that we contemplate performing no additional work under the subject Contract.

We completed Stage I of the Contract by drilling 50 ft. diagonal offset holes around AEC's five most favorable ore holes. Of the 18 holes drilled, we found significant mineralization in but five. These findings, correlated with those of AEC's, preclude any theory of an ore body with continuity or massiveness. Sporadic occurrence of ore in apparently small pods, volume and values encountered and depths at which encountered make economic recovery impractical at this time.

We, therefore, respectfully request that our obligation to prosecute further work be terminated and that the Government advise us that further operations are not justified.

Very truly yours,

SHANNON OIL CO.

By

GWP-v

IN REPLY REFER TO:

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

DMEA
Date Rec'd MAY 9 1956

BUREAU OF MINES
Denver, Colorado
RECEIVED
MAY 14 1956

May 8, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III
Through: E. N. Harshman
J. F. Shaw

From: W. D. McMillan
N. P. Cuppels

Subject: DMEA Docket 3762 (Uranium), Contract Idm-E 870, Shannon Oil Company (Laymon Lease), Crook County, Wyoming

Results of Stage I drilling under this contract are inconclusive with respect to the over-all exploration program as well as the delineation of ore deposits discovered by AEC drilling. The lateral extent of ore-grade mineralization has not been determined near any of the AEC ore holes; therefore, no justification can be found for precluding the possibility of a continuous ore body near these holes of sufficient size to warrant a mining program. Moreover, data derived from Stage I drilling increases the geologic favorability of finding a minable ore body elsewhere in the subordinated area.

Evaluation of data from the two favorable stratigraphic intervals is difficult because of poor core recovery, particularly in the lower interval. Poor core recovery probably indicates that sediments in the favorable intervals are friable and relatively unconsolidated.

Other ore bodies in the Black Hills area are commonly found in friable sandstones where local unconformities, irregular cementation, facies changes, or carbonaceous material have provided traps for localization of ore deposition from mineralizing solutions. Data from Stage I drilling tends to support the belief expressed in the report of examination that there has been widespread mineralization at two stratigraphic intervals in the Lakota sandstone. Slightly more than 24 percent of the 45 holes drilled on the Laymon property have contained ore-grade sediments in significant quantities. Mineralization has taken place in lithologies that should have provided chemical and physical environments favorable for the production of large ore bodies. This is particularly true in the lower interval where friable, coarse, highly permeable, pyritic sandstone overlies the relatively impermeable Morrison formation. Large quantities of uranium-bearing solutions have obviously passed through the sediments of these two intervals and it is reasonable to suppose that the distribution of areas favorable for deposition of uranium from these solutions was controlled by sedimentary trends. Trends of this nature described in the report of examination have not been investigated in the contract area.

Sufficient geologic data are available to warrant an estimate of the size of deposits to be expected. In view of the extensive mineralization of sediments having consistently favorable lithologic characteristics, it is probable that at least one ore body underlies this area with a horizontal cross-sectional area twice as large as

the minimum area of the deposit near AEC hole No. 746. If the predicted ore body should have a shape, in plan view, similar to the ore body mined-out at the Homestake mine 2,500 feet southeast of the Laymon property, and a thickness of the same order of magnitude (4.5 feet) as the deposit near AEC hole No. 746, it would have dimensions approximating 200 feet in length and 120 feet in width. The program of exploration as outlined under Stage II of this contract should detect deposits of this size in addition to evaluating trends of the mineralization.

In view of the above considerations, the following recommendations are submitted:

1. Exploration of this property should proceed as outlined under Stage II of Exhibit A of the contract.
2. If the above recommendation is rejected, a certification of discovery should be executed for this property.
3. Holes drilled under Stage I should be probed by the U. S. Geological Survey logging unit which is temporarily assigned to the Black Hills area under the direction of Carl Bunker of Grand Junction.

W. D. McMillan, Mining Engineer

N. P. Cuppels, Geologist

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

224 New Customhouse
Denver 2, Colorado

February 13, 1956

Mr. Glen W. Pryor
Shannon Oil Company
603 Midland Savings Building
Denver 2, Colorado

Re: Docket DMEA-3762 (Uranium)
Contract Idm-E870
Crook County, Wyoming

Dear Mr. Pryor:

We have processed through this office your Monthly Report and Voucher for work performed under Contract Idm-E870 during the period October 18 - November 25, 1955. The following disallowances have been made.

1) An amount of $87.50 for 25 feet of core drilling at $3.50 per foot. Hole 7351: 13 feet, Hole 7353: 12 feet.

2) An amount of $267.75 for 153 feet of non-core drilling at $1.75 per foot. Hole 7351: 67 ft., Hole 7352: 5 ft., Hole 7353: 74 ft., Hole 7354: 7 ft.

3) An amount of $101.46, the incidental allowance for the above 178 feet at $0.57 per foot.

4) An amount of $17.70 for radiometric logging of 177 feet of the above drilling at $0.10 per foot.

5) An amount of $5.00, the cost of the chemical analysis of sample No. 5406-9, Hole 7351, interval: 268-273 feet.

TOTAL AMOUNT DISALLOWED: $479.41

All of the above disallowances were related to drilling below the ore horizons stipulated in the contract. The four holes offsetting A.E.C. Hole 735 exceeded contract allowance.

In addition to the above disallowances, an amount of $250.00 was withheld pending resumption of work under the contract, or if work is not resumed, the amount shall continue to be held pending resolution of matters relative to closing the account which includes the rendering of a Final Operator's Report as stipulated in Article 7 (c) of the contract, and the release of a Final Audit or Report of Review of contract expenditures by the Contract Administration and Audit Division, DMEA. In this instance, if no further work is approved, it is probable that your Monthly Progress Report for October - November, 1955 will be acceptable as the Final Operator's Report.

We request that you submit your request or recommendations regarding Stage II drilling as soon as possible. The contract completion date is September 1, 1956.

Reconciliation with Amount Claimed on Form MF-104

Amount claimed	$11,940.92
Amount disallowed	479.41
Allowable costs for October-November, 1955	$11,461.51
Government Participation at 75 percent	$ 8,596.13
Amount withheld	250.00
Recommended payment to Operator	$ 8,346.13

If there is any question regarding the above amounts, please feel free to contact this office.

Very truly yours,

W. M. TRAVER

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

JDC:jy
cc: Corresp. E870
Sec. Op. Comm. (2)
Harshman
Shaw (2)
Townsend
Chron.

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

RECEIVED
FEB 13 1956

224 New Customhouse
Denver 2, Colorado

February 9, 1956

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium), Contract Idm-E870, Shannon Oil Company, Laymon Lease, Crook County, Wyoming

Enclosed are the Government's, Division, and Docket copies of Amendment No. 1 to Contract Idm-E870, which was prepared in Washington and forwarded by your letter of January 31, 1956, for signature by the Operator and the Executive Officer, DMEA Field Team, Region III.

Copies of the Amendment have been given to the Operator, the Finance Office, Region III, and distributed to other offices concerned.

W. M. Traver

W. M. Traver

Enclosures

700

FILE COPY
Surname:

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

JAN 31 1956

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

Re: Docket No. DMEA-3762 (Uranium)
Contract No. Idm-8870
Shannon Oil Company
Laymon Lease
Crook County, Wyoming

Dear Mr. Traver:

On December 16, 1955, a proposed Amendment No. 1 to the subject contract was forwarded to your office for execution. In a memorandum dated December 27, J. W. Townsend, Acting Executive Officer, returned the original and seven copies of the proposed amendment and copies of a letter, dated December 22, 1955, in which the Operator objected to paragraph 2(d) of the proposed amendment.

Enclosed are the original and seven copies (two extra copies of the amendment for the Field Team's file) of a redrafted Amendment No. 1 in which the paragraph objected to by the Operator has been eliminated. If you and the Operator find the proposed amendment in order, kindly execute the document. Thereafter, distribute the copies in the usual manner.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee

Enclosures

FMMurphy/izm 1-18-56
cc to: Docket
Code 700
Admr.'s Reading File
Operating Committee
Mr. Murphy
Messrs. JECrawford, Rm. 3641
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA

APPROVED:

/s/ Robert W. Geehan
Member, Bureau of Mines

Thor H. Kiilsgaard
Member, Geological Survey

Pocket copy

AMENDMENT NO. 1
to
EXPLORATION PROJECT CONTRACT IAm-2870
dated September 14, 1955
DOCKET NO. IAMA-3768
between
THE UNITED STATES OF AMERICA
and
SHAMROCK OIL CO.

It is agreed this _____ day of _____, 195__, that the "Contract" is amended as follows:

1. (a) Work under the Contract shall be suspended during the period beginning November 26, 1955, and ending not later than May 1, 1956.

(b) No costs incurred by the Operator during the period of suspension shall be allowable for contribution by the Government, and the Government shall not contribute to any costs of rehabilitation or repair which, in its opinion, would not have occurred if there had been no suspension of the work.

(c) The Operator at his own cost and expense, without contribution by the Government, during the period of suspension shall preserve and protect the project work and any property in which the Government has an interest.

2. It is of the essence of this Contract that the work be resumed before the termination of the period here fixed for suspension; and if it is not so resumed in the manner required by the Contract, the following provisions shall thereupon become effective:

(a) Effective November 26, 1955, the Contract and all obligations of the parties thereunder, except as otherwise herein expressly provided, shall be and are hereby terminated.

(b) The Government shall contribute to allowable costs incurred prior to said effective date.

(c) The Operator shall promptly perform all winding-up and settlement actions provided for in the Contract, including the rendering of the final report and final account.

(d) All rights of the Government provided for in the contract with respect to a certification of discovery or development and a percentage royalty and lien for its payment are preserved.

(e) The Operator hereby releases and agrees to save the Government harmless from all claims or demands under or arising out of said contract, except as otherwise provided in this termination agreement.

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may be required to contribute, nor the amount of any item designated as maximum.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By _____
Administrator, Defense Minerals
Exploration Administration

Robin
Denyer
"Appd. Sol. Off."
Murphy
Ellis
Talbert

SHANNON OIL CO.

By _____
(General) Partner

(d) The Operator, as principal if the Operator is the producer, or as surety if the Operator is not the producer, shall pay to the Government the royalty on production provided for in the contract, in the same manner and amount, and for the same period, as if certification of discovery or development had been made, such certification being hereby waived.

(e) The Operator hereby releases and agrees to save the Government harmless from all claims or demands under or arising out of said Contract, except as otherwise provided in this termination agreement.

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may be required to contribute, nor the amount of any item designated as maximum.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By C. W. McMeadows
Administrator, Defense
Minerals Exploration
Administration

Contr.
Design
Appr. Sol. Off.
Murphy
Ellis
Fisher
Chambers
Selfridge
Johnson

SHANNON OIL CO.

By _____
(General Partner)

Memorandum to File

F.M. Murphy, Jan. 30, 1956

Amendment No. 1.

Docket No. DMEA-3962 (Uranium)

Contract No. Idm. 5870

Shannon Oil Company

Layman Lease

Crook County, Wyoming.

A proposed amendment No. 1. for a recess period carried a pseudo-certification clause. The Operator objected to this clause in a letter dated December 22, 1955, addressed to the Executive Officer, and returned the amendment unsigned.

Information available here indicates that if any work has been done under the contract it probably consisted of bulldozing access roads. Therefore, a pseudo-certification was not warranted. The present proposed amendment is a simple recess authorization.

Operator advised that Mr. F. M. Murphy, A.E.C. has instructed us to omit pseudo-certification clause in recess amendments.

Surname copy

700
Murphy
Ellis

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

January 16, 1956

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: F. M. Murphy, Mining Engineer
Rare and Miscellaneous Metals Division

Subject: Docket No. DMEA-3762 (Uranium)
Contract No. Idm-2870
Shannon Oil Company
Laymon Lease
Crook County, Wyoming

Returned herewith are the original and seven copies of a suspension-termination agreement relating to the captioned contract.

Will you kindly prepare a recess agreement according to the attached draft in lieu of this Amendment No. 1.

Only part of Stage I drilling has been completed under the contract. Therefore, we are not able to judge at this time, whether or not we wish to terminate the contract. The contract was approved because we expected favorable results; hence, it is not to the Government's interest to terminate the contract if the Operator does not resume work after the recess period. In this case, we could not demand the moneys which the Government has contributed. This we can do under the contract if the Operator is in default.

/s/ F. M. Murphy

F. M. Murphy

FMMurphy/gla
cc to: Docket
Code 700
Mr. Murphy

P. S. Please prepare the amendment for the signature of the Executive Officer.

DRAFT
FMturphy/gla
1/16/56

SUSPENSION AGREEMENT

It is agreed this _____ day of _____, 1956, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and Shannon Oil Co., hereinafter called the "Operator," parties to that certain Exploration Project Contract Idm-E870, Docket No. DMEA-3762, dated September 14, 1955, hereinafter called the "Contract," that:

1. (a) Work under the Contract shall be suspended during the period beginning November 26, 1955, and ending not later than May 1, 1956.

(b) No costs incurred by the Operator during the period of suspension shall be allowable for contribution by the Government, and the Government shall not contribute to any costs of rehabilitation or repair which, in its opinion, would not have occurred if there had been no suspension of the work.

(c) The Operator at his own cost and expense, without contribution by the Government, during the period of suspension shall preserve and protect the project work and any property in which the Government has an interest.

2. This agreement shall not be construed to increase the estimated total cost of the project nor the aggregate total amount which the Government may be required to contribute under the provisions of the Contract.

IN WITNESS WHEREOF, these parties have executed this agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA

_____
Operator

By _____
Executive Officer,
DMEA Field Team, Region III

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

RECEIVED
DEC 29 1955

224 New Customhouse
Denver 2, Colorado

December 27, 1955

Memorandum

To: Chairman, Operating Committee, DMEA

From: Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium) Contract Idm-E870
Shannon Oil Company, Laymon Lease, Crook County, Wyoming

Enclosed are the original and five copies of Amendment No. 1 to Contract Idm-E870 which was forwarded by your letter of December 16, 1955, for signature by the Operator. Also enclosed are the original and two copies of the Operator's letter of December 22, 1955, returning the amendment to this office unexecuted.

The Operator protests inclusion of the pseudo certification in the amendment. We see no particular reason to execute a pseudo certification at this time, and recommend that it be deleted from the amendment.

J. W. Townsend

J. W. Townsend

Encls.

GWP
Townsend

SHANNON OIL CO.
(A LIMITED PARTNERSHIP)
603 MIDLAND SAVINGS BUILDING
DENVER 2, COLORADO

Dec. 22, 1955

RECEIVED
DEC 29 1955
DMEA
Date Rec'd.
DEC 23 1955
BUREAU OF MINES
Denver, Colorado

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

SUB.: DOCKET DMEA 3762 (URANIUM)
Contract IDM-E870

Dear Mr. Harshman:

Enclosed find original and four copies of Amendment No. 1 to subject Contract.

We are not in agreement with the provisions of Paragraph 2.(d) relative to an arbitrary certification of discovery or development and feel that waiving a certification, based on a full report of findings and inspection, would serve neither the best interests of the Government nor ourselves. We therefore ask that this paragraph be deleted or amended to conform with the broad provisions of ARTICLE 8 of the Contract.

All other items of the proposed Amendment are satisfactory to us.

Very truly yours,

SHANNON OIL CO.

By

GWP-v

Encl.

Surname copy

700

Murphy
Ellis
Selfridge
Fellman

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

DEC 16 1955

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Region III
7th New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-3768 (Uranium)
Contract No. Idm-8870
Shannon Oil Company
Lagunon Lease
Crook County, Wyoming

Dear Mr. Lagunon:

In accordance with your request of December 2, 1955, we are enclosing the original and five copies of a proposed Amendment No. 1 to the subject contract. Also, enclosed are two extra copies of the amendment for attachment to your extra copies of Exhibit "A".

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Enclosures

APPROVED:

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

Thor H. Kiilsgaard (GCS)
Member, Geological Survey

FMMurphy/GCSeldridge/gla
(12-14-55)
12-15-55
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. JECrawford, Rm. 3641
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA
Code 700
Mr. Murphy

RCS

Surname copy

700

Murphy
Ellis
Fisher
Chambers

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

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

Re: Docket No. DMEA-3762 (Uranium)
Contract No. Idm-2870
Shannon Oil Company
Layman Lease
Crook County, Wyoming

Dear Mr. Traver:

Enclosed are the original and five copies of a proposed Amendment No. 1 to the subject contract. Also, enclosed are two extra copies of the amendment for attachment to your extra copies of Exhibit "A".

In regard to the Field Team's authority with respect to suspension of work under a contract, please refer to DMEA Circular 33, June 30, 1954, page 2, Article 1, under the caption "Suspension." The above amendment has been prepared here; however, in this case, the amendment could have been executed by the Field Team if it had so desired.

Sincerely yours,

Chairman, Operating Committee

Enclosures

APPROVED:

Member, Bureau of Mines

Member, Geological Survey

FMMurphy/gla
11-14-55
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. JECrawford, Rm. 3641
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA
Code 700
Mr. Murphy

December 6, 1955

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: F. M. Murphy, Mining Engineer
Rare and Miscellaneous Metals Division

Subject: Agreement to recess project
Docket No. DMEA-3762 (Uranium)
Contract No. Idn-E870
Shannon Oil Company
Layman Lease
Crook County, Wyoming

Will you kindly prepare an agreement authorizing the Shannon Oil Company to recess work on the captioned project from November 26, 1955, to May 1, 1956.

It is believed that the contract will be completed on or before September 1, 1956, the date the work should be terminated under the contract; therefore, this date need not be changed.

/s/ F. M. Murphy

F. M. Murphy

FMMurphy/gla
cc to: Docket
Code 700
Mr. Murphy

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

RECEIVED
DEC - 5 1955

224 New Customhouse
Denver 2, Colorado

December 2, 1955

Memorandum

To: Chairman, Operating Committee, DMEA

From: Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium), Contract Idm-E870, Shannon Oil Company, Layman Lease, Crook County, Wyoming.

Enclosed are the original and two copies of a letter from Glen W. Pryor, Shannon Oil Company, dated November 30, 1955, wherein it is requested that work under the subject contract be recessed from November 26, 1955, to May 1, 1956.

The recess of operations will not involve an extension of the completion period at this time. Therefore we recommend that an amendment be prepared to authorize a recess as requested.

E. N. Harshman

E. N. Harshman

Enclosures

SHANNON OIL CO.
(A LIMITED PARTNERSHIP)
603 MIDLAND SAVINGS BUILDING
DENVER 2, COLORADO

RECEIVED
DEC - 5 1955

Nov. 30, 1955

DMEA
Date Rec'd.
DEC 1 1955
BUREAU OF MINES
Denver, Colorado

Mr. W. M. Traver
Executive Officer, DMEA
Field Team, Region III
U.S. Department of the Interior
224 New Customhouse
Denver 2, Colorado

RE: DMEA 3762 (URANIUM)
CONTRACT IDM-E870
Shannon Oil Co. (Laymon Lease)
Crook County, Wyoming

Dear Mr. Traver:

Stage I of the above contract was started October 18, 1955 and was completed November 26, 1955.

We respectfully request that the Project be recessed and that no work be accomplished under Stage II or Stage III until on or after May 1, 1956.

Your compliance with this request will permit us to recess during the extreme weather conditions now being experienced and will allow us to completely evaluate the results of our Stage I exploration.

Very truly yours,

SHANNON OIL CO.

By Glen W. Pryor

GWP-v

2-16-56

RECEIVED

FEB 15 1956

FINAL DISTRIBUTION

MADE FEB 13 1956

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
REGION III

Administrative Audit Difference Statement

Date: [illegible]
Payee's
Reference: [illegible]

DMEA-3762

[illegible]
[illegible]
Denver 2, Colorado

Gentlemen:

Upon examination of the above Payee's Reference a difference was found which made it necessary to suspend your account accordingly:

Amount Claimed	$ [illegible]
Difference	$ [illegible]
Amount Approved	$ [illegible]

Explanation: (1) The reason for the difference was due to:
[illegible] ft. of core drilling @ [illegible] per ft. [illegible]
The contract stipulates that only two of the four holes allotted holes 73) shall be drilled before the upper cross-bearing vein is intersected. All four holes were drilled through the lower cross bearing vein. The cores were drilling in holes 73-1 & 73-2 so shall not.
(2) [illegible] ft. non-core drilling @ [illegible] per ft. [illegible]
[illegible] ft. were drilled below the upper cross-bearing vein in holes 73-1 & 73-2. [illegible] ft. were drilled below the lower cross bearing vein in holes 73-1 & 73-2, due to violation of contract term.
(3) The material allowance for the above total of [illegible] ft @ [illegible] [illegible]
(4) The reinforced header allowance for [illegible] @ [illegible] per ft [illegible]
[illegible] ft. of the above drilling are not found.
(5) The cost of 1 chisel collarin, [illegible] holes 73-1 [illegible]
Total deducted [illegible]

Attention:
[illegible] penalty reception of work under the contract or pending resolution of matters relative to closing the account, as with order No. [illegible] of the contract has been completed.

Any reclaim for deductions made above must be supported by the ORIGINAL of this form.

Very sincerely yours,

N. E. Stokes
Audit Section

Operator's [illegible]
Oct 18 - Nov. 25.
See memorandum
folder # 2

R-III-B & F Form No. 4
4-15-52 D

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

RECEIVED
FEB 15 1956

224 New Customhouse
Denver 2, Colorado

ADMINISTRATIVE OFFICE REGION III
FEB - 9 1956
BUREAU OF MINES
DENVER, COLORADO

February 8, 1956

Memorandum

To: T. A. Christensen

From: Executive Officer, DMEA Field Team, Region III

Subject: DMEA Docket 3767 (Uranium) Contract Idm-E870, Shannon Oil Company, Layman Property, Crook County, Wyoming. Operator's Monthly Progress Report for the period October 18 - November 25, 1955

Enclosed are the original and four copies each of Forms MF-104 and MF-104A, Narrative Report, and Engineer's Report for the above period.

It is deemed that the Operator has complied with the intent of the contract, and the work for which payment is recommended is acceptable to the Government. Payment is recommended for 75 percent of the amount as reported on Form MF-104, contingent on your verification of the correctness of applicable rates and arithmetical accuracy of computations, except for the following deductions.

Disallow 1) an amount of $87.50, the cost of 25 feet of core drilling at $3.50 per foot. The contract stipulates that only two of the four holes offsetting Hole 735 shall be drilled below the upper ore-bearing unit of the Lakota formation. Contrary to this stipulation all four of the offset holes were drilled through the lower ore bearing unit. The excess core drilling in Holes 735-1 and 735-3 is disallowed.

2) an amount of $267.75, the cost of 153 feet of non-core drilling at $1.75 per foot. 141 feet was drilled below the upper ore-bearing unit in Holes 735-1 and 735-3. 12 feet was drilled below the lower ore bearing unit in Holes 735-2 and 735-4, also in violation to the contract terms.

See Operator's

Due to the unfavorable results, the applicant is not proposing any further exploration.

It is recommended that $250.00 be withheld from the approved amount pending resumption of work, or termination of the contract.

Scott W. Hopkins
for W. D. McMillan
Mining Engineer

WDM/mw
cc 6
Idm-2870
Chron.

RECEIVED
FEB 15 1956

REGION III

Building 20
Denver Federal Center
Denver 2, Colorado
February 6, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

Through: John F. Shaw *Sw H for*
Supervising Mining Engineer

From: W. D. McMillan

Subject: DMEA 3762, Contract Idm-8870 (Uranium) Shannon Oil Company, Layman Property, E½ N.W. ¼ and W½ N.E. ¼, Section 27, T. 52 N., R. 66 W., 6th principal meridian, Crook County, Wyoming. Final Report - October 18 - November 25, 1955.

Progress was checked on December 6, 1955 in company with Glen W. Pryor, Field Superintendent of Shannon Oil Company, who guided the examining engineer to all the holes and furnished drill hole data on the 18 drill holes of Stage I of the contract. All holes were drilled at the contract specified locations of 50 feet on diagonals from AEC drill holes with the exception of Hole 743-1 which was 46 feet from the original location to avoid a clump of trees. Summary logs of the holes drilled are given below:

Hole	Core Recovery - %	Plug-bit Footage	Core bit Footage	Total Footage	Uranium Content % U_3O_8
704-1	37	211.0	39.0	250	Slight
704-2	46	215.0	43.0	258	"
735-1	60	245	28.0	273	× 0.18 267' - 268'
2	46	250	25.0	275	0.09 260' - 261'
3	52	244	28.0	272	Slight
4	55	245	28.0	273	× 0.30 265' - 266'
743-1	43	175	32.0	207	Slight
2	51	225	39.0	264	"
3	52	175	30.0	205	"
4	41	210	39.5	249.5	"
746-1	45	240	44.0	284	× 0.23 182.5' - 183' 0.18 187.5' - 188'
2	79	175	45.0	220	Slight
3	53	230	49.0	279	× 0.50 187.5' - 188' 0.35 190.0' - 191.5'
4	54	175	45.0	220	Slight
708-1	56	233	28.0	261	"
2	79	167	23.0	190	× 0.20 178' - 179'
3	62	224	32.0	256	Slight
4	73	166	24.0	190	"
18		3505	621.5	4126.5	

Claimed by Applicant

3861	591.5	4452.5
1.75	3.50	
6756.75	2070.25	8832.00

The applicant exceeded the contract footage of non-core drilling by 261 feet, but the footage of core drilling was 348.5 feet less than the contract footage.

In Exhibit "A" of Contract Idm-2870 the estimated depth through the upper unit of the Lakota sandstone was 205 feet and to the bottom of basal unit of the Lakota sandstone was 270 feet, and two holes in each group were to be drilled through the upper unit of the Lakota sandstone and two holes through both the upper and basal units. The estimated depth through the basal unit of 270 feet was exceeded in a few cases as this was determined by the top of the Morrison formation.

The contract specifications were observed for all the holes except the 735 group, where the four holes were drilled through both units, requiring disallowal of the footage below the upper unit of the following two holes:

Hole No.	Core-bit and Plug-bit Drilling Unit	From	to	Feet	Remarks
735-1	Upper	185	200	15	Allowed
	Intermediate	200	260	60	Dis-allowed
	Basal	260	273	13	Dis-allowed
735-3	Upper	177	193	16	Allowed
	Intermediate	193	260	67	Disallowed
	Basal	260	272	12	Disallowed

Disallowances as follows are recommended:

Plug Bit Drilling	- 127 feet at $1.75/ft.	$222.25
Core Bit Drilling	- 25 feet at $3.50/ft.	87.50
Incidental	- 152 units at $0.57/ft.	86.64
	Total	396.39

Contract cost for 3805 - 127 or 3678 feet of plug-bit drilling at $1.75 a foot is $6436.50 and for 621.5 - 25 or 596.5 feet of core-bit drilling at $3.50 a foot is $2087.75. Radiometric logging of 3960 feet at $0.10 is $396.00, 36 chemical analyses at $5.00 each is $180.00, and incidental allowance of 4274.5 feet at $0.57 a foot is 4426.5 - 152.0 or $2436.46, a total of $11,536.71.

Payment of 75 percent of the total costs calculated from the drill logs less dis-allowances, or $8652.53, is approved.

Driller's logs were not submitted, but copies of radiometric and geologic logs are enclosed.

Form MF-104 (Rev.)
(April 1952)

DMEA
Date Rec'd.
JAN 6 1956
BUREAU OF MINES

Budget Bureau No. 42-R1036.5

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of Oct. 18 - Nov. 25 195 5 Docket No. DMEA 3762 Contract No. Idr. E-870
Operator's Name Shannon Oil Co. Minerals Uranium
Address 603 Midland Savings Building, Denver 2, Colo.
Contract Amount, $ 11,940.92 Government Participation: 75 % Amount, $ 8,955.69

RECEIVED
FEB 15 1956

ITEMS OF COSTS	FOR OPERATOR'S USE: Monthly Total	Totals Previously Reported	Totals To Date	FOR GOVERNMENT USE ONLY: Approved Monthly Total	Approved Totals Previously Reported	Approved Totals To Date
(1) Independent Contracts:						
Drilling 3861 Ft.	6756.75	None	6756.75			
Bulldozing						
Crosscutting						
Drifting						
Core Drilling 591½ Ft.	2070.25	None	2070.25			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
(4) Operating Equipment: Radiometric Logging						
Rental 3960 Ft.	396.00	None	396.00			
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
* Sampling and Analysis 36	180.00	None	180.00			
Payroll Taxes						
Liability Insurance						
* Incidental Allowances 4452½ Ft.	2537.92	None	2537.92			
(8) Contingencies (specify):						
		* FIXED UNIT COSTS				
TOTALS	11,940.92		11,940.92	11,461.51	—	11,461.51

I certify that the above bill is correct and just and that payment therefor has not been received.
Date JAN 6 1956 *Payee Shannon Oil Co.
Per Glen G. Pryor Title Field Supt.

*When a voucher is signed or receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary," or "Treasurer," as the case may be.

NOTE.—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.

(Instructions on reverse)

Pursuant to authority vested in me, I certify that this account is correct and proper for payment in the amount of:
$ 8346.13
Signature
(Authorized Certifying Officer)
Date 2/10/56 Vou. No. DMA 56-69
(See other side)

Note: 250.00 withheld

(For Government use only)

CERTIFICATION BY GOVERNMENT REPRESENTATIVE:

I certify that to the best of my knowledge and belief the contractor submitting this voucher is operating a Defense Minerals Exploration Administration project under Contract No. Tdm-E870 in accordance with the terms of the contract.

Signature William D. McMillan Title Min. Engr. Date 1/10/56

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature W. M. Davy Title Executive Officer Date FEB 8 1956

MONTHLY REPORT OF OPERATOR

The Operator (Contractor) of an exploration project is required to make a monthly report to the Government through the Regional Executive Officer. This report consists of three parts as follows:

(a) *Form MF-104—Operator's Monthly Report and Voucher.*—This form details expenditures and constitutes a voucher for reimbursing the Operator for the Government's share of costs;

(b) *Form MF-104A—Operator's Unit Cost and Progress Report.*—This is a statistical report of expenditures which shows costs for the various types of operation; and

(c) *Narrative.*—A concise narrative description of progress made, results accomplished, and any unusual difficulties encountered must be furnished as an attachment to this Report and Voucher. Wherever possible, the narrative is to be illustrated with maps or sketches showing formations penetrated and location and assays of samples taken as well as advances in workings. In the case of diamond drilling or churn drilling, the location and inclination of holes is to be shown on a map; logs and assays also are to be submitted.

The Monthly Report of Operator should be prepared in an original and four copies all of which must be sent to the Executive Officer of the Region not later than the 15th of the month following.

Preparation of Form MF-104—Operator's Monthly Report and Voucher.—All the applicable spaces in Form MF-104 should be filled in by the Operator, and the Operator or his agent should sign the certification in the lower left corner of the form.

The items of costs are arranged in the order they appear in Article 6 (a) of Form MF-200 (Revised February 1952), however, this form is readily adaptable for use in reporting activities under other contract forms.

Under Item (1) delete words "Short Form" if the contract is a sub-contract under Form MF-200; and delete word "Independent" if the contract reported is on Form MF-200 (A). Also, report work paid for on a unit basis under contract Form MF-200 as though it were performed under an independent contract.

Under Item (2) include labor, supervision and technical services incurred for the exploratory operations. Do not include labor, supervision and technical services used for work performed under items (5) and (6).

Under Item (3) include the costs of material and supplies used in the project other than that used under items (5) and (6).

Under Item (4) appear the three types of operating equipment expenditures, that is, rental, purchase and depreciation. The expenditures made for renting equipment belonging to a third party will be reported under "Rental". The amount paid or duly obligated for payment for the purchase of equipment will be reported under "Purchase". The amount of expenditures due the Operator to reimburse him for depreciation of equipment owned will be reported under "Depreciation".

Item (5) comprises costs of labor, supervision, technical services, materials, etc., which are used in the initial rehabilitation and repair of existing buildings, installations, fixtures, and equipment. These costs, therefore, should not be reported under items (2) and (3).

Item (6) includes the labor, supervision, technical services, materials, etc., used in the installation or construction of new buildings, fixed improvements, etc., necessary for the project. These costs, therefore, should not be reported under items (2) and (3).

Item (7) covers miscellaneous types of expenditure such as payroll taxes, liability insurance, workmen's compensation insurance, repairs to equipment and sampling and analysis. Only that part of payroll taxes, liability insurance and workmen's compensation which are paid by the operator should be reported under item (7). The share paid by the employee as a payroll deduction is to be included under item (2) as labor costs.

Item (8) includes any unforeseen costs not included in the other seven categories.

The original of Form MF-104 when submitted for reimbursable expenses incurred under contract Form MF-200 must be supported by original documentation or by certified copies of purchase orders, payrolls or transcripts of payrolls, unless such documentation has been waived by the Regional Executive Officer. This certification may be stated thus, "Certified True Copy (or Transcript)", followed by appropriate signature. If the Executive Officer of the Region determines that a contract under Form MF-200 should have an "on-site" audit, that is, a Government auditor should make an audit of the Operator's books and records of account, the Operator need not support his monthly voucher with original or certified documents except in cases of equipment purchases whose individual costs exceed $50.00. In these cases the original or a certified copy of the purchase order or invoice should be attached to the Monthly Voucher. N. B.—Only the *original* of Form MF-104 is required to be documented. The four copies of Form MF-104 are not to be thus supported.

Form MF-104 submitted for reimbursement under fixed price contracts on Form MF-200 (A), however, are not required to be supported by documentation of any kind. The Operator will submit his claim under item (1) of Form MF-104 by deleting as stated above the word "Independent" and by showing the number of feet or other units immediately after the appropriate descriptive word, such as, drilling, bulldozing, crosscutting, drifting, etc., and giving the "Monthly Total" amount due. "Totals Previously Reported", and "Totals to Date" columns should also be filled in.

Form MF-104A
(April 1952)

Budget Bureau No. 42-R1151.2

DMEA
Date Rec'd.

RECEIVED
JAN 6 1956
FEB 15 1956
BUREAU OF MINES
Denver, Colorado

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

OPERATOR'S UNIT COST AND PROGRESS REPORT

Month of Oct. 18 - Nov. 25 1955 Docket No. DMEA 3762 Contract No. Idm-E870

Operator's Name Shannon Oil Co. Minerals Uranium

Address 603 Midland Savings Building, Denver 2, Colo.

OPERATION	UNIT	COSTS THIS MONTH	UNITS THIS MONTH	COSTS TO DATE	UNITS TO DATE	UNIT COSTS TO DATE	AUTHORIZED BY CONTRACT Units	AUTHORIZED BY CONTRACT Unit Costs
			(STAGE I)					
Bulldozing	Ft.	None	None	None	None	None	16	12.50
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	Ft.	2070.25	591½	2070.25	591½	3.50	940	3.50
Non-core	Ft.	6756.75	3861	6756.75	3861	3.50	3600	1.75
Auger/ Radiometric/Logging	Ft.	396.00	3960	396.00	3960	.10	4460	.10
Trenching			(FIXED UNIT COSTS)					
Incidental allowances	Ft.	2537.92	4452½	2537.92	4452½	.57	4540	.57
Chemical Assays	Ea.	180.00	36	180.00	36	5.00	90	5.00
TOTAL DISTRIBUTED COSTS		11,940.92		11,940.92				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS		11,940.92		11,940.92				11,940.92

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this report is correct and complete to the best of their knowledge and belief.

Date JAN 6 1956 Operator Shannon Oil Co.

Per Glen W. Pryor Title Field Supt.

NOTE.—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.

REMARKS:

(Instructions on reverse)

(For Government use only) William D. McMillan

INSTRUCTIONS

Preparation of Form MF-104A—Operator's Unit Cost and Progress Report.—Applicable places on Form 104A should be filled in by the Operator. The purpose of this form is twofold as follows: (1) to furnish the supervising engineers and other administrators with statistical information necessary to better determine the progress of the project; and (2) to furnish more permanent information on mining costs for future use. The more important phases of operation on which permanent information is desired have been outlined in the form. There are blank lines, however, for those unusual phases which may need to be reported for a particular project. It will be necessary for the Operator to distribute his costs among the applicable phases reported with the exception of three items the costs of which are not to be distributed by the Operator. These three items are: "Operating Equipment Purchased", "Initial Rehabilitation and Repairs", and "New Buildings, Improvements, etc." The reason for not distributing these items on a monthly basis is doubtless clear to the Operator, since such distribution might well overstate the cost for any one month or period short of the entire contract period.

Form MF-104A has been designed to tie in with Form MF-104 for both monthly and cumulative costs. The "Total Costs" on Form MF-104A for each month should equal the monthly "Total Costs" as reported on Form MF-104. This is also true of the "Total Costs To Date".

In preparing Form MF-104A, it will be necessary frequently to distribute certain costs over a number of items. For instance, supervisory and engineering costs may have to be distributed over several phases, such as, drifting, crosscutting, raising, etc., provided that these items were reported active for the month. Such distributions should be made on the basis of time spent on the various phases, on man days of labor charged to such phases, or on some other equitable basis. "Operating Equipment", "Initial Rehabilitation and Repairs", and "New Buildings Improvements, etc.", will be distributed to the several phases of the project by the Washington Office of DMEA at the close of the project if determined necessary. The last two columns headed "Authorized by Contract" will be filled in by the Operator if such information is found in the contract. This information is usually a part of Exhibit "A" of the contract. A space for remarks has been provided for the use of the Operator to call attention to any unusual circumstances causing excessive or disproportionate unit costs.

GPO 872894

DMEA
Date Rec'd.
JAN 12 1956
BUREAU OF MINES
Denver, Colorado

REPORT

Docket No. DMEA 3762 (Uranium)
Contract No. Idm 8-370
Stage X

SHANNON OIL CO.

NARRATIVE REPORT

Stage I of the uranium exploration program authorized under DSA Contract No. Idm-8870, Docket No. 3762 with Shannon Oil Co. as the Operator was initiated on October 18, 1953. The leasehold covered by this Contract is nominally called the "Laymon Lease" and consists of approximately 160 acres of land in Crook County, Wyoming, described as follows:

Township 52 North, Range 66 West, 6th P.M.

Section 27: N½NE¼ & W½NW¼

The work hereinafter described was accomplished under the direct supervision of Glen W. Fryer, Field Superintendent of Shannon Oil Co. The services of Bruce Pearson, Consulting Geologist, of Denver, Colorado were retained throughout the operation. Livingston & Wilson Exploration Drilling of Longmont, Colorado were the drilling contractors.

The Atomic Energy Commission Carlile Projects No. 1 & 1a (Thorn Ridge) had, during 1954 and early 1955, drilled 27 core-holes on the Laymon property. Of these 27 holes, 11 showed significant mineralization. Of the 11 mineralized holes, 6 had uranium ore occurrences of .1% or better.

Stage I of subject Contract authorized four 50 ft. diagonal offset holes around each of AEC core holes No's. 708, 735, 743 and 746 and two 50 ft. diagonal offset holes to AEC core hole No. 704, one to the northeast and one to the southeast of said hole. By the closely spaced drilling so authorized, it was hoped that continuity and basic trends of mineralization around the most favorable AEC holes might be determined.

The drilling program started around AEC's 743 drill hole. Starting at the northeast station, this was assigned the number 7431, thence clockwise to 7432, 7433 and 7434. This numbering system was used on each succeeding station.

Core points and total depth were closely correlated with AEC's radioactric logs. By such correlation, each area of potential interest was cored at total paid core drilling totalling 591½ ft. as against 940 ft. authorized in Stage I. A discrepancy between the above figure and total footages of cores described in holes 7462, 7463 and 7464 will be noted. In these three holes, in the interval between 200 and 210 ft., where plug bit drilling was ordered, contractors actually cut 10 ft. cores but operator was billed for plug bit drilling only. Contractor used this method rather than to ream down the holes since additional coring would start at the 210 ft. interval in each instance. Thusly, 30 ft. of additional core appears in the core recovery summary and in the core descriptions.

Having underrun authorized coring footage, it follows that additional plug bit drilling was done. 3600 ft. on non-core drilling was authorized and actually 3861 ft. was accomplished. Total core and non-core drilling authorized was 4540 ft. Total core and non-core drilling accomplished was 4452½ ft., or well within the authorization.

All cores were scanned for radioactivity and 36 samples of 1 ft. sections or less were submitted for assay. Full results on chemical assays appear later in this report.

All drill holes were logged radiometrically and copies of the logs on each drill hole are made a part of this docket. A Mount Sopris scintillation counter, model No. SC 130 GF with recorder attachment, was used for logging on all holes except No's. 7431 and 7432. These two holes were logged by the AEC, due to temporary failure of our rented equipment.

The logs are, for the most part, self-explanatory. Lithology and core recovery are noted to the left of the left-hand margin; chemical assay figures are inside the left-hand margin at the depth of occurrence; and depth is indicated inside the right-hand margin. Log scales appear directly on the traainge.

A scale for reading radiometric values on the Mount Sopris log is included with the logs, and maximum radiometric readings appear on each log in red. The following values on AEC logs are accurate in the level of values encountered:

1000 c/s = .025% U_3O_8
2000 c/s = .05 % U_3O_8
4000 c/s = .1 % U_3O_8

It should be noted that no compensation is claimed for logging on the holes probed by the AEC. Reimbursement is claimed on only those holes actually probed by the rented counter.

Little difficulty in probing to bottom was encountered except on hole No. 7432. Since this was the initial hole drilled, we went well past the Morrison contact to be sure we had it. We then ran probing casing and chased cuttings and well caho to bottom, fouling the casing for a few feet. Since our probe reached within 2 ft. of the Morrison contact, we were satisfied with the probing depth. We dispensed with probing casing after the first hole.

After each hole was bottomed and probed, it was plugged with a metal cap below plow depth and leveled. Holes may be easily relocated by the use of a magnetic pipe finder. Stakes in cultivated areas will not last and monuments are a nuisance to the land-owner. Severe weather conditions, ranging from -18° F and snow causing lost time due to equipment failure, to temperatures in the 50-60° F range with resultant thaws, causing difficulty in moving equipment, slowed the work considerably and added measurably to costs incurred. Actual costs as incurred in Stage I appear on a following sheet.

Core recoveries were disappointing, and in the basal Lakota recoveries were so small that significance was almost lost. Also, in this basal zone diamond bit life was of very short duration. In any future exploration in this area, would recommend air drilling, dust samples, radiometric logging and carrying on the drilling during spring and summer months.

CONCLUSIONS

The finding of significant mineralization in but 5 of 18 holes drilled, considering that they were drilled adjacent to known A.E.C. ore holes, is disappointing. These findings, correlated with those of the A.E.C., preclude any theory of continuity or massiveness over any wide area.

Sporadic occurrence of ore in apparently small pods, volume and values encountered and depths at which encountered makes economic recovery, by conventional mining methods, impractical at this time.

Glen W. Pryor
Field Superintendent

January 6, 1956

ACTUAL EXPENSE - DHEA (STAGE I)

Drilling	$ 10,228.90
Radiometric Logging	396.00
Chemical Assays	189.70
Technical Services (Geology)	2,500.00
Automobile Expense	345.04
Truck Expense	231.92
Supervision	1,534.62
Personal Expense, Supervisor	386.47
Core Boxes	79.60
Sample Sacks	10.82
Freight (above)	13.09
Core Shed Rental	25.00
Hole Plugs	22.50
Core Cutter	141.82
Surface Damage Compensation	350.00
Miscellaneous	60.75
	$ 16,516.23

G E O L O G I C A L R E P O R T

SHANNON OIL COMPANY

LAYMON LEASE
CROOK COUNTY, WYOMING

December 21, 1955

GEOLOGICAL REPORT

Shannon Oil Company - Laymon Lease
Crook County, Wyoming

Beginning October 19, 1955, a core-drilling program was conducted by the Shannon Oil Company on a mining lease covering approximately 160 acres of land in Crook County, Wyoming of the following description:

Township 52 North, Range 66 West, 6th P.M.

Section 27: East Half of the Northwest Quarter
and West Half of the Northeast Quarter

Purpose of the program was to evaluate the uranium ore-bearing or radioactive zones found in the Lakota formation in five of twenty-seven core holes drilled by the Atomic Energy Commission on the property in 1954 and the early part of 1955. The work was conducted in accordance with the provisions of a contract with the Defense Minerals Exploration Administration.

Eighteen holes were drilled, completing the drilling under Stage I of this contract. Of the eighteen holes, twelve were carried completely through the Lakota formation into the Morrison formation. Work was commenced around A.E.C. Core Hole No. 743, using one drilling rig. A second rig was employed beginning with the second group of holes, around A.E.C. Core Hole No. 746, and the two rigs were used continually until completion of the drilling on November 25th. Operations during that period were interrupted twice for four-day rest periods; otherwise operations were continuous except for shut-downs because of weather and equipment failure.

The drill sites and elevations were surveyed from the A.E.C. core holes, which were located with the assistance of Mr. Baker of the A.E.C. at Carlile, Wyoming. All locations were staked 50 feet from the A.E.C. holes along lines at angles of 45° from true North or South, with the exception of Hole No. 7431, which was staked only 46 feet from A.E.C. Hole No. 743 to avoid a group of trees.

Of the two drilling rigs employed, only one was equipped to drill with either air or water, and the standard practice with this rig was to drill with air to a depth just above the first coring point, then to mix bentonite and water for coring. The second rig drilled with mud from the surface to total depth. In the first hole drilled, No. 7432, shot hole casing was run before probing, but this was found to be unnecessary and the practice was abandoned. In a few cases it was necessary to recondition holes for probing, but these were the exceptions.

Operations were conducted for the most part on cultivated land where movement of vehicles was very difficult during wet weather or after thaw. Extreme cold caused loss of time from equipment failure,

and under moderate weather conditions work could have been completed in considerably less time. The property is easily accessible from a paved highway 1½ miles to the west, and personnel employed on the project commuted daily from Moercroft.

GEOLOGY

The topography locally is of gently rolling terrain, although there are high hills and bluffs and steep canyons in the vicinity. At the surface several feet of soil overlie the Dakota bedrock. Typically the Dakota is present from the surface to a depth of 50 feet and consists of massive, thin-bedded, and cross-bedded, fine-grained buff, light gray and brown sandstones, often limonitic and iron-stained, with interbedded shales and sandy shales. The Dakota is well-exposed in a narrow canyon at the north end of the property, but cross-bedding and the very low angle of dip make measurement of the dip and strike difficult. Dip at this location is estimated to be 1° South 30° West.

Underlying the Dakota is the Fuson, approximately 100 feet of buff and gray sandy shales and thin, flaggy, fine-grained sandstones and siltstones. The contact of the Fuson with the underlying Lakota is difficult to distinguish in the cores and is apparently gradational in this locality, the Lakota becoming more sandy with increasing depth.

The Lakota is well-exposed at the location of the Homestake uranium mines approximately one mile to the East. There the upper Lakota is an intensely cross-bedded, fine-grained to medium-grained, light gray sandstone, weathering to a reddish color, containing hematitic and limonitic material and abundant grains and specks of white clay mineral in bands. There is also some soft, buff and yellow clay material and abundant soft, black, "rubbly", carbonaceous material in thin laminations and layers interbedded with the sandstone. Carnotite and a black radioactive mineral are prominent, more so along the bedding planes than in the sandstone itself. The lower part of the Lakota is coarse-grained, conglomeratic and cross-bedded, containing an abundance of black and dark gray siliceous pebbles imbedded in a light gray sandstone or sandy clay matrix. The pebbles are small in size for the most part. In the cores from the Shannon holes the section between the upper and lower Lakota zones is mostly of vari-colored sandstones, siltstones and shales, apparently barren of any uranium mineralization.

The deepest horizon penetrated by the core holes is the top of the Morrison formation, which is a "tough", sticky, pyritic, dark gray, brownish-gray, dark greenish-gray or olive shale, very difficult to core with the diamond bit.

From the table showing core recoveries, it is apparent that the percentage of recovery was noticeably low around the A.E.C. Hole No. 743. This was due largely to lack of familiarity with the area on the part of personnel operating the rigs and supervising the coring. Core recovery improved as personnel became more experienced. The lower Lakota section consisted for the most part of conglomerates of dark gray to black, rounded

or subrounded, siliceous pebbles, in some cases loose or very poorly cemented. Recoveries in this zone were consistently very low, and it is believed that most of the loss was from this conglomeratic material. The four holes drilled around A.E.C. Core Hole No. 735 were drilled and cored into the Morrison formation, and the small amount of the basal Lakota which was recovered showed an abundance of pyrite. The combination of hard chert pebbles and clusters of pyrite in this lower zone caused a great deal of damage to the diamond core bits. Three bits were badly damaged and one left stuck in the No. 7353 hole at this locality. It is believed likely that loose gravel may have settled around the top of the bit, sticking the pipe and causing the loss of the lower part of the core assembly. This was the only hole in which difficulty was encountered with stuck drill stem.

ORE DEPOSITS

The core holes drilled by the Atomic Energy Commission indicated in general the presence of two zones of uranium mineralization, both in the Lakota formation, one being near the contact with the underlying Morrison formation and one near the upper Lakota boundary.

In the upper zone the strongest radioactivity was found in the holes drilled around A.E.C. Hole No. 746, where the radioactive material found in the cores was a soft, black, sometimes sooty mineral found associated with carbonaceous material, as cementation or interstitial filling in the sandstone, and in streaks independent of the carbonaceous material. The mineral was always black in color in the cores as they were taken out of the ground, but after several days exposure at the surface the mineralized portions of the cores showed a light yellow coating, due to oxidation or dehydration or other chemical change resulting from the exposure to the air. A.E.C. geologists in the area stated that the mineral is a marketable uranium ore when found in sufficient quantity and grade, but has not yet been positively identified.

Determination of the grade of ore present may be calculated approximately from the chemical assays which were taken of mineralized sections of the cores and data from the radioactivity surveys of the core holes. Samples for assay were taken by longitudinally splitting the cores (size NX) in half. With the exception of two holes, No. 7432 and No. 7431, which were surveyed by Mr. Wolf of the A.E.C., all the holes were surveyed with a Mount Sopris Model SC-130 Scintillation Counter and probe, with the data being recorded on an Esterline-Angus recorder. The vertical scale used was 3/4ths inch (one division on the chart) to four feet. The instruments were calibrated to read on the charts directly in percentages of U_3O_8 up to a maximum of 1.0% ore. Thus, zero is on the extreme left of the charts and the maximum readings on the right-hand side of the charts are as follows for the six range settings on the instrument:

Range	% U_3O_8
.025	0.005
.05	0.01
.25	0.05
.5	0.1
2.5	0.5
5.0	1.00

Most of the surveys were run using the .05 Scale for the initial survey and resurveying the more radioactive zones with less sensitive settings. All surveys were necessarily started at the bottom of the hole, recording as the probe was reeled out of the hole, and the time constant used was the slower of the two on the instrument, probably accounting for the apparent vertical lag between assay values and radiometric values. Logging speed through the Lakota section was kept as near ten feet per minute as possible.

The table of maximum percentages of U_3O_8 found in each hole shows that of the holes drilled by Shannon Oil Company, only five showed 0.1 percent or more, which should be considered a minimum value for ore and which is the least which would be accepted by most ore-buying stations. The most favorable zone of mineralization found is in the vicinity of A.E.C. Hole No. 746. Estimates of volume and values at the location indicate that the ore at the depths found is not in sufficient quantity nor of sufficient grade to warrant mining operations. Inasmuch as this is the most favorable area, it follows that other mineralization, such as around A.E.C. Hole No. 735, is likewise not commercial in quantity or grade.

CONCLUSIONS

It is possible that further exploration on the property could find one or more commercially mineable uranium ore bodies, but in view of the lack of success of the Atomic Energy Commission and the further lack of success of Shannon Oil Company, the prospects for finding such ore bodies are considered poor. The uranium mineralization found so far has been in amounts not sufficient to warrant the expense of mining operations, which would have to be at depths in excess of 175 feet. In the event any additional development of the property is contemplated, at least part of any such effort should be spent in further evaluation of the 746 area. Otherwise, any additional core drilling might best be done in areas not yet tested, rather than in proximity to the holes which have been drilled.

Bruce Pearson

Bruce Pearson,
Geologist

MAXIMUM PERCENTAGES OF U_3O_8 FOUND IN EACH HOLE

Hole No.	Percentage U_3O_8 Chemical Analysis	Percentage U_3O_8 Radiometric (from Hole Surveys)
7041	None Made	0.005
7042	None Made	0.01
7081	0.01	0.05
7082	0.01	0.05
7083	0.29	0.2
7084	None Made	0.009
7351	0.08	0.5
7352	None Made	0.09
7353	None Made	0.05
7354	0.10	0.3
7431	None Made	* 0.03
7432	None Made	* 0.007
7433	0.08	0.02
7434	Trace	0.03
7461	0.23	0.25
7462	0.08	0.05
7463	1.07	0.5
7464	None Made	0.005

* - Surveys run by A.E.C. Values less than 0.10.

THE BROWN LABORATORY
2263 Broadway
Grand Junction, Colorado

CERTIFICATE OF ANALYSIS

Date 12-1-55
Order No. 5406-8

Lab No.	Your No.	Description	$\%U_3O_8$	$\%V_2O_5$	$\%CaCO_3$
5406-1	7081	174-175	0.01	Nil	
5406-2	7082	179-180	0.02	0.23	
5406-3	7082	180-181	0.04	0.33	
5406-4	7083	170-171	0.01	0.02	
5406-5	7083	171-172	0.05	0.20	
5406-6	7083	176-177	0.29	0.79	
5406-7	7083	178-179	0.28	0.28	
5406-8	7083	179-180	0.09	0.30	
5406-9	7351	268-273	0.08	0.21	
5406-10	7354	Depth 271	0.10	0.03	
5406-11	7433	180-180'8"	Trace	Nil	
5406-12	7433	185-186	0.08	0.03	
5406-13	7434	176-177	Trace	Nil	
5406-14	7461	183-184	0.03	0.07	
5406-15	7461	184-185	0.06	0.24	
5406-16	7461	185-186	0.23	0.67	
5406-17	7461	186-187	0.15	0.21	
5406-18	7461	189-190	0.23	0.30	
5406-19	7462	176-177	0.01	Nil	
5406-20	7462	177-178	Trace	Nil	
5406-21	7462	178-179	Trace	Nil	
5406-22	7462	180-182	0.08	0.21	
5406-23	7462	193-194	0.06	0.08	
5406-24	7463	180-181	Trace	Nil	
5406-25	7463	181-182	0.01	0.01	
5406-26	7463	182-183	0.02	0.07	
5406-27	7463	183-184	0.10	0.18	
5406-28	7463	184-185	0.29	0.63	
5406-29	7463	185-186	0.03	0.03	
5406-30	7463	186-187	0.38	0.33	
5406-31	7463	187-188	0.40	0.72	
5406-32	7463	190-191	1.07	1.03	
5406-33	7463	191-192	0.28	0.67	
5406-34	7463	192-193	0.02	Nil	
5406-35	7463	198-198.5	0.01	0.01	
5406-36	7463	200-201	0.01	Nil	

ESTIMATE

Estimate of the value of ore in the vicinity of A. E. C. Core Hole No. 746, based on data from five core holes:

Maximum thickness of ore	9 ft.
Average thickness of ore	4.5 ft.
Area	12,000 sq. ft.
Volume of ore	54,000 cu. ft.
Estimated volume per ton of ore	12 cu. ft.
Total weight of ore	4,500 tons
Average grade of ore	0.25 %
Total net weight of U_3O_8	22,500 lb.
U_3O_8 over 0.20% grade (est. 60% of total)	13,500 lb.
Price per lb. of 0.20% ore	$3.50
Value of ore over 0.20% grade	$47,250
U_3O_8 under 0.20% grade (est. 40% of total)	9,000 lb.
Price per lb. of 0.15% ore	$ 2.50
Value of ore under 0.20% grade	$22,500
Total value of U_3O_8	$69,750
Average grade of V_2O_5	0.6 %
Total net weight of V_2O_5	54,000 lb.
Price per lb. of V_2O_5	$0.31
Value of V_2O_5	$16,740
Total combined value of U_3O_8 and V_2O_5	$86,490

Possible bonuses and allowances:

Maximum initial production bonus for 0.20% U_3O_8	$35,000
Development allowance ($0.50 per lb. of U_3O_8)	$11,250
Total	$46,250

CORE RECOVERIES

	UPPER LAKOTA ZONES			LOWER LAKOTA ZONE		
Hole No.	Footage	Recovery	Percent	Footage	Recovery	Percent
7041	15'	10' 8"	71	24'	7' 6"	31
7042	15'	13'4"	89	28'	6' 4"	23
7081	22'	14' 6"	66	6'	1' 2"	19
7082	23'	18' 3"	79			
7083	26'	19'10"	76	6'	0	0
7084	24'	17' 6"	73			
7351	15'	15'	100	13'	1'10"	14
7352	10'	10'	100	15'	1'	7
7353	16'	12'10"	80	12'	1' 6"	13
7354	15'	12' 2"	81	13'	3' 4"	26
7431	32'	13'10"	43			
7432	27'	9' 4"	38	12'	6½"	5
7433	30'	15' 5"	51			
7434	30'	14' 5"	48	9' 6"	1'11"	20
7461	35'	17' 5"	50	9'	2' 5"	27
7462	45'	35' 9"	79			
7463	45'	24' 8"	55	4'	1' 5"	35
7464	45'	24' 3"	54			
	470'	299' 2"	64	151' 6"	28'11½"	19

CORE HOLE NO. 7041

Core #1 175-183', Recovered 5':

2'8"	firm, light gray, fine-grained, massive, well-sorted, porous, permeable sandstone containing large, rounded siliceous pebbles in the bottom 2 inches
2'4"	firm, dark gray, slightly bentonitic shale with small, dark gray, rounded chert pebbles scattered thinly throughout; slightly sandy in bottom 6"; scattered pyrite crystals in small amounts One very thin zone of weak radioactivity 2 feet from the top of the core; no abnormal radioactivity in remainder of core.

Core #2 183-190', Recovered 5'8":

7"	hard, dense, gray, silty, siliceous shale with a few small, dark gray, rounded chert pebbles
2'7"	firm, slightly brownish-gray shale containing scattered dark gray chert pebbles and spots and large inclusions of pyritic and siliceous material
1'6"	firm, gray, pebbly, sandy shale containing an abundance of small, rounded, mostly dark gray pebbles; firmer and lighter in color than shale above
1'	firm, light greenish-gray shale, laminated with soft, light gray, fine-grained sandstone; approximately 60% shale, 40% sandstone. No abnormal radioactivity.

Core #3 226-246', Recovered 3½':

2'6"	friable and loose sandy conglomerate of dark gray and black rounded chert pebbles, interbedded and partially cemented with soft, sticky, light greenish-gray clay and dark brown and brownish-gray shale.
10"	loose, gray, sandy conglomerate of dark gray and black subround chert pebbles, mostly less than ¼ inch in diameter.
2"	firm, gray-banded, fine to medium-grained sandstone with predominance of dark grains cross-bedded and intercalated with sandstone of lighter colored grains One very small spot of radioactivity 1 foot from the bottom.

CORE HOLE NO. 7041 - continued

Core #4 246-250', Recovered 4':

4' firm to hard, dense, dark, slightly greenish-gray shale with pyrite in spots throughout and one large mass of pyritic material at the very top of the core.

TOP MORRISON - 246'

CORE HOLE NO. 7042

Core #1 170-185', Recovered 13'4":

8'	firm, gray, fine-grained, massive, porous, permeable, well-sorted, sucrose sandstone with a few thinly scattered small spots of dark gray, sandy shale
3'10"	firm, gray, fine-grained, porous, permeable, well-sorted, massive sandstone with a few spots of pyrite.
1'6"	firm, sticky, dark brownish-gray shale

No abnormal radioactivity

Core #2 230-250', Recovered 3'4":

1'	firm to soft, friable, gray, fine-grained, porous, permeable, cross-bedded, well-sorted sandstone
2'4"	firm, partially friable, gray, coarse-grained, medium-grained and fine-grained sandstone with the coarser and finer grains sorted and inter-bedded; becoming coarser over-all toward bottom; coarser grains are predominantly of dark gray and black chert.

No abnormal radioactivity

Core #3 250-258', Recovered 3': (Core jammed in core barrel)

11"	firm, dark gray, fine-grained, slightly shaly, porous, permeable sandstone
1"	soft, dark brown shale
2'	firm, sticky, dark gray and dark brownish-gray shale

No abnormal radioactivity

TOP MORRISON - 252'

CORE HOLE NO. 7081

Core #1 170-177', Recovered 6':

1'9"	firm, gray, very fine-grained, massive, well-sorted, slightly shaly sandstone
2'10"	firm, gray, fine-grained to very fine-grained, shaly sandstone with laminations of gray, silty shale; thin horizontal streaks of black, carbonaceous material
1'5"	firm, gray, fine-grained sandstone with a few laminations of gray shale and a few streaks of black carbonaceous material in top 1 foot

No abnormal radioactivity

Core #2 177-184', Recovered 1'4":

1'2"	firm, gray, fine-grained, massive, porous, permeable, well-sorted sandstone
2"	firm to hard, black pyritic, carbonaceous, lignitic material with vegetal remains and laminations of hard, dense, light gray, fine-grained sandstone

No abnormal radioactivity. Core cut uniformly throughout.

Core #3 184-187', Recovered 3':

3"	firm, gray, fine-grained, porous, permeable, well-sorted sandstone
3"	firm, gray, shaly conglomerate, consisting of dark gray and white pebbles less than 2/10ths inch in diameter, with some interbedded, fine-grained sandstone and a few fragments of black, carbonaceous material
10"	hard, dense, brownish-gray silty shale
1'6"	firm to hard, dense, light gray, shaly siltstone with a small amount of black, carbonaceous materbal in the top 2 inches.

No abnormal radioactivity

Core #4 228-233', Recovered 4'2":

4'2"	hard, sticky, dark brown shale

No abnormal radioactivity

Core #5 255-261', Recovered 1'2":

2" sticky, greenish-gray clay
6" loose gravel consisting of well-sorted, light gray and dark gray, subround chert pebbles and some soft gray clay pebbles, averaging ¼ inch in diameter
6" sticky to firm, olive and dark greenish-gray shale

No abnormal radioactivity

TOP MORRISON - 258'

CORE HOLE NO. 7082

Core #1 167-172', Recovered 4'3":

2'8"	firm, light gray, very fine-grained shaly sandstone with a few streaks of light-gray, firm, sandy shale
1'7"	firm, gray, fine-grained sandstone with small fragments and paper-thin partings of black carbonaceous material in thin streaks; pyritic in streaks; a few thin laminations of gray, sandy shale

No abnormal radioactivity

Core #2 172-177', Recovered 4':

1'	firm, light gray, fine-grained, massive, well-sorted, porous, permeable sandstone with scattered spots and streaks of soft, gray clay and a few thin laminations of black carbonaceous material
3'	firm, light gray, fine-grained, massive, well-sorted, porous, permeable sandstone; no visible mineralization

No abnormal radioactivity

Core #3 177-190', Recovered 10':

2'6"	firm, gray, fine-grained, porous, permeable sandstone with occasional horizontal streaks of soft, gray clay and dark gray clay up to 1 inch in thickness; questionable, very weak radioactivity in a few scattered streaks
3"	sandstone as above with hard black cementation in an irregular horizontal streak; some pyrite; fair radioactivity
1'3"	firm to soft, gray, fine-grained, shaly sandstone with small spots and irregular streaks of light gray, dark gray and bluish-gray shale; slight brownish coloration in streaks; weak radioactivity in streaks
2"	soft, bluish-gray clay with small amount of black material in paper-thin horizontal streaks; weak radioactivity
4'6"	hard, dense, light gray, shaly siltstone with spots of bluish-gray silty shale; no visible mineralization; no abnormal radioactivity
1'4"	soft to loose, light gray, fine-grained shaly sandstone with specks of soft, bluish-gray shale; no abnormal radioactivity

CORE HOLE NO. 7083

Core #1 165-170', Recovered 5':

5'	firm, light gray, fine-grained, slightly shaly sandstone, interbedded with firm, light gray, very fine-grained, slightly shaly sandstone; containing a few thin streaks of sandy shale in the top 2 feet, a very few small lignitic or carbonaceous fragments in a few spots; no visible mineralization; no abnormal radioactivity

Core #2 170-178', Recovered 7':

1'8"	firm, light gray, fine-grained to very fine-grained sandstone with a few dark gray shale laminations and many horizontal streaks of black carbonaceous material; very weak radioactivity throughout
4'9"	firm, light gray, very fine-grained, porous, permeable sandstone; slightly shaly to shaly in streaks, with a few streaks of light gray, sandy shale in the second foot; pyrite in scattered clusters, and a few very thin partings of black carbonaceous material; very weak radioactivity throughout
7"	firm, gray, fine-grained sandstone with carbonaceous material, soft gray clay and pyrite in the top 2 inches; bottom 4 inches contain very soft black mineral in thin streaks; good radioactivity in one streak, less than 1 inch thick

Core #3 178-186', Recovered 4':

2'5"	firm, gray, fine-grained, porous, permeable sandstone with many thin horizontal streaks of black material with carbonaceous appearance; sandstone dark gray in top 1'3" and lighter gray in bottom 1'2"; good radioactivity in top 1 foot and fair to weak radioactivity in remainder; radioactive material is present as dark gray to black cementation
4"	firm to hard, gray, sandy conglomerate consisting mostly of soft, gray clay and white siliceous clay pebbles approximately 2/10ths inch in diameter; contains a few fragments of black pyritic carbonaceous material; no abnormal radioactivity
5"	firm, dark brownish-gray shale; no abnormal radioactivity
10"	firm, dense, light gray, silty shale; no abnormal radioactivity

Core #4 232-237', Recovered 3'10":

2'2"	firm, sticky, dark brown shale
6"	hard, dark brown, silty shale
2"	hard, dark brown, very shaly siltstone
6"	hard, brown, red, yellow, gray and buff limonitic and hematitic very fine-grained, slightly shaly, tightly cemented sandstone
6"	friable, reddish brown, sandy conglomerate with abundance of limonitic and hematitic material, composed mostly of pebbles of dark gray chert, 1/10th inch in diameter; some white siliceous pebbles

Core #5 250-256', No Recovery

Bits and pieces of sticky, dark greenish-gray shale in watercourses of core bit

TOP MORRISON - 253' by coring time

CORE HOLE NO. 7084

Core #1 166-174', Recovered 6½':

3"	hard, dense, dark gray, sandy shale
6'3"	hard, dense, gray, fine-grained, tightly cemented, shaly sandstone with small spots and streaks of gray, sandy shale throughout, some gray shale laminations; scattered thin streaks of dark brown and black carbonaceous, lignitic material in bottom 1½'; no visible mineralization

No abnormal radioactivity

Core #2 174-182', Recovered 4'10":

4'10"	firm, gray and dark gray, fine-grained, massive, porous, permeable, "clean" sandstone with light gray and dark gray streaks; becoming slightly coarser-grained from top to bottom; no abnormal radioactivity

Core #3 182-190', Recovered 6'2":

2'2"	firm, partially friable, dark gray, fine-grained to medium-grained, massive, porous, permeable, "clean" sandstone
6"	firm, dark gray, pyritic, sandy shale with gray siliceous pebbles ¼ inch in diameter imbedded in the shale in horizontal streaks
3'6"	firm to soft, light gray, very shaly siltstone, interbedded and laminated with light gray and slightly bluish-gray silty shale

No abnormal radioactivity

CORE HOLE NO. 7351

Core #1 185-193', Recovered 8':

1'6"	soft to firm, light gray, dense, tightly cemented, shaly siltstone, grading to very fine-grained shaly sandstone with scattered small specks and fine streaks of black (iron oxide?) mineral
1'6"	dense, light gray, very fine-grained, well-sorted sandstone, interbedded with gray, fine-grained, poorly sorted sandstone; some coarse grains and pellets of light gray clay; has irregular banded appearance
4'3"	firm to hard, light gray, fine-grained, cross-bedded, slightly shaly sandstone, containing light gray "kaolinitic" cementation; occasional streaks of darker, coarser and more poorly sorted sandstone
9"	dense, light gray, very fine-grained sandstone with very light gray "kaolinitic" cementation as above

No abnormal radioactivity

Core #2 193-200', Recovered 7':

5'2"	firm, light gray, very fine-grained, well-sorted, intensely cross-bedded sandstone with "kaolinitic" clay cementation, containing one 6-inch thick zone of predominantly dark gray to black, with some white, siliceous, irregularly shaped pebbles less than 2/10ths inch long; a few streaks of pyrite or marcasite
1'10"	firm, light gray, shaly siltstone with spots and streaks of soft, green and greenish-white clay, "kaolinitic" cementation, and a few thin streaks of pyrite

Core #3 260-268', No Recovery:

A few chert pebbles caught in the core-catcher; may have been loose conglomerate or gravel

Core #4 268-273', Recovered 1'10":

3"	conglomerate of fine and coarse dark chert pebbles imbedded in soft, sticky, white clay; abundant pyrite in coarsely crystalline masses
1'4"	hard, sticky, dark brownish-gray shale with abundance of coarsely crystalline pyrite and spots of light gray coloration; one thin streak of radioactivity in top 6 inches

CORE HOLE NO. 7351 - continued

Core #4 - continued:

3" soft, sticky, light greenish-gray clay with abundance of pyrite.

TOP MORRISON - 271'

CORE HOLE NO. 7352

Core #1 185-195', Recovered 10':

7"	firm to hard, dark gray, sandy shale laminated with hard, dense, light gray, fine-grained, shaly sandstone; slightly conglomeratic, with a few small, gray chert pebbles and a few pebbles of soft, light gray clay
2'10"	soft, light gray, shaly siltstone with scattered thin spots and laminations of silty clay; some cross-bedding in bottom 1 foot; a few small spots of pyrite
2'6"	firm, light green bentonitic shale
2'4"	firm to hard, light grayish-green, silty shale with occasional thin laminations of light greenish-gray shaly siltstone
1'9"	firm, dense, light gray to white, shaly siltstone with soft, white "kaolinitic" cementation and thin laminations of light gray, very silty shale

No abnormal radioactivity

Core #2 260-268', Recovered 3": (Core head damaged on eighth foot)

3"	firm, gray, very shaly conglomerate of rounded, dark gray and gray chert pebbles, mostly less than ¼" in diameter, in gray shale matrix; some buff, fine-grained sandstone, some gray sandstone; core cut uniformly throughout;

No abnormal radioactivity

Core #3 268-275', Recovered 9":

6"	soft, gray, shaly, sandy, pyritic chert pebble conglomerate, containing pebbles up to 1" in diameter in dark gray clay matrix; streaks of gray shale and white clay; streaks of brown, fine-grained, very shaly sandstone; pyritic at bottom
3"	firm, sticky, dark, slightly-brownish gray shale

No abnormal radioactivity

TOP MORRISON - 274'

CORE HOLE NO. 7353

Core #1 177-189', Recovered 6'4":

1'5"	firm, gray, fine-grained, slightly shaly, thin-bedded sandstone with occasional thin, dark-brown and black carbonaceous streaks
3'1"	firm to hard, sticky, gray, brown and pale green bentonitic shale with a small number of black, rounded chert pebbles scattered throughout; a few small spots of pyrite
1'10"	firm, light gray to greenish-gray, bentonitic, conglomeratic, slightly sandy shale, grading to very shaly, sandy congomerate, containing abundance of black siliceous pebbles up to 2/10ths inch in diameter

No abnormal radioactivity

Core #2 189-193', Recovered 6½': (Partly from core above)

3'	firm, sticky, light green bentonitic shale with streaks and splotches of brown coloration
2'10"	hard, dense, light green, slightly siliceous shale, becoming lighter in color to a pale greenish-gray at bottom
8"	dense, white, shaly, well-sorted siltstone with soft, white "kaolinitic" cementation

No abnormal radioactivity

Core #3 260-266', Recovered 1½':

1'4"	firm, gray, coarse-grained, porous, permeable sandstone, consisting of black and white siliceous grains
2"	firm to hard, dark gray, pyritic, tightly cemented conglomerate, containing dark gray to black, subround pebbles up to ½" in diameter

No abnormal radioactivity

Core #4 266-272', No Recovery: (Stuck diamond core head)

TOP MORRISON - 271' by coring time

CORE HOLE NO. 7854

Core #1 185-195', Recovered 4'8":

8"	laminated, soft, bluish-green shale and dark brownish-gray shale with abundant pyrite
1'10"	firm to hard, brownish-gray shale with many laminations of bluish-green shale and reunded spots of buff bentonitic clay
4"	soft, white, shaly siltstone with white "kaolinitic" cementation
1'1"	pale green bentonitic shale; outer surface of core has lumpy appearance
9"	soft, white, "kaolinitic" shaly siltstone; no mineralization

No abnormal radioactivity

Core #2 195-200', Recovered 7½': (Partly from core above)

3'6"	firm, light green, bentonitic shale with scattered spots of pyrite
2'	firm, light gray, bentonitic shale, becoming silty in bottom 6 inches
2'	firm to hard, dense, white to light gray, shaly siltstone with occasional streaks of silty shale; pyrite in fine streaks and small clusters; very shale in top 6 inches

No abnormal radioactivity

Core #3 260-268', Recovered 1'4":

11"	firm, gray, medium-grained to coarse-grained sandstone, becoming gradationally coarser from top to bottom and gaining in abundance of dark siliceous grains
5"	firm to tightly cemented, gray, conglomeratic sandstone grading downward to sandy conglomerate, consisting predominantly of small, dark gray, siliceous pebbles; abundant pyrite

No abnormal radioactivity. Core head damaged; coring time changed on first foot

Core #4 268-273', Recovered 2':

2"	hard, dense, gray, coarse-grained, very pyritic sandstone and dark gray, fine, very pyritic conglomerate, consisting mostly of dark gray to black subround siliceous pebbles less than 2/10ths inch in diameter; fair radioactivity in few spots

CORE HOLE NO. 7354 - continued

Core #4 - continued: 1'10" sticky, dense, dark gray to black, slightly brownish shale

TOP MORRISON - 271'

CORE HOLE NO. 7431

Core #1 175-180', Recovered 3'8":

1'	firm to soft, friable, light gray, fine-grained, cross-bedded, porous, permeable sandstone, containing a very few, scattered, small clay particles and thin, flat, lignitic or carbonaceous particles; some pink and light red coloration
1'8"	firm to soft, light gray to buff, fine-grained, slightly shaly, thin-bedded sandstone, containing many streaks of red, pink and yellow coloration, scattered streaks and small nodules of soft, light gray shale and a few thin, scattered spots of soft, black carbonaceous or lignitic material
1'	firm, friable, buff to light gray, fine-grained, slightly shaly, cross-bedded sandstone with streaks of pink to light red coloration, scattered small nodules of gray clay and a few thin spots of lignitic material

No abnormal radioactivity

Core #2 180-185', Recovered 2':

1'4"	firm to soft, friable, pink to red, fine-grained sandstone with red grains and some soft red cementation; color changes to predominantly yellow with red streaks in the bottom 4 inches
8"	soft, friable to loose, buff, fine-grained, slightly shaly sand

No abnormal radioactivity

Core #3 185-190', Recovered 3'10":

7"	friable, varicolored, gray, pink, buff, red, and yellow, fine-grained, shaly, porous, permeable sandstone with small spots of gray shale
3'3"	firm, gray, very fine-grained, porous, permeable sandstone with a few irregular red hematitic spots, some black iron mineral and irregular dark discoloration; some fine black spots and grains in irregular streaks; a few very small spots of pyrite; streaks of pink, red and yellow coloration in the bottom 3" and in pale streaks thinly scattered throughout

No abnormal radioactivity

CORE HOLE NO. 7431 - continued

Core #4 190-195', Recovered 1'8":

4" firm, friable, pink, buff and gray, fine-grained, shaly, porous, permeable sandstone, containing small, thin streaks and spots of soft, gray shale; a few small spots of dark red cementation

1'4" firm, friable, light gray, porous, permeable sandstone with pale pink streaks and yellow coloration in streaks, a few scattered spots of gray clay and some very fine spots or grains of black mineral in bottom 2 inches

No abnormal radioactivity

Core #5 195-200', Recovered 1'10":

1'10" firm to soft, predominantly light gray, fine-grained, porous, permeable sandstone with a few thin horizontal partings of soft gray clay and red, pink and yellow coloration; some red hematitic cementation; a small amount of black mineral in small spots and grains in the bottom 2 inches

No abnormal radioactivity

Core #6 200-205', No Recovery:

Drilled very fast with little weight on bit

Core #7 205-207', Recovered 10":

½" hard, dense, white, red and buff, fine-grained, shaly, impermeable sandstone

7" soft, yellow, slightly sandy clay

2½" firm, friable, pink and buff, fine-grained, porous, permeable sandstone

No abnormal radioactivity

CORE HOLE NO. 7432

Core #1 175-185', Recovered 2½':

1'6"	soft, mushy, gray clay, largely cuttings and material not in place settled at the bottom of the hole
4"	soft, gray clay, slightly sandy at the extreme bottom
8"	firm, friable, light gray, fine-grained to very fine-grained, porous, permeable sandstone, containing soft, dark gray shale in very thin horizontal partings and streaks; very slight trace of radioactivity

(First 4' cored fast, last 6' cored slower)

Core #2 185-190', Recovered 1'9":

1"	hard, brown, dark brown, and yellow sandy limonite
1'1"	firm, friable, gray, fine-grained to very fine-grained, massive, porous, permeable sandstone, containing a very slight amount of dark gray clay in a few horizontal streaks
2"	firmly cemented, gray, very fine-grained sandstone with red hematite and dark brown limonite cementation; some pyrite
1"	friable, gray, fine-grained, porous, permeable sandstone, becoming shaly and clay-filled toward the bottom
½"	firm, dark gray and light gray, very shaly, very fine-grained sandstone, containing dark gray shale in horizontal laminations
3"	firm, dark gray, sandy clay
½"	firmly cemented to friable, gray, very fine-grained sandstone with streaks of red hematitic and limonitic cementation

No abnormal radioactivity

Core #3 190-195', Recovered 2":

2"	soft, gray clay with small spots of yellow clay; one small piece of finely crystalline pyrite and several small, rounded pieces of brown and yellowish-brown, sandy limonitic material. Recovery was in several lumps in core barrel, with no bedding evident

No abnormal radioactivity

CORRECTED MEASUREMENTS FROM 195' to 197';
DRILLED 197' to 198':

CORE HOLE NO. 7432 - continued

Core #4 198-201', Recovered 1'4":

½" soft, red and brown, lignitic, slightly sandy shale, containing fragments of plant remains

1'3½" soft, friable, buff and light gray, fine-grained, massive, porous, permeable sandstone, containing a few scattered red, tan, pink, yellow and gray colorations

No abnormal radioactivity. (Core cut uniformly throughout)

Core #5 201-205', Recovered 3'7":

2" firm, friable, light grayish-white, fine-grained, porous, permeable sandstone

10" soft, loose, white, fine-grained sandstone

7" soft, loose, yellowish-buff to reddish-brown, very fine-grained sandstone with abundant soft clay cementation

1' friable, buff to light gray, fine-grained sandstone with scattered seams of red hematitic and yellow limonitic material; some minute buff clay specks scattered throughout

9" soft, loose, buff, fine-grained sandstone with some soft clay material as cementation and fine to coarse specks of clay mineral scattered throughout

3" firm, friable sandstone as above

No abnormal radioactivity

Core #6 245-250', Recovered 3½":

2" firm, friable, light gray, fine-grained sandstone with red, maroon and yellow coloration in irregular spots and streaks

1½" light, gray, fine-grained sandstone with horizontal streaks of black and red iron mineral; partly conglomeratic, containing fine to coarse, rounded, black and white siliceous pebbles, some up to ½" in length

No abnormal radioactivity

Core #7 250-255', Recovered 3":

3" firm, friable, light gray, fine-grained, well-sorted sandstone with "salt-and-pepper" appearance.

No abnormal radioactivity

CORE HOLE NO. 7432- continued

Core #8 262-264', No Recovery

TOP MORRISON - 256'

CORE HOLE NO. 7433

Core #1 175-180', Recovered 4½":

3" firm, friable, gray, very fine-grained, shaly sandstone with paper-thin horizontal, light gray, shale laminations; trace of thin, platy, black carbonaceous material with appearance of plant remains in horizontal layers

1½" firm, gray, very fine-grained, porous, permeable sandstone, containing one thin horizontal streak of soft, dark gray shale in bottom one-half inch

No abnormal radioactivity (Coring time uniform throughout)

Core #2 180-183', Recovered 1'9":

8½" firm, friable, gray, fine-grained sandstone with small, thin, flat, irregular carbonaceous spots and streaks (plant remains in part) and several small streaks of pyrite

1' hard, dense, light gray, very shaly siltstone

½" firm, friable, gray, fine-grained sandstone laminated with soft gray shale (approximately 50% shale, 50% sandstone); small spots of carbonaceous material in the sandstone

No abnormal radioactivity

Core #3 183-185', No Recovery:

Cored uniformly fast

Core #4 185-190', Recovered 3'10½":

6½" firm, friable, gray, fine-grained, porous, permeable sandstone with light gray, slightly bluish-gray, and white clay in fine specks throughout; some small clusters of pyrite; some flat, very thin horizontal laminations of black to slightly brownish-black liguitic or carbonaceous material; gray clay cementation in streaks

3½" firm, friable, gray, fine-grained, porous, permeable sandstone with small pellets of soft gray clay and white siliceous (shale?) material averaging 1/10th inch in diameter in irregular masses and streaks; some scattered, small, thin liguitic particles

Core #4 - continued:

2½" sandstone as above, containing black carbonaceous-appearing, "woody"-textured material; pyritic, lustrous and radioactive, and in irregular masses lying across bedding planes

11" firm, friable, gray, fine-grained sandstone as above with irregular masses of clay pellets as above, containing a very few scattered ligaitic streaks, some fractures, with no mineralization in the fractures, and one small piece of black radioactive material as described above in the top 2 inches

11½" firm, friable, light gray, fine-grained sandstone with irregular horizontal streaks of gray clay cementation and a few small, thin, ligaitic or carbonaceous laminations

11½" firm, friable, gray, massive, fine-grained sandstone, containing small clusters of pyrite and red hematitic material in vertically elongated streaks in the bottom 4 inches

Core #5 190-195', Recovered 4':

3'8" firm to soft, friable, gray, massive, fine-grained, porous, permeable sandstone with a few scattered, vertically elongated streaks of red hematitic material which are more abundant in the top 1 foot; some few small clusters of pyrite; some red and yellow coloration in the bottom 6 inches

4" soft, gray clay and sandy clay, interbedded with soft, pink to red, fine-grained sandstone (approximately 80% clay, 20% sandstone)

No abnormal radioactivity

Core #6 195-199', Recovered 2'11":

2' laminated and interbedded, soft, gray clay and soft, friable, red, yellow and brown (predominantly red), fine-grained, porous, permeable sandstone (approximately 70% clay, 30% sandstone), recovered from the core barrel in lumps and irregular masses; some hematite and other iron mineralization in scattered streaks; approximately 1" of buff, fine-grained, porous, permeable sandstone in the bottom 6 inches

Core #6 - continued:

11" firm, friable, buff, fine-grained, porous, permeable sandstone, recovered mostly in discs ½ inch thick, containing streaks of pink, salmon and dull yellow coloration and a few specks of soft gray clay in the bottom 6 inches

No abnormal radioactivity

Core #7 - 199-205', Recovered 2½': (Except for bottom 1 foot the core was dumped from core barrel and mixed so that sequence may be incorrect)

6" interbedded and intercalated soft, gray shale and soft, friable and loose red, yellow and brown, fine-grained sandstone

1½" firm, friable, buff, fine-grained, porous, permeable sandstone

9½" firm to hard, gray and red, very silty, sandy shale, the sandy and silty material in streaks of varying amounts

1" interbedded clay and sand, same as first 6"

1' soft, mushy, loose to friable, buff, fine-grained, porous, permeable sand

No abnormal radioactivity

CORE HOLE NO. 7434

Core #1 175-180', Recovered 3':

7" firm, friable, gray, fine-grained, massive, porous, permeable sandstone with a few small, scattered streaks of soft gray clay

1'8" firm, friable, pink to red, fine-grained, porous, permeable sandstone, containing small spots and grains of soft black mineral, possibly carbonaceous; mottled with gray coloration and containing a very slight amount of soft gray clay in small, irregular streaks

9" soft to firm, gray, massive sandstone as above with some pink coloration scattered throughout

No abnormal radioactivity

Core #2 180-185', Recovered 2'7":

1'10" firm, friable, gray, fine-grained, porous, permeable sandstone, containing a few black mineral grains and thin, yellowish-buff clay streaks throughout

9" sandstone as above, grading from the top downward from gray to dark red, with buff, yellow and pink coloration in bands

No abnormal radioactivity

Core #3 185-190', Recovered 2'6":

2" firm, friable, dark red, very fine-grained hematitic sandstone

3" firmly cemented, varicolored, banded red, buff, yellow and gray, coarse-grained to conglomeratic sandstone, containing siliceous white grains, rounded quartz grains, and gray clay pebbles in matrix of clay and ironstone

2" firm, friable, gray and pink, very fine-grained sandstone, containing one hollow oval-shaped lignitic plant fragment ½" in diameter and the length of the core across; pink and gray coloration in bands

1'6" firm, friable, light gray, very fine-grained micaceous sandstone with thin streaks of red coloration

5" soft, gray, yellow, buff and red sandy clay intercalated with soft, loose, red, yellow and buff fine-grained sand

No abnormal radioactivity

CORE HOLE NO. 7434 - continued

Core #4 190-195', Recovered 2'5":

6" firm, yellow, buff and pink, very fine-grained, slightly macaceous sandstone, containing black mineral grains in streaks, red hematitic specks and white siliceous specks in a few places; some flat, gray clay specks

6" hard, dense, gray, sandy shale with elongated streaks of black carbonaceous or lignitic material (plant remains) in the top 2 inches

2" soft, gray and red-streaked, sandy shale

9" hard, gray, slightly silty shale with spots of red shale in the bottom 1 inch

6" soft, gray shale intercalated with soft, loose red, yellow and buff, very fine-grained sandstone

No abnormal radioactivity

Core #5 195-200', Recovered 1':

1' soft, loose to very friable, gray, very fine-grained sand with black (iron oxide?) grains in a few thin streaks

No abnormal radioactivity. Drilled uniformly fast

Core #6 200-205', Recovered 2'11":

6" firm, friable, light gray, fine-grained, porous, permeable sandstone with some white opaque grains and streaks of buff-yellow clay material

6" firm, gray to yellow, coarse-grained to conglomeratic sandstone, containing large grains of white siliceous material, streaks of soft, yellowish-buff clay and a few thin horizontal streaks of black mineral

11" firm, friable, light gray, fine-grained, porous, permeable, cross-bedded sandstone containing thin streaks of buff-yellow clay material and some pink coloration due to red grains

11" conglomeratic sandstone, same as second 6 inches above, except coarser-grained

1" soft, loose, gray, very fine-grained shaly sandstone

No abnormal radioactivity

CORE HOLE NO. 7434 - continued

Core #7 240-245', Recovered 1'2":

9" firm, friable, buff, yellow and gray, fine-grained to medium-grained sandstone, banded in nearly horizontal streaks by color and grain size; well-sorted to poorly sorted in streaks; contains many opaque white grains

5" loose to firm, friable, red, yellow and buff conglomerate with many black and white (predominantly black) opaque grains and small, subround pebbles up to 3/10ths inch in diameter in a clay matrix; poorly sorted

Core #8 245-249½', Recovered 9":

First 8 inches of coring was fast, remainder cored very slow and hard; would not core past 249½'

1" firm to hard, tightly cemented conglomerate consisting mainly of dark gray chert pebbles averaging less than 1/10th inch in diameter, cemented with light gray to white cementing material; small pyrite crystals scattered throughout

8" sticky, hard, dark gray and olive-drab shale with minute pyrite crystals scattered thinly throughout

No abnormal radioactivity

TOP MORRISON - 246'

CORE HOLE NO. 7461

Core #1 175-180', Recovered 1':

1' firm, friable, gray, very fine-grained, micaceous, impermeable sandstone with thin horizontal partings of black carbonaceous material in streaks throughout; poor porosity

No abnormal radioactivity

Core #2 180-183', Recovered 1':

6" soft, sticky, gray clay
6" soft, gray, very fine-grained, shaly, impermeable sandstone with thin horizontal laminations of soft clay and a few horizontal partings of black carbonaceous shale

No abnormal radioactivity

Core #3 183-186', Recovered 2'8":

2'8" firm, friable, dark gray, very fine-grained, shaly, massive sandstone; a few scattered small streaks of pyrite; soft, dull black radioactive material in bands, interbedded and in infrequent thin streaks 1 inch or less in thickness, beginning 6 inches from the top down to the bottom 8 inches; in bottom 8 inches, in horizontal streaks in abundance

Core #4 186-189', Recovered 7":

7" firm, friable, dark gray, fine-grained, porous, permeable sandstone; weakly radioactive throughout, good radioactivity in bottom 1 inch; radioactive material is soft, dull black and intermixed as cementing material in the sandstone

Core #5 189-191', Recovered 8":

8" firm, friable, dark gray, fine-grained to medium-grained, cross-bedded sandstone with the finer and coarser material sorted in bands at angle to horizontal; weakly radioactive throughout with radioactive material the same as in the cores above in appearance and occurrence; top 1" is black and has good radioactivity; contains some

Core #5 - continued: large grains of white, soft, clay material and white, hard, siliceous material; bottom 4 inches contains two elongated spots of soft, dull, black, radioactive material, carbonaceous in appearance

Core cut very fast with little weight

Core #6 191-194', Recovered 1'3":

1" soft, friable, dark gray, fine-grained to coarse-grained and conglomeratic sandstone, containing flattened, dark gray, clay pebbles and pebbles of white siliceous clay mineral; banded in horizontal layers; contains soft black carbonaceous material in fragments

6" soft, dark gray, fine-grained, porous, permeable, well-sorted sandstone, broken to small fragments and "mush" in core barrel; contains abundance of soft black, pyritic, carbonaceous, lignitic, "woody"-textured material

8" firm, dark gray, well-sorted, massive, fine-grained sandstone; no carbonaceous material as above

No abnormal radioactivity

Core #7 194-197', Recovered 2'9":

2'9": firm, dark gray, fine-grained, slightly shaly, massive sandstone, containing small pellets of soft, sticky, dark gray clay throughout, becoming larger in size in bottom 4 inches; small, elongated, flat, dark brown and black carbonaceous plant fragments in scattered horizontal streaks

No abnormal radioactivity

Core #8 197-200', Recovered 1'10":

2" firm, gray, fine-grained sandstone, containing pellets of soft, light gray clay up to pebble size

1'8" soft, loose to friable, gray, very fine-grained sand with occasional thin laminations of soft, dark gray shale less than ¼ inch in diameter

No abnormal radioactivity

Core #9 210-213', Recovered 1'10":

1'10" firm, friable, gray, fine-grained, porous, permeable, well-sorted, pyritic sandstone; pyrite in very small crystals or grains

No abnormal radioactivity

Core #10 213-216', Recovered 2':

2' soft to loose, gray, very fine-grained, shaly sandstone with thin laminations of soft, dark gray clay; core jammed and broken in core barrel

No abnormal radioactivity

Core #11 216-220', Recovered 1'10":

1" sandstone as in core above
1'9" firm to hard, varicolored gray, yellow, buff and red, fine-grained sandstone with hematitic and limonitic material in grains, as cementation, and irregularly disseminated through core

No abnormal radioactivity

Core #12 275-280', Recovered 3": (Core catcher damaged)

3" firm, friable, banded and stratified, red, yellow, buff and pink, fine-grained to medium-grained sandstone with many opaque white, buff and red grains elongated along bedding planes; hematitic cementation in part

No abnormal radioactivity

Core #13 280-28¾', Recovered 2'2":

1" sandstone as in core above
2'1" firm, sticky, dark, slightly brownish-gray shale

No abnormal radioactivity

TOP MORRISON - 281'

CORE HOLE NO. 7462

Core #1 175-180', Recovered 4½':

4'6" firm, gray, fine-grained, slightly shaly sandstone with brown and black carbonaceous material in fine fragments and thin horizontal streaks; occasional small spots of soft, gray clay; becomes coarser-grained from top to bottom

No abnormal radioactivity

Core #2 180-185', Recovered 4'2": (Recovery estimated, core jammed and broken in core barrel)

1'1" soft to loose, dark gray, fine-grained sand with thin laminations of brown and black carbonaceous material and weak to fair radioactivity; radioactive mineral irregularly scattered and not exclusively associated with the carbonaceous material

2' soft to loose, gray, fine-grained sand with occasional laminations of dark brown and black carbonaceous material and a few irregular spots of yellowish-buff sand; no visible mineralization; weak radioactivity near middle of 2 feet

1'1" firm to soft, light gray, fine-grained, porous, permeable, massive sandstone with coarser grains than portion of core described above; no visible mineralization or carbonaceous material; no abnormal radioactivity

Core #3 185-190', Recovered 2'11:

2'11" firm to soft, gray, fine-grained, massive, porous, permeable sandstone, containing many buff and white opaque grains and several conglomeratic streaks of soft, white clay material in small pebbles; one small piece of soft black radioactive cementing material 1'4" from the top, no abnormal radioactivity in the other part of the core

Core #4 190-194'8", Recovered 4':

9" firm, friable, gray, fine-grained, porous, and permeable sandstone, containing many buff and yellow opaque grains, becoming coarser-grained toward the bottom

Core #4 - continued:

11" friable, yellowish-buff and gray, fine-grained to medium-grained, porous, permeable sandstone, containing many yellow and white opaque grains and several streaks of soft, black radioactive mineral less than 1/10th inch thick; very weak radioactivity over-all

1'1" firm, yellow and white, clay-pebble conglomerate, consisting predominantly of white, soft to hard, clay pebbles in a matrix of yellow sandy clay; contains some rounded gray chert pebbles 2/10ths inch or less in diameter; one 1-inch thick streak of friable, gray and yellow, coarse-grained, porous, permeable sandstone with a thin streak of black, pyritic, carbonaceous material

9" firm, gray, coarse-grained sandstone with many white opaque grains, becoming coarser from top to bottom; fair radioactivity in thin streaks; very weak radioactivity over-all

6" firm, gray, conglomeratic sandstone, increasing in coarseness from top to bottom and containing flat, white grains and pebbles at the top and rounded, gray and dark gray siliceous pebbles toward bottom; a small amount of black, pyritic, carbonaceous material with fair radioactivity; very weak radioactivity over-all

Core #5 194'8" - 200', Recovered 5'4":

5'4" firm, gray, fine-grained, porous, permeable, well-sorted, massive, "clean" sandstone; no visible mineralization; questionable, very weak radioactivity in a few spots

Core #6 200-210', Recovered 9':

9' firm, gray and buff, fine-grained, porous, permeable, massive, well-sorted, "clean" sandstone with a few soft, gray clay pellets through an interval 4' to 5' from the top; some soft, opaque, yellowish-buff grains scattered throughout; no visible carbonaceous material or mineralization; no abnormal radioactivity

Core #7 210-215', Recovered 2½':

1'	firm, friable, gray, fine-grained sandstone with spots and streaks of pink and light gray coloration and small specks and balls of soft, light gray clay; vertical fractures
1'6"	firm, buff to gray, fine-grained, well-sorted, massive sandstone, containing buff opaque grains; no visible mineralization

No abnormal radioactivity

Core #8 215-220', Recovered 3'4":

3'4"	firm, buff and gray, fine-grained shaly sandstone, containing an abundance of large and small, irregular, rounded masses of soft, gray clay; abundance of yellowish-buff opaque grains; red hematitic mineralization surrounding clay masses; no abnormal radioactivity

CORE HOLE NO. 7463

Core #1 175-180', Recovered 3'5":

3'5" firm to soft, partially friable, gray, very fine-grained, massive, shaly sandstone with thin streaks and irregular spots of gray shale; black and dark brown carbonaceous material in small individual fragments and thin streaks scattered irregularly throughout; the softer portions in streaks 1 to 2 inches thick

No abnormal radioactivity

Core #2 180-185', Recovered 4'3":

1' firm to soft, partially friable, gray, fine-grained, porous, permeable, well-sorted sandstone

6" firm, gray, fine-grained, well-sorted sandstone as above, with small, irregular, nearly horizontal streaks of black and dark brown carbonaceous material

1'4" sandstone as above, with increase in amount of carbonaceous material; weakly radioactive in streaks, radioactive material apparently part of or associated with the black carbonaceous material

1'5" sandstone as above, becoming darker in color and stronger in radioactivity; carbonaceous material pyritic and "woody"-textured; the more radioactive portions of the core are darker gray in color and not exclusively associated with the carbonaceous material; shaly appearance; good radioactivity in the bottom 2 inches

Core #3 185-190', Recovered 2'3":

2" firm, gray, fine to medium-grained, well-sorted sandstone, containing abundance of soft, black, radioactive material as cementation and in horizontal streaks; fair radioactivity

11" firm, gray, fine to medium-grained, well-sorted, porous, permeable sandstone; very weakly radioactive; no visible mineralization

1'2" firm, gray, fine to medium-grained sandstone, containing an abundance of soft, black material in nearly horizontal streaks and as cementation, increasing in amount from top to bottom; fair radioactivity at the top, increasing to good radioactivity at the bottom

CORE HOLE NO. 7463 - continued

Core #4 190-195', Recovered 3'1":

10"	firm, dark gray, fine to medium-grained, well-sorted sandstone with abundant soft, black mineral disseminated evenly throughout as cementation; good radioactivity
7"	firm, gray, fine to medium-grained, well-sorted, porous, permeable sandstone with no visible mineralization; weakly radioactive
6"	firm, light gray, conglomeratic sandstone with large grains and small pebbles of white siliceous material, cemented and laminated with very soft, black, radioactive material; abundant pyrite; good radioactivity
1'2"	firm, light gray, fine-grained, massive, porous, permeable sandstone with a few scattered spots of pyrite; no other visible mineralization; very weak radioactivity in streaks

Core #5 195-200', Recovered 3½':

2'6"	firm, light gray, fine-grained, well-sorted, massive, porous, permeable sandstone with a few scattered spots of pyrite
1'	firm, gray, porous, permeable, broken sandstone with many streaks and spots of soft, black and dark brown, carbonaceous and lignitic material with texture of wood and coal; lignitic material in irregular masses; small spots of pyrite; no abnormal radioactivity

Core #6 200-210', Recovered 1':

1'	sand, as in bottom of core above; no abnormal radioactivity

Core #7 210-215', Recovered 3½':

9"	firm to hard, dense, gray, very shaly siltstone, grading to silty shale toward bottom
1'2"	firm to hard, dense, gray, very silty shale
1'	hard, dense, light greenish-gray, sandy, silty shale with spots of pyrite
7"	hard, dense, light gray, very fine-grained, very shaly sandstone, containing spots of light green shale and scattered

Core #7 - continued

spots of pyrite

No abnormal radioactivity

Core #8 215-220', Recovered 3'8":

1'5"	hard, dense, light gray, very shaly siltstone with streaks of light green, very silty shale irregularly disseminated throughout
2'3"	hard, dense, light gray, very silty shale

No abnormal radioactivity

Core #9 275-279', Recovered 1'5":

5"	hard, dense, tightly cemented, red and white banded, very fine-grained to fine-grained, laminated, hematitic sandstone with hematite in thin, irregular streaks
4"	hard, dense, gray and red, fine-grained sandstone, interbedded with coarse-grained and conglomeratic sandstone consisting mostly of dark gray, rounded chert pebbles with abundant dark red, hematitic material as cementation; a few fragments of dark brown and black lignitic material
2"	hard, dense, dark gray, conglomerate consisting of dark gray chert pebbles 1/10th inch in diameter imbedded in slightly brown, buff, siliceous matrix; lignitic fragments as above
6"	firm, sticky, dark gray, slightly greenish shale

No abnormal radioactivity

TOP MORRISON - 276'

CORE HOLE NO. 7464

Core #1 175-180', Recovered 4'3":

1" hard, dense, gray and brown, very fine-grained, quartzitic, limonitic sandstone

4'2" firm to hard, gray, shaly, very fine-grained sandstone with very thin laminations of soft, gray shale, scattered thinly throughout; contains many dark brown and black carbonaceous partings and fragments in nearly horizontal streaks and bands; one spot of pyrite near middle of core

No abnormal radioactivity

Core #2 180-183', Recovered 2'9":

2'9" firm, light gray, fine-grained, porous, permeable, slightly micaceous sandstone with paper-thin laminations of dark brown and black carbonaceous material in horizontal or nearly horizontal bands ¼ inch or less in thickness; a few pebble-sized balls of soft, light gray clay

No abnormal radioactivity

Core #3 183-186', Recovered 1'10":

1" sandstone, same as core above

3" firm, dense, gray, very fine-grained, very shaly sandstone with thin carbonaceous partings and thin laminations of gray shale

1'6" firm, friable, gray, fine-grained to medium-grained, porous, permeable, cross-bedded sandstone with bands of light gray and dark gray coloration throughout; one streak of soft, pyritic, carbonaceous, "woody"-textured material ¼ inch thick in top 2 inches; a very few thin streaks of carbonaceous material in remainder

No abnormal radioactivity

Core #4 186-189', Recovered 1'4":

1'4" firm, gray, fine-grained to medium-grained, poorly sorted sandstone, shaly in streaks; from top to bottom becomes gradationally coarser-grained; darker, more shaly and lighter, less shaly material present in bands at angle to horizontal, giving core a striped-candy appearance; one streak soft, black "woody," carbonaceous material 2 inches from bottom;

Core #4 - continued: pyritic in spots.

Core cut uniformly soft. No abnormal radioactivity.

Core #5 189-192', Recovered 1'2":

1"	firm, friable, gray, coarse-grained, poorly sorted, shaly sandstone with spots of soft, black, pyritic, carbonaceous material
1'1"	firm to soft, friable, interbedded and intercalated, gray, shaly coarse-grained sandstone and conglomerate, pebbles not exceeding 2/10ths inch in diameter; contains spots of soft, black, carbonaceous, pyritic material; pebbles are predominantly white, gray and light gray, subround; becomes gradationally coarser from top to bottom; shaly in streaks and finer and coarser in thin layers and streaks

No abnormal radioactivity

Core #6 192-195', Recovered 1'9":

6"	soft, gray, shaly, fine-grained to coarse-grained and conglomeratic banded and layered sandstone with thin laminations of black, pyritic, carbonaceous material; many pebbles and rounded balls of soft, dark gray and light gray clay; some pebbles as in conglomerate in core above
1'3"	firm to hard, tightly cemented, gray, very shaly, very fine-grained sandstone, grading to siltstone with numerous irregular streaks and rounded inclusions of soft, dark gray shale and hard, dark gray, sandy shale

No abnormal radioactivity

Core #7 195-200', Recovered 2'6":

6"	soft, gray, very fine-grained to fine-grained, very shaly sand with many streaks and rounded inclusions of soft, dark gray clay
2'	firm, partially friable, gray, fine-grained sandstone with numerous paper-thin partings and small fragments of dark brown to black carbonaceous material; slightly shaly in top 2 inches; one ½-inch thick streak of soft, "woody"-textured, pyritic, lignitic material 6 inches from the bottom

No abnormal radioactivity

CORE HOLE NO. 7464 - continued

Core #8 200-210', Recovered 4'8":

4'8" firm, gray, fine-grained, porous, permeable, massive, well-sorted, slightly shaly sandstone, with widely scattered thin laminations of soft, dark gray clay and a few scattered streaks of paper-thin particles of black and dark brown carbonaceous material

No abnormal radioactivity

Core #9 210-213', Recovered 1':

10" soft, "musky", light gray, fine-grained, shaly sandstone, containing rounded balls and irregular masses of soft, gray clay

2" soft, loose gray, shaly, conglomeratic sandstone, fine-grained for the most part, but containing many rounded pebbles of dark gray chert up to 2/10ths inch in diameter. Core jammed and irregularly stuffed in core barrel so that no bedding could be determined.

No abnormal radioactivity

Core #10 213-216', No Recovery

Cored very fast with little weight

Core #11 216-220', Recovered 3':

1' firm, light gray, very fine-grained, shaly, impermeable sandstone, with laminations of gray shale scattered thinly throughout

2' firm, light gray, shaly siltstone, containing many thin laminations of gray shale

No carbonaceous material
No abnormal radioactivity

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

224 New Customhouse
Denver 2, Colorado

September 27, 1955

Memorandum

To: E. O. Binyon

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium), Contract Idm-E870, Shannon Oil Company (Layman Lease), Crook County, Wyoming.

Because of the proximity of several other contracts in Wyoming, the subject contract has been assigned to J. F. Shaw to administer.

Will you please send him, at your earliest convenience, the complete Rapid City office file on the docket, with a copy of your transmittal letter to me. The mailing address for Mr. Shaw is as follows:

John F. Shaw
U. S. Bureau of Mines
Room 137, Building 20
Denver Federal Center
Denver 2, Colorado

W. M. Traver

W. M. Traver

WMT:jy
cc: Sec. Op. Comm. (2)
Shaw (2)
Harshman
Townsend
Corresp. File E870
Chron.

RECEIVED
SEP 30 1955

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

RECEIVED
SEP 26 1955

CERTIFIED MAIL

224 New Customhouse
Denver 2, Colorado

September 22, 1955

Memorandum

To: Chairman of the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium), Contract Idm-E870, Shannon Oil Company (Layman Lease), Crook County, Wyoming

Enclosed are the Government's, Division, and Docket copies of the subject contract as executed by the contractor. The contract copies were transmitted to this office by your letter of September 14, 1955.

The six copies of the Subordination Agreement included with your letter are enclosed also, as Edwin F. Thorn has refused to sign any more papers. The contracts were executed without this agreement, in accordance with your instructions.

Your attention is called to the fact that the contract was signed by R. S. Shannon, Jr., as general partner, designated as such by a Partnership Agreement (two copies enclosed) to sign such documents. This was considered acceptable in this instance, as two of the limited partners are in California and one in Wyoming and it would have required a considerable length of time to circulate the contract copies to all three partners for signatures.

Copies of the contract have been furnished to the Operator, the Region III Finance Office, distributed to the field offices concerned, and a copy retained in our files.

W. M. Traver

W. M. Traver

Enclosures

MF-201
Revised March 24, 1955

RECEIVED
SEP 26 1955

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator SHANNON OIL CO.
Docket No. DMEA- 3762
Contract No. Idm-E
Contract Date

SUBORDINATION AGREEMENT

To the United States of America:

Referring to that certain land in the County of Crook, State of Wyoming, described as follows:1/

The E ½ of the N W ¼ and the W ½ of the N E ¼ of section 27, T. 52 N., R. 66 W., 6th P. M., Crook County, Wyoming.

which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby--

1. Subordinates whatever right, claim, lien or encumbrance the undersigned may have in or against the land to whatever interests, equities, and rights the Government may acquire under the contract (a) with respect to purchased property in or upon the land to the cost of which it has contributed, including the right to dismantle, sever, and remove it from the land; and (b) with respect to a percentage royalty on production from the land and a lien to secure the payment thereof; and

2. Undertakes and agrees (a) neither to commit any act nor assert any claim in conflict with the provisions of this Subordination Agreement; and (b) to give advance notice of this Subordination Agreement to any transferee of the right, claim, lien, or encumbrance hereby subordinated; and

3. Consents to all amendments and assignments of the contract without notice thereof, and agrees that this Subordination Agreement shall extend and apply thereto.

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

(OVER)

Dated this _____ day of SEP 1 4 1955, 195__.

_____ [Seal]

Edwin F. Thorn

_____ [Seal]

_____ [Seal]

I, _____, certify that I am the _____ _____, (Secretary, etc.) of the corporation named herein; that _____ _____ who signed this agreement was then _____ (President or Vice President, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

_____

[Corporate Seal]

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

RECEIVED
SEP 26 1955

Customhouse
2, Colorado

CERTIFIED MAIL

September 19, 1955

annon Oil Company
3 Midland Savings Building
Denver 2, Colorado

ATTENTION: Mr. Pryor

Re: DMEA 3762 (Uranium), Contract Idm-E870
Shannon Oil Company (Layman Lease) Crook
County, Wyoming

Gentlemen:

Enclosed herewith is the "Operator's Copy" of a Long-Form Exploration Project Contract No. Idm-E870, Docket DMEA 3762.

Also enclosed are six copies of Form MF-104 "Operator's Unit Cost and Progress Report." At the completion of the first calendar month of operation and monthly thereafter you are required to submit five copies of the forms to Mr. J. F. Shaw, U. S. Bureau of Mines, Room 137, Building 20, Denver Federal Center, Denver 2, Colorado. The sixth form is for your records.

Please note that the monthly report requires a narrative report which should be accompanied by maps or sketches. The narrative report must be signed by the operator. The monthly report will not be processed for payment unless accompanied by a narrative report. Additional copies of Forms MF-104 and MF-104A will be forwarded to you as required.

For your information and in reply to many questions that have been asked, after Forms MF-104 and MF-104A are received, an engineer will check progress and approve your accounts, after which it will be sent to the Regional Office, Region III, U. S. Bureau of Mines, 224 New Customhouse, Denver 2, Colorado, for auditing and vouchering. If the report is in order, a check will be issured by the Treasury Department for the Government's portion of the costs. If you have any difficulty in completing these forms and the reports, please call on Mr. Shaw or this office for assistance.

matter of your claim for reimbursement of drilling costs, nt to you under the terms of the contract will be on the basis holes completed to the objective, therefore your monthly report de only such holes that are completed.

der the provisions of the contract the unit cost established for n of work under Category (1) for all stages are allowable maximum ts which cannot be exceeded. The actual cost of each item of work Category (1) must be documented in conformance with the instructions next to the last paragraph on the reverse side of Form MF-104. The l cost up to the allowable maximum unit cost established, and as sup- ed by the documentation, will be the basis for reimbursement to you der the terms of the contract.

When Stage I has been completed you should request approval from this office of the work you propose to perform under the next stage. Your request for the work approval must be in sextuplet, complete with a map showing the location of the holes drilled under Stage I, the proposed location of holes to be drilled under Stage II and the results of the work performed under Stage I, including assay returns and any other pertinent data which will be of value to the Government in evaluating the work performed under Stage I. The same applies to Stage III after completion of Stage II should the work continue to these successive stages. You should anticipate a suspension of operations between stages of work to enable the Government geologist and engineer to evaluate the results of the work performed and make their recommendations to this office relative to the additional work you propose.

To eliminate as much delay as possible, if that is of serious consideration, you should expedite forwarding of the results of the work completed and your request for the Government's approval of the additional work you propose.

Field representatives of the Government are not authorized to approve any changes in the work program or contract provisions. Such approval can only be given by the Washington Office, DMEA, or the DMEA Field Team, Region III, which is comprised of E. N. Harshman, U. S. Geological Survey member, and W. M. Traver, U. S. Bureau of Mines member.

No oral statement of any person shall modify or otherwise affect the terms of conditions of this contract.

It is a regulation that reimbursement for the cost of the work accomplished prior to the date of the contract will not be allowed. It is also a requirement and imperative that you notify this office in writing the date work actually commences under the contract, with a copy of your

letter to Mr. Shaw. In this instance, October 31, 1955 has been entered as the date on or before which operations shall commence in accordance with your request.

Yours very truly,

W. M. Traver

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

Enclosures

WMT:jy

cc: Chair. Oper. Comm. (2)
Harshman
Shaw (2)
~~Hesler~~
Townsend
Corresp. E870
Amend. E870
Chron.

Surname copy

700

Murphy
Ellis
Talbert
Selfridge
Kjelmen

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

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

SEP 1 4 1955

Re: Docket No. DMEA-3762 (Uranium)
Shannon Oil Company
E½ NW¼ and W½ NE¼, Sec. 27,
T. 52 N., R. 66 W., 6th P. M.
Crook County, Wyoming

Dear Mr. Traver:

Enclosed are the original and five copies of a long-form contract between the Government and Shannon Oil Company. Also enclosed are six copies of a Subordination Agreement and a self-explanatory memorandum from the Legal Division.

In a telephone conversation between Mr. Pryor and the Washington Office, Mr. Pryor stated that Mr. Thorn, who holds the surface rights, refused to sign any more papers. However, if his signature can be obtained, kindly follow the procedure outlined by Mr. Hafflund's memorandum. If it is impossible to obtain Mr. Thorn's signature, you are authorized to have the contract executed without this agreement.

If you and the Operator find the proposed contract in order, please insert in Article 3 of the contract form the date work shall commence; then have an authorized representative of the company sign the original and all copies. Thereafter kindly distribute the copies in the usual manner.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (JB)

Enclosures

APPROVED:

P. F. Yopes (JB)
Member, Bureau of Mines

/s/ M. E. Nelson (JB)
Member, Geological Survey

FMMurphy/gla
9-9-55
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. JECrawford, Rm. 3641
THKiilsgaard, Rm. 5224
JCHosted, Rm. 3210, GSA
Code 700
Mr. Murphy

R.C.S.

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
WASHINGTON 25, D. C.

Memorandum

To: The Administrator, DMEA
Attention: E. W. Ellis

From: Acting Assistant Solicitor, Defense Minerals

Subject: Docket No. DMEA-3762, Shannon Oil Company, Crook County, Wyoming

As requested in Mr. Murphy's memorandum dated August 23 we have prepared the attached contract.

It should be noted that the applicant's rights in the land depend upon a lease of the mineral rights and a separate lease of the surface. The Consent to Lien of the lessor of the mineral rights is attached, and the contract so recites.

However, the Consent to Lien of the lessor of the surface rights is not attached. We have assumed that the Consent to Lien would be waived as to the surface rights, and the contract so recites. This lease recites that it is subject to a 1½ percent royalty. Perhaps the lessor would execute a Subordination Agreement as to his royalty rights, in lieu of the Consent to Lien. We have drafted such an agreement for your use. If the Subordination Agreement is obtained for the surface, the contract form (Article 2(c) should so recite.

for Henry D. Paulson
J. L. Hofflund
Acting Assistant Solicitor,
Defense Minerals

8/25/55 gla

SHANNON OIL CO.
(A LIMITED PARTNERSHIP)
603 MIDLAND SAVINGS BUILDING
DENVER 2, COLORADO

Aug. 24, 1955

RECEIVED
AUG 25 1955

Defense Minerals Exploration Administration
U.S. Department of the Interior
Washington 25, D. C.

Attention Mr. Murphy

RE: DOCKET NO. DMEA-3762 (URANIUM)
E½NW¼ & W½NE¼, Section 27,
T. 52 N., R. 66 W.
Crook County, Wyoming

Dear Mr. Murphy:

Enclosed find six executed copies of "Consent To Lien" in accordance with our telephone conversation this date.

Very truly yours,

SHANNON OIL CO.

By Glen W. Pryor

GWP-v

Encl. 6

surname 700

Murphy

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

August 23, 1955

Memorandum

To: Acting Assistant Solicitor, IMEA

From: F. M. Murphy, Mining Engineer
Rare and Miscellaneous Metals Division

Subject: Docket No. 3762
Shannon Oil Company
Layman Lease
Crook County, Wyoming

Will you kindly prepare a long-form contract in accordance with the attached draft.

The Applicant advised this office by telephone, August 19, that he would forward the required executed copies of the Owners' Consent to Lien within a few days.

F. M. Murphy

Attachments

FMMurphy:am
cc to: Docket
Code 700
Mr. Murphy

Aug. 24. Mr. Murphy talked with General Manager of Company at Denver, who advises he has Consent to Lien from owner of the mineral rights, but cannot obtain Consent to Lien from owner of surface rights.

Draft
FMuphy:am
8-23-55

Header X

MF-200
(Revised June 1954)

Docket No. DMEA 3762

Commodity Uranium

Contract No. Idm-E

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

EXPLORATION PROJECT CONTRACT[1]

It is agreed this ..... day of ....., 195...., between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and [2] Shannon Oil Co., a limited partnership consisting of R. S. Shannon, Jr., W. J. Quinlin, Kathryn E. Scoville, and Phyllis L. Warnick,

whose mailing address is 603 Midland Savings Bldg.
Denver 2, Colorado,
hereinafter called the "Operator," as follows:

ARTICLE 1. *This contract* is entered into under the authority of the Defense Production Act of 1950, as amended. It consists of this form (MF–200), the attached Exhibit "A," Annex I, and Figure 5

The Operator shall not transfer or assign this contract or any right thereunder without the written consent of the Government.

ARTICLE 2. *Operator's property rights.*—(a) The land which is the subject of this contract (hereinafter called "the land") is in the State of Wyoming, County of Crook, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] Lessee of [5] entire interest in the land, in possession and entitled to possession for all of the purposes of this contract, under and by virtue of a [6] ....., [7] ....recorded in Book ....., page ....., official records of said County; and

(2) The Operator's right, title, or interest (whether as owner, lessee, or otherwise) is subject only to the following claims, liens, or encumbrances: .....

(c) The Subordination Agreement of the holder of any claim, lien, or encumbrance listed above, and (if the Operator does not hold the legal title) the Consent to Lien of any holder of the legal title

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] Insert name, and if an organization, its nature (corporation and place of incorporation, partnership with names of partners, etc.).
[3] State on a separate sheet marked "Annex I" the legal description or enough to identify the property, particularly excluding any areas from which the production is not to be subject to the Government's percentage royalty.
[4] Insert "owner," "lessee," "contract purchaser," "locator," etc.
[5] Insert "the entire interest," "the mineral rights," "an undivided one-third," etc.
[6] Insert "deed," "lease," "contract," "location notice," "patent," etc.
[7] If not recorded, so indicate by inserting "un."

of the land (lessor, seller, optionor, etc.), are attached, as follows: Owners' Consent to Lien
Mineral rights - Surface

(d) The Operator shall preserve and maintain his right, title, and interest in the land and his right to the possession thereof for the purposes of this contract, and shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of this contract. Until the lapse of the time within which the Government may make a certification of discovery or development without any such certification having been made, and after any such certification has been made, the Operator shall neither transfer, convey, nor surrender the land nor any right, title, or interest therein, nor permit nor suffer any claim, lien, or encumbrance thereon, without expressly referring to and providing in the instrument of conveyance, lien, or encumbrance for the preservation of the Government's right to a percentage royalty on production and lien for the payment thereof. If the Government makes no certification of discovery or development within the time limited in Article 8, it shall thereafter have no claim against the land or any production therefrom except for any production referred to in Article 8(b)(1).

ARTICLE 3. *The exploration project.*—The project is a search for indicated or undeveloped deposits of Uranium The work to be performed is described in Exhibit "A." The Operator on or before shall commence the work, and on or before September 1, 1956 (unless the Operator's obligation to prosecute the work is terminated—see Article 10) shall either have completed the work or shall have incurred allowable costs (see Article 6) in a sum not less than the estimated total allowable cost set forth in Exhibit "A."

ARTICLE 4. *Performance of the work.*—(a) *Operator's responsibility.*—The work shall be performed with reasonable diligence, efficiently, expertly, in a workmanlike manner, in accordance with good mining standards and State regulations for health and safety and for liability insurance covering employment; and with suitable and adequate equipment, facilities, materials, supplies, and labor, to bring it to completion within the time fixed.

(b) *Independent contracts.*—To the extent that the allowable costs are estimated in Exhibit "A" with express reference to performance by independent contractors on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations), the work may be so performed; but if the reference in Exhibit "A" to any such independent contract requires the Government's approval thereof, payments under such contract will not be allowable costs unless the Government gives its written approval of the contract. Any such independent contract shall refer to some specific and identifiable part of the work, and shall be subject to all of the pertinent terms and conditions of this exploration contract; but the Government shall not be considered a party thereto, and its rights under this contract, including the right to terminate its contributions, shall not be affected thereby. Regardless of the provisions of any such independent contract and regardless of the Government's approval thereof, the Government will participate in payments to the independent contractor only on account of work performed in accordance with the provisions of this exploration project contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable.

(c) *Government may inspect.*—The Operator shall consult with and inform the Government on all phases of the work as it progresses. The Government may enter at all reasonable times to inspect the work under the contract, and also after a certification of discovery or development to inspect production operations and underground workings. The operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 5. *Contribution by the Government.*—The estimated total allowable cost of the project, set forth in Exhibit "A," is the sum of $ ~~59,036.00~~ 59,360.00
The Government shall contribute 75 percent of the allowable costs as they are incurred in a total sum not in excess of $ ~~44,277.00~~ 44,520 : *Provided,* That until the Operator has rendered to the Government his final report, and any final auditing required by the Government has been made, and a final settlement of the contract has been made, the Government may withhold from the last

voucher or vouchers such sums as it sees fit not in excess of 10 percent of the estimated total cost of the work or not in excess of the amount of the Government's contribution to the cost of property which is or may become subject to disposal as provided in Article 9(c), whichever is greater. The Government will make its contribution on the basis of the monthly vouchers referred to in Article 7(b), but all payments by the Government are provisional only, subject to audit, until the account between the Operator and the Government is finally audited and settled. "Costs incurred" mean costs that have been paid or have become due and payable, or that in the opinion of the Government have become an obligation. The Government may make payments directly to independent contractors and suppliers for the account of the Operator rather than to the Operator.

ARTICLE 6. *Estimated costs.*—(a) *Categories of costs.*—The allowable costs of the work to which the Government shall contribute are limited to those that are direct, reasonable, necessary, and that are estimated in Exhibit "A" by categories as specified in this article. If any category or subcategory is omitted from the estimate of costs, or if the word "none" is annexed to the listing thereof, costs under such category or subcategory are not allowable. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost, and any excess over the estimated total allowable cost of the work, shall not be allowable. Any excess over the estimate of any category, subcategory, or item, either as to requirement or related cost, not indicated as a maximum shall be allowable within the limit of the estimated total allowable cost of the work. To the extent that excesses over maximums other than the estimated total allowable cost of the work may be necessary for the performance of the work, the Operator shall incur such excesses for his own account without contribution by the Government; but except for any such necessary excesses in categories, subcategories, or items thereunder the Operator is not obligated to incur more than his agreed percentage of the estimated, total allowable cost of the work.

To the extent specified in this article or in Exhibit "A" the following categories, subcategories, and elements thereof are maximums; but if not so specified either here or in Exhibit "A" they are not maximums, and may be exceeded within the limit of the estimated total allowable cost of the work:

CATEGORY (1)—INDEPENDENT CONTRACTS.—Work to be performed under independent contracts (see Article 4(b)). The estimated total amount of this category and the estimated cost of each unit of work for performance under an independent contract are maximums.

CATEGORY (2)—PERSONAL SERVICES.

Subcategory (a)—Supervision.—All elements of this subcategory (number of supervisors, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)—Technical services.—All elements of this subcategory (number of technicians, periods of employment, rates of pay, and total) are maximums.

Subcategory (c)—Labor.

CATEGORY (3)—OPERATING MATERIALS AND SUPPLIES.—Includes such items as drill bits and steel, explosives, fuel, pipe, power, small tools costing less than $50 each, timber, track.

CATEGORY (4)—OPERATING EQUIPMENT.

Subcategory (a)—Rental.—The number of each object to be rented [6 mine cars, 1 truck], the rate of rental [$100 per month, $5 per hour], and the total of this subcategory are maximums.

Subcategory (b)—Purchases.—The estimated total of this subcategory is a maximum.

Subcategory (c)—Depreciation.—All elements of this subcategory (time periods, rate of depreciation, and subcategory total) are maximums.

CATEGORY (5)—INITIAL REHABILITATION AND REPAIRS.—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

Subcategory (a)—Initial rehabilitation and repairs of existing buildings, fixtures, and installations (exclusive of mine workings).—The estimated total of this subcategory is a maximum.

Subcategory (b)—Initial rehabilitation and repairs of operating equipment.—The estimated total of this subcategory is a maximum.

CATEGORY (6)—NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

CATEGORY (7)—MISCELLANEOUS.—Repairs and maintenance (other than initial) of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, communications, and any other items of requirement or cost that do not fall within any of the first 6 categories.

THE ESTIMATED TOTAL ALLOWABLE COST of the work is a maximum.

(b) *Nonallowable costs.*—The following costs are not allowable for contribution by the Government:

(1) *Costs of the land,* such as rental, depreciation, depletion, or other cost of acquiring, owning, or holding possession;

(2) *Indirect costs,* such as general overhead, corporate management, interest, taxes (other than payroll and sales taxes), insurance (other than liability insurance covering employment), damages to persons, damages to property (other than necessary repairs or replacements of equipment or other property used in the work);

(3) *Previous work* performed or costs incurred before the date of this contract; and

(4) *Deferred payments.*—Any costs incurred by the Operator under any rental-purchase agreement, installment-purchase agreement, or any agreement for the purchase of goods under the provisions of which payment of the full purchase price is deferred more than 90 days from the delivery of the goods; unless the purchase agreement is approved by the Government in writing.

(c) *Reductions in costs.*—The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original estimated total cost. This provision does not apply to receipts from production which are subject to the Government's percentage royalty under the provisions of Article 9.

ARTICLE 7. *Reports, accounts, audits.*—(a) *Operator's records.*—The Operator shall keep suitable records and accounts of the work performed and of any production in which the Government may have an interest; and shall preserve those with respect to work performed for at least three years after final payment by the Government, and those with respect to production for at least three years after any obligation to pay royalties to the Government has terminated. The Government may inspect and audit said records and accounts at any time, either by itself or by a certified public accountant. If the Government elects to audit said records and accounts relating to the exploration work by certified public accountant, it may do so as a cost of the work to which the Operator shall contribute. The Comptroller General of the United States or his representative, until the expiration of said three-year periods, shall have access to and the right to examine any pertinent books, documents, papers, and records of the Operator. All of the Operator's vouchers and records and accounts relating thereto and the Government's payments thereof remain subject to adjustment until final audit by the Government. If work under this contract is carried on in conjunction with any other operations, or if labor, supervision, services, materials, supplies, equipment, facilities, or other requirements for carrying on the work are also used in connection with other operations, the costs shall be segregated and accounted for on a basis and by methods and accounts that are satisfactory to and approved by the Government.

(b) *Progress reports and vouchers.*—The Operator shall provide the Government with five copies of monthly progress reports in three sections as follows: (1) Operator's Monthly Report and Voucher showing detailed costs incurred during the reporting period; (2) Operator's Unit Cost and Progress Report showing the various types of work performed during the reporting period and costs incurred for each type of work; and (3) a Narrative Report of the work performed during the reporting period including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground. (Forms for reporting under (1) and (2) above will be provided by the Government.)

(c) *Final report.*—Upon completion of the work or termination of the Government's obligation to contribute to costs, the Operator shall furnish the Government with five copies of a final report (in addition to the final progress report and voucher). This final report shall include a geological and engineering evaluation of the results of the work performed under the contract with an estimate of the ore reserves resulting from such work, complete assay data, adequate geological and engineering maps or sketches, and a summary of the work performed and related costs incurred.

(d) *Report of sales.*—The Operator shall provide the Government with suitable accounting and documentary evidence covering all production to which the Government's percentage royalty relates, such as copies of smelter or concentrator settlement sheets, and certified accounts of production and sale or other disposition of production.

(e) *Compliance with requirements.*—If in the opinion of the Government any of the Operator's reports, records, or accounts are insufficient or incomplete, or if the Operator fails to make them, the Government may procure the making or completion of such with suitable attachments as an expense of the work to which the Operator shall contribute. The Government may withhold approval and payment of any vouchers relating to insufficient or incomplete reports, records, or accounts.

ARTICLE 8. *Repayment by Operator.*—(a) *Certification.*—If the Government considers that a discovery or development from which production may be made has resulted from the work, the Government, at any time not later than six months after a sufficient final report and final account (see Article 7) has been rendered, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

(b) *Royalty on production.*—The Operator, as principal if the Operator is the producer, or as surety if the Operator is not the producer, shall pay to the Government a royalty on all minerals mined or produced from the land, as follows: (1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first; or (2) if the Government makes a certification of discovery or development, within a period of ten years from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first.

(c) *Basis for computation.*—The Government's royalty shall be a percentage of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrates, metal, or equivalent), at the point of delivery (the f. o. b. point); *except,* that charges of *the buyer* arising in the regular course of business, and shown as deductions on the buyer's settlement sheets, on account of the cost of treatment processes performed by *the buyer,* sampling and assaying to determine the value of the production sold, and freight paid by *the buyer* to a carrier (not the Operator), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. Any costs of treatment processes, sampling or assaying, or transportation, performed or paid by the Operator or by anyone other than the buyer, are not deductible in arriving at the "gross proceeds" as that term is here used. The term "treatment processes," as here used, means those processes (such as milling, concentrating, smelting, refining, or equivalent) applied to the crude ore or other production after it is extracted from the ground, to put it into a commercially marketable form; excluding fabricating or manufacturing.

(d) *Unsold production.*—If any production (ore, concentrates, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used by the Operator in integrated manufacturing or fabricating operations (for instance, if it is stockpiled), the Government, at its option, as long as it so remains, may require the computation and payment of its royalty on the value of such production in the form (ore, concentrates, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used by the Operator in integrated manufacturing or fabricating operations before the Government makes its election, the Government's royalty on such production shall be computed on the value therof in the form in which and at the time when it is so used. "Value" as here used means what is or would be gross income from mining operations for percentage depletion purposes in Federal income tax determination, or the market value, whichever is greater.

(e) *Percentages of royalty.*—The percentages of the Government's royalty shall be as follows:

One and one-half (1½) percent of amounts ("gross proceeds" or "value") not in excess of eight dollars ($8.00) per ton of production in the form in which sold, held, or used, plus one-half (½)

percent for each additional full fifty cents ($0.50) by which such amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such amounts.

(For instance: the royalty on an amount of five dollars ($5.00) per ton would be one and one-half (1½) percent; on an amount of ten dollars ($10.00) per ton, three and one-half (3½) percent.)

(f) *Time for computation and payment.*—The Government's royalty shall be computed and paid currently upon each lot sold, held, or used in integrated operations, as the case may be, as above provided in this article.

(g) *Lien for payment.*—To secure the payment of its percentage royalty, there is hereby granted to the Government a lien upon the land or the Operator's interest in the land and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(h) *Notice to purchasers.*—The Operator shall give notice of the Government's claim for royalty to any purchaser of the production, and shall authorize and direct such purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets. If the records of any production and sales or other disposition of production, whether the production is by the Operator or by others, are not made available to the Government, the amount of the royalty may be estimated by the Administrator, Defense Minerals Exploration Administration, or his successor, and his estimate thereof shall be final and binding upon the Operator.

(i) *No obligation to produce.*—Nothing in this contract is to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

(j) *Government not obligated to buy.*—Nothing in this contract shall be construed as imposing any obligation on the Government to purchase any minerals mined or produced from the land.

ARTICLE 9. *Interests in purchased property.*—(a) *Title and ownership.*—All costs under this contract shall be incurred by the Operator in the Operator's own name and for the Operator's own account; but any property acquired to the cost of which the Government contributes shall belong to the Operator and the Government jointly in proportion to their respective contributions, although title thereto shall be taken in the name of the Operator.

(b) *Preservation of property.*—Until the final disposal of any property in which the Government has an interest the Operator shall preserve and protect same for the best interest of the Government, any reasonable and necessary costs thereof to be treated as an allowable cost of the project. After the completion of the work or termination of the Government's obligation to contribute, or when such property is not in use for or needed for the work, the Operator shall neither use it without the written consent of the Government nor without paying a reasonable rental to be fixed by the Government for its interest.

(c) *Disposal of property.*—Upon the completion of the work or termination of the Government's obligation to contribute to costs, or when the property is no longer needed for the work, the Operator shall promptly dispose of salable or salvageable property in which the Government has an interest for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator or the Government at a price at least as high as could be obtained from others, unless the Government in writing waives its interest in any such property. Without advance approval of the sales price by the Government the Operator shall not sell at any price any item of property the cost of which was more than $500, and shall not sell at less than 25 percent of the purchase price any item of property which cost $500 or less. The Government, in lieu of approving the sales price for any such item, may itself purchase the item at the best price which the Operator is able to obtain or himself cares to give. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, or explosives, or pipe, or rails), and if the original cost of the remaining unexpended portion of any such group or category is less than $50, the Government waives its interest therein. If necessary to accomplish the disposal of any item the Operator shall dismantle and sever it from the land, the cost thereof to be treated as a cost of the project.

(d) *Default of the Operator re disposal.*—If within 90 days after the completion of the work or termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, or after such further time as the Government may in writing allow, the Operator has failed to sell or otherwise liquidate or dispose of any property in which the Government has an interest, the Government, at any time prior to final settlement under the contract, may pursue one of the following two courses: (1) the Government, by written notice to the Operator, may place upon such property what in its opinion is a fair valuation thereof, not in excess of the cost less 1.66 percent per month from the

date such property was purchased under this contract to the termination of said 90-day period; and such property shall thereupon be considered and accounted for as having been purchased by the Operator at the valuation so fixed by the Government; or (2) the Government may enter and take possession of such property wherever it may be found, and remove and dispose of it for the joint account of the parties.

ARTICLE 10. *Termination of the Government's obligations.*—(a) If in the opinion of the Government operations at any time have failed to achieve anticipated results that indicate the probability of making a worthwhile discovery, and in the opinion of the Government further operations are not justified, the Government may give the Operator written notice thereof, and thereupon: (1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting.

(b) If in the opinion of the Government the Operator is in any manner in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon: (1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting. The remedy provided for the Government in this paragraph "(b)" is in addition to any other remedy provided in this contract, and in addition to any other remedy the law may provide for breach of contract.

(c) The giving of any notice by the Government under the provisions of this Article 10 shall not affect the Government's rights as provided for in the contract with respect to a percentage royalty, and such rights shall be fully preserved.

ARTICLE 11. *Notices to be given by the Government* may be delivered to the Operator, or may be sent by registered mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 12. *Officials not to benefit.*—No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 13. *Changes and added provisions.*—

DRAFT
FMURPHY:am
8-23-55

EXPLORATION PROJECT CONTRACT

SHAMNON OIL COMPANY

DOCKET NO. IMEA-3762

ANNEX I

The land referred to in Article 2 of the contract from consists of 160 acres, more or less, situated as follows:

The E ½ of the N W ¼ and the W ½ of the N E ¼ of section 27, T. 52N., R. 66W., 6th P. M., Crook County, Wyoming.

EXPLORATION PROJECT CONTRACT

SHANNON OIL COMPANY

DOCKET NO. IMEA-3762

EXHIBIT "A"

Description of the Work

The object of this project is to explore both the upper and the basal uranium-bearing units of the Cretaceous LaKota Sandstone formation by means of drilling. It is estimated that drill holes averaging 230 feet in depth will be required to penetrate the upper ore-bearing unit and holes 270 feet in depth to explore the basal unit.

The work shall be performed in three successive stages. The Operator shall perform all the work under Stage I and shall perform so much of each succeeding stage as is approved in advance in writing by the Government, based upon the results of the completed stage or stages of work.

STAGE I

Stage I shall consist of bulldozing access roads and preparing eighteen (18) drill sites. Four offset holes shall be drilled at points approximately 50 feet northeast, southeast, northwest, and southwest of each of the AEC drill holes nos. 708, 735, 743, and 746 respectively. Two of each of these groups of four offset holes shall be drilled through the upper ore-bearing unit of the LaKota formation only, the other two shall be drilled to penetrate through both the upper and the basal ore-bearing units. Two holes shall be drilled through the basal LaKota unit at locations approximately 50 feet northeast and southeast of AEC drill hole no. 704. The approximate

locations of Stage I drill holes and the Atomic Energy Commission's drill holes are shown on attached map entitled "Fig. 5 SHANNON OIL CO. LEASE, Layman Property, Crook Co., Wyo., Docket 3762."

It is estimated that 3,600 feet of non-core and 940 feet of core drilling will be required to complete the 18 holes authorized for Stage I. However, if the drill footage estimated for Stage I drilling is not sufficient to complete the eighteen (18) holes, then with previous written Government approval, a part of the footage authorized for Stage II may be used to complete the Stage I drilling.

Under this Stage I of the contract, not in excess of 16 hours of bulldozing shall be performed and not in excess of 90 samples shall be chemically analyzed to determine their U_3O_8 and V_2O_5 content.

STAGE II

Stage II shall consist of bulldozing access roads and preparing forty-two (42) drill sites. The approximate locations of the drill holes for this stage are shown on the attached map, "Fig. 5 SHANNON OIL CO. LEASE, Layman Property, Crook Co., Wyo., Docket 3762."

No hole drilled under this Stage II of the contract shall be closer than 100 feet to any other drill hole. Also, no hole shall be started unless sufficient footage remains in the 8,400 feet of non-core and 2,060 feet of core-crilling provided for this contract stage to complete such a hole through the ore-bearing unit or units to be explored, or unless the Operator agrees in writing that the remainder of the hole shall be completed at the Company's expense.

Under this Stage II not in excess of 42 holes shall be drilled, 22 of the holes shall be drilled to penetrate only the upper ore-bearing unit of the LaKota formation and 20 of the holes shall penetrate both the upper and basal ore-bearing units.

Also, under this Stage II of the contract not in excess of 8 hours of bulldozing shall be performed and not in excess of 210 samples shall be chemically analyzed for their U_3O_8 and V_2O_5 content.

STAGE III

Stage III shall consist of drilling not in excess of twenty (20) holes, aggregating 4,000 feet of non-core and 1,400 feet of core drilling, to further deliniate ore-bearing structures discovered in the preceding stages. No hole drilled under this stage shall be closer than 50 feet or farther than 125 from any other drill hole.

Under this Stage III of the contract not in excess of 100 samples shall be chemically analyzed for their U_3O_8 and V_2O_5 content.

GENERAL PROVISIONS

INSERT → see page-5

GENERAL

Government will approve locations of holes to pen-basal unit.

ESTIMATED COSTS OF THE PROJECT

Actual Costs

Category (1) Independent Contracts

Stage I 18, ~~minimum BX~~ 17X size drill holes or larger

1)	Access roads and drill sites D-6 bulldozer or equivalent 16 hours @ $12.50/hr.	$200.00
2)	Non-core drilling 3,600 feet @ $1.75/ft.	6,300.00
3)	Core drilling 940 feet @ $3.50/ft.	3920.00
4)	Radiometric logging 4,460 feet @ $0.10/ft.	446.00
		$10,236.00

Stage II - 42, ~~minimum BX~~ AX size drill holes or larger

1) Access roads and drill sites D6 bulldozer or equivalent 8 hrs. @ $12.50/hr.	$100.00	
2) Non-core drilling 8,400 feet @ $1.75/ft.	14,700.00	
3) Core drilling 2060 feet @ $3.50/ft.	7,210.00	
4) Radiometric logging 10,460 feet @ $0.10/ft.	1,046.00	$23,056.00

Stage III - 20, ~~minimum BX~~ AX size drill holes or larger

1) Non-core drilling 4,000 feet @ $1.75/ft.	$7,000.00	
2) Core drilling 1,400 feet @ $3.50/ft.	4,900.00	
3) Radiometric logging 5,400 feet @ $0.10/ft.	540.00	$12,440.00

FIXED UNIT COSTS 1/

(Includes all stages)

1) Incidental allowance 2/ for each foot of drilling completed 20,[illegible] feet @ $0.57/ft	$11,628.00	
2) Chemical analyses for U_3O_8 and V_2O_5 - 400 samples @ $5.00/each	2,000.00	$13,628.00

Total Estimated Cost of the Project $59,360.00

Government Participation @ 75 percent $44,520.00

Dorhat

General Provisions

1) A supervisor and one helper shall be employed full time under this contract. The Operator shall also provide any additional aid necessary to the satisfactory technical progress of this project.

2) All holes shall be logged and probed for radioactivity. Records of such logging and probing, together with assay certificates shall be submitted with the Operator's' monthly progress report.

3) The Government shall not contribute to the cost of any uncompleted hole or any hole that bottoms less than Ax core size, nor to the cost of any hole which cannot be probed with radiometric logging equipment.

4) No hole under this contract shall be drilled closer than 100 feet to the outer boundaries of the land described in Annex I.

5) Mineralized portions of the core shall be split, the Operator using one-half for assay purposes. The other half shall be stored for Government use with the rest of the core in boxes properly labeled as to drill hole number. Markers shall be placed in the sections of the core to indicate the depth represented. ~~All drill cuttings shall be properly identified and retained for Government inspection and disposal, unless otherwise notified verbally or in writing by the Government's representatives.~~

6) The supervision, the extent and method of sampling, ~~the manner of storing drill hole cuttings~~, the manner of splitting and storing drill hole cores, the laboratory making the chemical analyses, the location of drill sites and drill holes, and the drilling method used are all subject to Government approval.

8/22/55 gla

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

224 New Customhouse
Denver, Colorado

August 18, 1955

Memorandum

To: W. S. Martin, Acting Chairman, Operating Committee, DMEA, Washington

From: Executive Officer, DMEA Field Team, Region III

Subject: DMEA 3762 (Uranium), Shannon Oil Company, (Layman Lease), Crook County, Wyoming

In response to your letter of August 5, 1955 on the subject loan application and various telephone communications that Mr. Murphy has had with the applicant's representative, Mr. Pryor, we are transmitting under separate cover nine copies of a map, Figure 5, showing approximate locations of the core drill holes proposed in Stage I and Stage II. This is in accordance with the fourth paragraph of your letter.

It is our understanding that in preparing a contract you propose only two holes offsetting D. H. 704 on the west and that the two holes originally programmed for offsetting that hole on the east plus one additional offset hole will be drilled as offsets to D. H. 735 where we suggested only one offset hole.

All the Stage I offset holes on 50-foot centers will be on diagonal lines except those offsetting D. H. 708 where they will be on NS-EW lines.

With the Stage II holes on an interval of 125 feet some of them may be as close as about 93 feet to Stage I holes, but that has been considered and is acceptable to your office.

Mr. Pryor states the required "Owner's Consent to Lien" forms will be sent direct to your office.

We believe this fulfills your indicated requirements for further processing the application to contract.

W. M. Traver

W. M. Traver

RECEIVED

Costs. 8 months

16000' Non Core
4320 Core

Stage I

18 offset holes @ 50'

Non-core — 3600' @ $1.75

8 holes - cored 70' = 560 } 860' @ $3.50

10 " " 30 = 300

4460

Stage II

42 holes @ 100'

Non-core = 8400'

20 - cored 70' = 1400 } 2060'

22 " 30 = 660

10,460

860
1400
4320

Stage III

20 holes @ 50'

Non-core = 4000'

20 core 70' = 1400 } 1400'

~~10 " 30' = 300~~

5000

Supervision, labor, consultants $9870.00 (includes taxes)

Op. Materials & sup. 555.00

Transportation 10,000 miles @ 7¢/mile 800.00

Contingencies 553.00

$11 680.00

20,320.00' = $0.57/ft

Bulldoze 24 hrs @ $12.50/hr.

plus $30 moving charge

Samples I 90
II 210
III 100
400 @ $5.00

03080 205

IN REPLY REFER TO:

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

August 18, 1955

Memorandum

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

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

Subject: DMEA Docket No. 3762, Shannon Oil Company, Laymon Property, Cook County, Wyoming.

After discussing with Mr. F. M. Murphy, DMEA, and Mr. T. H. Kiilsgaard, USGS, the proposals and provisions of the field examination report and a subsequent supplementary report by the examining engineer covering the above-referenced property the following modifications seem appropriate in considering a DMEA contract for exploration work on the property.

1) Stage I should consist of a total of 18 offset holes located no closer than 50 feet to previously-drilled mineralized drill holes by the Atomic Energy Commission.

2) Stage II should consist of a total of 42 holes on 100-foot centers arranged in a pattern much as shown on fig. 5 in the Field Team report.

3) Stage III should consist of a total of 20 offset holes located no closer than 50 feet to any previously-drilled favorable or mineralized holes.

One hundred foot spacing is recommended in Stage II because the ore bodies may be no wider than 100 feet. Fifty foot spacing is recommended in Stage III to allow placement of Stage III holes between favorable Stage II holes. Fifty foot spacing would not be considered developmental drilling in view of the expected size of the ore bodies.

WPWilliams

W. P. Williams

RECEIVED
AUG 1 0 1955

700

Surname

Murphy
Ellis
Martin
Johnson
Mittendorf

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

AUG - 5 1955

M. Traver
tive Officer
Field Team, Region III
New Customhouse Building
nver 2, Colorado

Re: Docket No. DMEA-3762 (Uranium)
Shannon Oil Company
E ½ of NW ¼ and W ½ of NE ¼,
Sec. 27, T. 52 N., R. 66 W.
Crook County, Wyoming

Dear Mr. Traver:

We find it difficult to coordinate the proposed drilling program outlined in the "Supplementary Report" included with the "Report of Examination" pertinent to the subject application.

The recommended proposal by the Field Team for Stage I is to drill 17 offset holes a minimum distance of 50 feet from five selected holes, which are part of a group of holes previously drilled by the Atomic Energy Commission on the subject property. Then Stage II would consist of drilling the 42 holes from the drill sites indicated in the original field examiners' Stage I proposal.

Tentatively plotting the holes, proposed for the new Stage I and Stage II, on the map entitled "Figure 5" attached to the report, it would appear that at least 31 of the proposed holes would be not more than 50 to 75 feet distant from other holes. We consider this spacing very close when the average depth of the drill holes is estimated at 260 feet.

On page 2 of the "Supplementary Report" mention is made that "Hole spacing is 125 feet." To clarify the exact locations of the proposed drill holes in the new Stage I and Stage II, will you please forward nine (9) copies of maps showing their approximate locations. The maps will be used as part of the proposed contract.

Regarding the proposed contract, your memorandum transmitting the "Report of Examination" did not mention the Owners' Consent to Lien" required. If you have not already done so, will you please advise the Applicant that we require two sets of the executed agreements from:

R.G.L.

1. Frank E. Laymon and Anna M. Laymon, his wife,- (holders of mineral rights).

2. Edwin F. Thorn, a single man, - (holder of surface rights).

Sincerely yours,

W. S. Martin
ACTING Chairman, Operating Committee (JHB)

APPROVED:

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

/s/ N. E. Nelson (JHB)
Member, Geological Survey

FMurphy:am
8-3-55
cc to: Admr. Reading File
Operating Committee
Docket
Messrs. J. E. Crawford, Rm. 3641
T. H. Kiilsgaard, Rm. 5222
J. O. Hosted, Rm. 3210, GSA
Code 700
Mr. Murphy

IN REPLY REFER TO:

F-3-55
Am

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

RECEIVED
AUG - 2 1955

August 1, 1955

Memorandum

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

From: Thor H. Kiilsgaard, U. S. Geological Survey

Subject: Review of Field Team Report, Shannon Oil Company, Crook County, Wyoming, DMEA Docket 3762 (Uranium).

Field examiners have studied the applicant's property, and recommend a two-stage, rotary drilling exploration program, this program modified from the one requested by the applicant. Upon being advised that the field examiners' program was not acceptable to the applicant, the Field Team concurred with the applicant and instructed the field engineer to revise his cost estimates accordingly.

There is some validity to the applicant's argument that more knowledge is needed on the size of the indicated ore bodies before a longer range exploration is undertaken. This is a debatable subject, however, as too much close spaced drilling could be interpreted as development rather than exploration. In the present instance I believe a certain amount of offset drilling, at points 50 feet from the mineralized holes, is warranted. It should be noted, however, that four holes cannot be drilled around hole 704 without coming perilously close to the property line. Three holes should suffice, with the proposed hole west of hole 704 being eliminated.

With the exception of the one above-described hole, I concur with the Field Team and recommend approval of the program proposed in the Supplementary Report. It is suggested that the contract be so worded that, with exception of the 50-foot offset holes, no other holes shall be closer than 125 feet from a previously drilled hole.

Thor H. Kiilsgaard

Thor H. Kiilsgaard

8/2/55 gla

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

RECEIVED
AUG 1 1955

July 29, 1955

Memorandum

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

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

Subject: Report of Examination, DMEA Docket 3762, Shannon Oil Company, Laymon Property, Cook County, Wyoming

I have reviewed the Field Team report of examination, Shannon Oil Company, DMEA Docket 3762; and I have discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

We agree with the program outlined in the engineer's supplemental report.

The report is being forwarded to the Chief, Division of Minerals, in accordance with the routing slip attached thereto.

John E Crawford
John E. Crawford

8/1/55 gla

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

RECEIVED
JUL 25 1955

224 New Customhouse
Denver, Colorado

July 22, 1955

ON-SITE EXAM

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: FieldTeam, Region III

Subject: Report of Examination, DMEA Docket 3762 (Uranium), Shannon Oil Company, Laymon Property, CookCounty, Wyoming

Enclosed are the original and three copies of an examination report and a supplemental cost estimate pertaining to the above application.

The revised program proposed in the examination report has been discussed with the applicant and he does not concur with the recommendations on two points as follows:

1) The applicant feels very strongly that core drilling should be attempted in the ore horizons or for a total of about 70 feet in each hole drilled through the lower horizon and 30 feet in those holes drilled only through the upper horizon.

2) The applicant wishes to retain Stage I of his proposal and if warranted then proceed with the two stages proposed by the examining team. He argues that his Stage I drilling, which consists of 50 foot offsets around A.E.C. holes that intersected ore grade material, is necessary to determine if the indicated ore bodies will be large enough and high enough grade to mine at depths of 200 to 270 feet. If the results of the offset drilling are not encouraging, the subsequent stages will not be done.

The Field Team concurs with the applicant on both points and accordingly asked the engineer to revise his cost estimate to include 17 holes in an initial drilling stage as outlined in the supplemental report, and to include core drilling. The additional $0.75 per foot is based on a verbal bid made by Minerals Engineering for a guaranteed recovery of 75% in the ore zone.

Reviewed by
DMEA OPERATING COMMITTEE
7-29-55
(date)

Experience by the U. S.Bureau of Mines, drilling on the subject claims for the A.E.C., has shown that with careful drilling an overall core recovery of 87 to 93% can be obtained. However, should an attempt at core drilling prove unsuccessful, after drilling the first few holes, the remainder should be drilled by non-core methods.

The program outlined in the engineer's supplemental report is recommended by the Field Team.

W. M. Traver

E. N. Harshman

DMEA Field Team, Region III

Enclosures

RECEIVED
JUL 25 1955
DMEA
Date Rec'd.
JUL 21 1955
U OF MINES
Denver, Colorado

Rapid City Experiment Station
School of Mines Campus
Rapid City, South Dakota

July 20, 1955

TRANSMITTED
JUL 22 1955

Memorandum

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

From: E. O. Binyon, Rapid City, S. Dak.

Subject: Supplementary Report, Revised Estimate of Costs, Docket DMEA 3762 (Uranium), Shannon Oil Company, Laymon Property, Crook County, Wyoming

Transmitted herewith are the original and ten copies of the subject report.

E. O. Binyon

Reviewed by
DMEA OPERATING COMMITTEE
7-29-55
(date)

TRANSMITTED
JUL 22 1955
RECEIVED
JUL 25 1955

DMEA 3762

SHANNON OIL COMPANY
LAYMON PROPERTY
CROOK COUNTY, WYOMING

SUPPLEMENTARY REPORT
Estimate of Costs

INTRODUCTION

Exploration of the Laymon property, as proposed in the examining team's Geologic and Engineering Report, was to be in two stages - Stage I to include drilling of a primary grid along assumed trends of mineralization, and Stage II was for offset drilling around mineralized holes of Stage I. All drilling was to be by air blast, rotary-type drill and no core drilling was proposed.

Revisions of this exploration program have been recommended by the Field Team and it is now proposed to explore the property under a 3-stage drilling program to include additional offset holes, as well as non-core and core drilling in all holes under the three stages.

Under Stage I, 17 offset holes are to be drilled at a minimum of 50 feet from AEC holes 704, 735, 708, 743, and 746. Five offset holes, four around 704 and one offsetting 735, are to be drilled to the Lakota-Morrison contact. Of the four offset holes around each of the AEC holes, 708, 743, and 746, only one hole is to be drilled to the contact or to an estimated depth of 270 feet. The other three, or a total of 9 holes, are to be drilled to an approximate depth of 205 feet or through the upper mineralized horizon. Coring is to be limited to a maximum of 70 feet in any hole. For those holes that are to be drilled to the Lakota-Morrison contact, both the upper and lower mineralized sections are to be cored and it is estimated that a total of 70 feet of

Reviewed by
DMEA OPERATING COMMITTEE
7-29-55
(date)

coring will be required - 30 feet for the upper and 40 feet for the lower section. In those holes to be drilled through the upper section, only 30 feet of core drilling is to be done.

Stage II of the revised program is to include non-core drilling as recommended under Stage I of the examining team's report, plus core drilling in all 42 holes that are drilled under this stage. Hole spacing is 125 feet.

Stage III corresponds to the old Stage II recommended by the examining team and includes both non-core and core drilling of 20 offset holes around mineralized holes of Stage II at a minimum spacing of 125 feet.

As requested, a revised estimate of the costs of exploration is submitted. In calculating the revised cost, the time for completion of Stages I, II and III has been extended to 8 months on the assumption only one drill is to be used. Also, the price per foot for coring has been increased $.75 over the regular bid price as payment for a guarantee of 75 percent core recovery.

The following table gives the bid prices used in calculation of the average price of $1.87 for non-coring and $3.50 per foot for coring, as shown in the "per foot" column of unit costs.

Depth	Price per foot		
	Non-core	Core	Core*
0 - 100	$1.75	$2.25	$3.00
100 - 200	2.00	2.45	3.20
200 - 300	2.00	2.95	3.70

* $.75 per foot added for guarantee of 75 percent core recovery.

Distribution of the holes and footage for each stage is shown in the table below and the Estimate of Costs, with Unit Costs and a Summary of Project Costs, follows.

DISTRIBUTION OF HOLES AND DRILLING FOOTAGES

Stage I - Offset Drilling

Holes Offset	Number of Offset Holes	Hole Depth	Feet Non-Core	Feet Core
704	4	270	800	280
735	1	270	200	70
708	4)3	205	525	90
	)1	270	200	70
743	4)3	205	525	90
	)1	270	200	70
746	4)3	205	525	90
	)1	270	200	70
Total	17		3,175	830
Stage II	42*	270	8,400	2,940
Stage III	20	270	4,000	1,400
TOTAL, STAGES I, II and III	79		15,575	5,170

* Not offset holes.

ESTIMATE OF COSTS

Independent Contracts

Drilling	Total Non-Core Feet	Total Non-Core $	Total Core Feet	Total Core $	Total $
Stage I	3,175	5,924.79	830	2,858.17	8,782.96
Stage II	8,400	15,750.00	2,940	10,351.74	26,101.74
Stage III	4,000	7,500.00	1,400	4,929.40	12,429.40
Total	15,575	29,174.79	5,170	18,139.31	47,314.10

Bulldozer, drill site preparation:

24 hours @ $12.50 per hour	$300.00	
Moving-in charge	50.00	
	$350.00	350.00

Drill hole logging 20,745 feet @ $.10 per foot 2,074.50

Total, Independent Contracts $ 49,738.60

Labor, Supervision, and Consultants:

1 - sampler, 8 mos. @ $350.00	$2,800.00	
1 - supervisor, 2 mos. @ $500.00	1,000.00	
1 - geologist, consultant, 80 days @ $50.00 per day	4,000.00	
geologist's expenses, 80 days @ $10.00 per day	800.00	
Mileage allowance, 11,000 miles @ 7¢ per mile	770.00	
	9,370.00	
Total Labor, Supervision and Consultants		$ 9,370.00

Operating Materials and Supplies:

Sample sacks (heavy paper), 3,000 @ $10.00 per M	30.00	
Core boxes, 250 @ $2.10 each	525.00	
Total Operating Materials and Supplies		555.00

Operating Equipment:

1 company car, mileage only, 10,000 miles @ 7¢ per mile	700.00

Rehabilitation: --

None

New Buildings, improvements, installations --

None

Miscellaneous

400 chemical analyses for uranium and vanadium 10 samples for 40 holes @ $6.00 each	$ 2,400.00	
Bookkeeper, $50 per mo. for 8 mos.	400.00	
Payroll taxes, FICA @ 2% of $4,200	84.00	
Compensation & liability insurance @ 3% of $4,200	126.00	
Total Miscellaneous		3,010.00

Contingencies, 10% of $5,665.00 (Does not include independent contracts, geologist's fees or chemical analyses)	566.50
TOTAL	$ 63,940.10

UNIT COSTS

Non-Core Drilling	Cost Total	Cost Per Foot
Independent Contracts		
Stages I, II and III	$ 29,174.79	$1.873
Labor, Supervision & Consultants, 62% of $9,370.00	5,809.40	.373
Operating Materials and Supplies	30.00	.002
Operating Equipment, 62% of $700.00	434.00	.028
Miscellaneous (less analyses), 62% of $610.00	378.20	.024
Contingencies, 62% of $566.50	351.23	.022
Total, Non-Core Drilling	$ 36,177.62	$2.322

Use $2.32 for unit cost of non-core drilling

Core Drilling		
Independent Contracts		
Stages I, II and III - 5,170 feet	$ 18,139.31	$3.508
Labor, Supervision and Consultants, 38% of $9,370.00	3,560.60	.689
Operating Materials & Supplies, core boxes	555.00	.107
Operating Equipment, 38% of $700.00	266.00	.051
Miscellaneous (less analyses), 38% of $610.00	231.80	.045
Contingencies, 38% of $566.50	215.27	.042
Total, Core Drilling	$22,967.98	$4.442

Use $4.44 for unit cost of core drilling

SUMMARY - COSTS OF PROJECT

Stage I		
Non-Core Drilling 17 holes, 3,175 feet @ $2.32 -	$7,366.00	
Core Drilling in 17 holes, 830 feet @ $4.44	3,685.20	
Total Cost, Stage I Drilling		$ 11,051.20
Stage II		
Non-Core Drilling 42 holes, 8,400 feet @ $2.32	19,488.00	
Core Drilling in 42 holes, 2,940 feet @ $4.44	13,053.60	
Total Cost, Stage II Drilling		$ 32,541.60
Stage III		
Non-Core Drilling 20 holes, 4,000 feet @ $2.32	9,280.00	
Core Drilling in 20 holes, 1,400 feet @ $4.44	6,216.00	
Total Cost, Stage III Drilling		$ 15,496.00
Total Drilling Cost, Stages I, II and III		$ 59,088.00
Stages I, II and III, Other independent contracts and chemical analyses		4,824.50
Total Cost of Project		$ 63,912.50
Government participation @ 75%		$ 47,934.38

Estimated time for completion - 8 months

DMEA
Date Rec'd.

JUL 8 1955

BUREAU OF MINES
Denver, Colorado

Rapid City Experiment Station
School of Mines Campus
Rapid City, South Dakota

July 6, 1955

TRANSMITTED
JUL 22 1955

Memorandum

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

From: Examining Team, Norman P. Cuppels, U. S. Geological Survey and E. O. Binyon, U. S. Bureau of Mines

Subject: Report of Examination, DMEA 3762 (Uranium), Shannon Oil Company, Layson Property, Crook County, Wyoming

Enclosed are the original and 10 copies of a joint Report of Examination on the subject property, including a "Summary, Conclusions, and Recommendations" and a Geologic and Engineering Report.

Also enclosed is a tracing of figure 1, the location map, of the property from which the required number of prints can be made.

The tracings for figures 2, 3, 4, and 5 were not available for use outside the A.E.C. office and we have made up 11 prints of each, which are being mailed in two tubes under separate cover.

It will be appreciated if two prints of figure 1 or the tracing are returned for our files here.

Norman P. Cuppels
E. O. Binyon

By:
E. O. Binyon

Reviewed by
DMEA OPERATING COMMITTEE
7-29-55
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 3762, Shannon Oil Company, Applicant

Laymon Property

Crook County, Wyoming

Uranium

E. O. Binyon, Mining Engineer
Bureau of Mines

N. P. Cuppels, Geologist
Geological Survey

July 6, 1955

Reviewed by
DMEA OPERATING COMMITTEE
7-29-55
(date)

DMEA 3762

SHANNON OIL COMPANY, APPLICANT
LAYMON PROPERTY
CROOK COUNTY, WYOMING

Summary, Conclusions, and Recommendations

By E. O. Binyon
Mining Engineer
Bureau of Mines

N. P. Cuppels
Geologist
Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE
7-29-55
(date)

TRANSMITTED
JUL 22 1955

DMEA 3762

SHANNON OIL COMPANY, APPLICANT
LAYMON PROPERTY
CROOK COUNTY, WYOMING

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By E. O. Binyon and N. P. Cuppels

The Shannon Oil Company, a limited partnership, 603 Midland Savings Building, Denver 2, Colorado, has applied to the Defense Minerals Exploration Administration for aid in exploration of 160 acres of leased land known as the Laymon property and located in sec. 27, T. 52 N., R. 66 W., 6th P.M. near Carlile, Crook County, Wyoming.

A joint field examination was made May 19, 1955 in company with Glenn W. Pryor, the applicant's representative, and Lawrence Gorman, staff geologist, of the Atomic Energy Commission's Hot Springs, S. Dak. sub-office. The proposed application was discussed but no agreement could be reached as to either the extent or method of exploration as there had been too little time to evaluate the available data.

Previous core drilling by the A.E.C., consisting of 27 holes spaced on approximately 500-foot centers, disclosed two mineralized sections in the Lakota sandstone near the top and bottom of the formation at depths ranging from 175 to 205 feet below the surface for the upper section and 235 to 260 feet for the lower mineralized section. From the available geologic data it appears that there are three possible trends of the mineralized sections and a coincidence of these trends with isoliths of sandstone in the Lakota. Mineralization of ore or near ore grade was found in 6 of the 27 holes drilled by the A.E.C. and a total of 14 of the 27 holes had some mineralization and/or indication of radioactivity.

The applicant proposed to explore the zones by combined plug-bit and core drilling under two separate programs, each program being divided into four phases, the first phase to be close-spaced holes (50-foot centers) around mineralized holes, with holes in subsequent phases spaced at 125 feet from mineralized holes of the preceding phase.

The applicant proposed to drill 107 holes with a total of 20,945 feet of plug-bit, and 3,580 feet of core drilling at an estimated cost of $88,932.80.

It is concluded that the property does not warrant exploration on the scale proposed by the applicant. Also, some of the proposed drilling is too closely spaced and is development rather than exploratory drilling, especially when the size of the target is considered.

In the opinion of the examining team, the favorable areas on the property can be adequately explored by rotary drilling with a less extensive program and recommends a modified drilling program in two stages. Stage I is to consist of primary drilling of 42 holes to an average depth of 270 feet or 11,340 feet, and in Stage II (offset drilling) 20 holes 270 feet in depth, or 5,400 feet, are to be drilled as offsets to the mineralized holes of Stage I. All holes are to be drilled to the Lakota-Morrison contact. The estimated cost for both stages of the modified program is $38,703.20 and the government's share at 75 percent participation is $29,029.40.

It is recommended that the property be explored under the modified program.

DMEA 3762

SHANNON OIL COMPANY, APPLICANT
LAYMON PROPERTY
CROOK COUNTY, WYOMING

Engineering and Geologic Report

By E. O. Binyon
Mining Engineer
Bureau of Mines

N. P. Cuppels
Geologist
Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE

(date)

DMEA 3762

SHANNON OIL COMPANY, APPLICANT
LAYMON PROPERTY
CROOK COUNTY, WYOMING

CONTENTS

	Page
Engineering and Geologic Report	
Introduction	1
Acknowledgements	2
Location, topography and climate	2
History and production	3
Ownership and extent	4
Geology and description of the property	4
Mineralization	6
Ore reserves	8
Present status, exploration and development	9
Mining and milling equipment and other facilities	9
Proposed exploration	9
Estimate of costs	13
Unit costs	15
Summary-costs of project	15
Conclusions	16
Recommendations	16

ILLUSTRATIONS

Figure		Follows Page
1.	Location map, Laymon Property, Shannon Oil Co., Crook County, Wyoming	2
2.	Fence diagram	5
3.	Panel diagram index map	5
4.	Composite map - sub-surface anomalous radioactivity and isoliths of sandstone in Lakota formation	7
5.	Drilling pattern	9

DMEA 3762

SHANNON OIL COMPANY
LAYMON PROPERTY
CROOK COUNTY, WYOMING

ENGINEERING AND GEOLOGIC REPORT

by

E. O. Binyon and N. P. Cuppels

INTRODUCTION

The Shannon Oil Company, a limited partnership, 603 Midland Savings Building, Denver 2, Colorado, has submitted an application to the Defense Minerals Exploration Administration for aid in exploration of leased land known as the Laymon property, located on what is called Thorn Ridge near Carlile, Crook County, Wyoming.

In the application, DMEA 3762, the applicant proposes to explore two mineralized horizons in the Lakota formation by combined plug-bit and core drilling. The proposed drilling is to be done in two separate stages designated as the "initial" and "secondary" programs, with each program divided into four phases, the drilling of Phases 2, 3, and 4 being planned from the results of Phase 1 and each succeeding phase.

Under both programs 107 holes, with a total of 20,945 feet of plug-bit drilling and 3,580 feet of core drilling, are to be drilled at an estimated cost of $88,932.80. The government's share at 75 percent participation would be $66,699.60.

A joint field examination was made by the examining team on May 19, 1955 in company with the applicant's representative and a staff geologist

of the A.E.C.'s Hot Springs sub-office.

From an evaluation of the available data, the examining team concludes that while the property warrants exploration, the applicant's proposed drilling program in part is development drilling and is more extensive than is necessary for exploration of the areas outlined. It is further concluded that a modified drilling program in which it is proposed to change both the method and order of drilling, also to eliminate all core drilling and reduce the number of holes, will adequately explore the more favorable areas on the property. Government participation in the modified drilling program is recommended.

ACKNOWLEDGEMENTS

Glenn W. Pryor, representative of the Shannon Oil Co., accompanied the examining team on the examination and discussed the application.

Lawrence Gorman, staff geologist of the Atomic Energy Commission's Hot Springs sub-office, J. W. King, Chief, Hot Springs, S. Dak., who had directly supervised core drilling previously done on the property by the Atomic Energy Commission, also accompanied the examining team and gave much valuable information on the geology and other phases of the A.E.C.'s exploratory work.

LOCATION, TOPOGRAPHY AND CLIMATE

The Laymon property includes the E½NW¼ and W½NE¼ of sec. 27, T. 52 N., R. 66 W., 6th P.M., Crook County, Wyoming. (Figure 1). As shown, the property is approximately 3 miles by road from Carlile, a small community on U. S. Highway 14. Via U. S. Highway 14, the property is 26 miles west of Sundance, Wyoming, the county seat of Crook County, and 17 miles northeast of Moorcroft, Wyoming, a rail point on the Chicago, Burlington and Quincy Railroad and the nearest

residence and small supply center. Newcastle, Wyoming, also a supply and equipment center, is 66 miles southeast of the property by way of U. S. Highways 14 and 16. To reach the property from Carlile, go 1.5 miles west on U. S. Highway 14 and turn left onto a well traveled graveled road and continue for 1.6 miles, then turn left through a gate and on to the property.

The drilling area is on cultivated land near the center of a mesa, approximately 3 miles in length and 3 miles wide, known as Thorn Ridge. The property slopes gently to the west, with altitudes of 4,400 feet on the east and 4,350 feet on the west boundaries. Relief of the ridge itself is about 200 feet and of the area in general about 450 feet, with altitudes ranging from 4,400 feet on the ridge to 3,950 feet at the Belle Fourche River.

The climate is typical of the northwestern plains states and permits year around operations except for 2 or 3 months during the winter and early spring when, owing to extreme cold and heavy snow and rainfall, operations would be only intermittent and, for short periods, practically impossible.

HISTORY AND PRODUCTION

As a part of the A.E.C.'s exploration drilling program in the area during the summer and fall of 1954, the Carlile Projects No. 1 and No. 1a (Thorn Ridge), 27 holes with an average depth of 273 feet, or a total of 7,361 feet, were drilled on the Laymon property. This is the only work done on the property and there has been no production.

However, considerable ore has been produced from a deposit in the immediate area, the Homestake Mining Company's Carlile Mine about 1/2 mile east and slightly south of the property having been one of the major producers of uranium ore in the Black Hills. At present only the underground portion of the mine is being worked and operations are intermittent.

OWNERSHIP AND EXTENT

The applicants hold the surface and mineral rights on the Laymon property under separate leases, one an agreement and lease with Edwin F. Thorn, Crook County, Wyoming, owner of the surface rights, and the other a mining lease covering mineral rights with Frank E. and Anna M. Laymon, 584 E. 8th Str., Sheridan, Wyoming, joint owners of the mineral rights. The agreement and lease grant the applicant surface rights for a definite period of 5 years and contains a clause permitting an extension of time if there is production from the property. The mining lease is for a 10-year period and also has a clause to permit an extension of the lease.

As described in the application, the property includes 160 acres "more or less" of the E$\frac{1}{2}$ of the NW$\frac{1}{4}$ and the W$\frac{1}{2}$ of the NE$\frac{1}{4}$, section 27, Crook County, Wyoming.

GEOLOGY AND DESCRIPTION OF THE PROPERTY

The Shannon Lease is located on Thorn Ridge in the northwestern part of the Black Hills of Wyoming. The "ridge" is actually a mesa roughly 3 miles long, nearly as wide, and with an average relief of about 200 feet. Altitudes in the area range from 4,400 feet on top of the mesa to 3,950 feet in the channel of the Belle Fourche River,

which flows northward along the east side of the mesa. The mesa is capped by the Fall River sandstone of the lower Cretaceous Inyan Kara group, as shown on the geologic map accompanying this report. In order of increasing age, the Inyan Kara group consists of the Fall River sandstone, Fuson formation, and Lakota sandstone. The Morrison formation, which underlies the Lakota sandstone, has been exposed by erosion in the valley of the Belle Fourche River. There are no rock outcrops within the leased area. All subsurface data have been compiled from the results of an A.E.C. drilling program carried out during the summer and fall of 1954.

Stratigraphy of the Inyan Kara group is shown on the enclosed fence diagram and the position of the fence diagram with respect to the leased area is shown on the panel diagram index map. The Inyan Kara group has an average thickness of about 240 feet and consists chiefly of land-laid sediments which accounts for the abrupt facies changes--particularly within the component formations. Pyrite is abundant in many parts of the section and accounts for the gray to green colors of the sediments which are indicative of a reducing chemical environment. Average thickness of the Fall River sandstone is about 40 feet and the unit consists chiefly of buff-colored, fine-grained sandstone. The underlying Fuson formation is about 100 feet thick and consists of gray to blue-gray mudstone with thin beds of very fine-grained, micaceous sandstone. The Lakota sandstone is approximately of the same thickness as the Fuson formation, and consists of an upper and a lower sandstone sub-unit separated by a gray to blue-gray, mudstone that contains thin beds of siliceous sandstone. Locally, carbonaceous and

peaty material is abundant in the mudstone. The basal unit of the Lakota sandstone is a coarse, thoroughly indurated, conglomeratic sandstone.

Mineralization

Most of the uranium ore produced in the Black Hills has come from the Lakota and Fall River sandstones, in about equal quantities. In the Thorn Ridge area, all ore deposits and mineralized zones found to date are restricted to two sandstone sub-units in the Lakota sandstone.

The upper ore zone is in a fine- to medium-grained sandstone which ranges in thickness from 3 to 60 feet. Locally, this sandstone sub-unit contains abundant clay pebbles and is heavily iron-stained. Within the Shannon lease the sandstone ranges in thickness from 10 to 50 feet and the altitude of the contained ore varies from 4,180 to 4,215 feet. The lower ore zone is in a white to light-gray sandstone which has abundant clay pebbles in some places and is underlain by a silicified, conglomeratic sandstone. Areally, this sandstone sub-unit ranges in thickness from 30 to 110 feet, but within the Laymon property its thickness ranges from 30 to 65 feet. Altitude of the ore zone in this sandstone ranges from 4,100 to 4,120 feet. Mineralized rock in both sandstone sub-units is commonly friable, making core recovery difficult.

A background radioactivity of 40 to 50 counts per second was established when the A.E.C. drill holes were probed with gamma-ray logging equipment. All anomalous radioactivity in excess of 2,000 counts per second is restricted to the two ore zones of the Lakota sandstone described in the preceding paragraph, although anomalies greater than 300 counts per second are distributed throughout the Lakota

sandstone. Thickness of the upper ore zone ranges from 2 to 7 feet and averages 3.6 feet. The lower ore zone ranges in thickness from 2 to 8 feet and averages 6 feet. Any precise correlation between gamma-ray values and chemical or equivalent uranium percent is unknown to the examining team. Gamma-ray values are useful chiefly for rough comparative purposes. A comparison of gamma-ray logs of the drill holes on the Laymon property and chemical analyses of samples taken from the same holes suggest that sediments containing 0.1 percent uranium will give a gamma-ray reading of about 5,000 counts per second, but the counts per second-percent uranium ratio is not constant.

Gamma-ray logs of drill holes within and near the Shannon Lease indicate that there are three groups of holes that penetrate rocks having anomalous radioactivity in excess of 2,000 counts per second. Although the area included within a line enclosing each of these groups of holes is referred to as a zone in this report, it should be emphasized that this designation does not imply that the Lakota sandstone is continuously mineralized within the zone. A zone in the north-central part of the leased area trends northerly, a northeasterly-trending zone is in the west-central part of the area and a less well-defined zone in the southern part of the area trends southeasterly. There is a coincidence in trends of these zones with isoliths of sandstone in the Lakota sandstone. This relationship is indicated on the enclosed composite map (figure 4) showing subsurface anomalous radioactivity and isoliths of sandstone in the Lakota sandstone. These zones not only trend with the sandstone isoliths but appear to follow relatively abrupt changes in the sandstone content of the Lakota sandstone.

The Homestake uranium mine, largest producer in the Black Hills, is 2,500 feet southeast of the leased area. Uraniferous rocks at this mine are restricted to the upper Lakota sandstone. The ore body is roughly tabular, 3 to 7 feet thick, 280 feet long and 160 feet wide. The carnotite-type ore is found as interstitial fillings in the sandstone. According to unpublished A.E.C. reports, sedimentary features that may have controlled localization of ore at this mine include lensing of the upper Lakota sandstone, an impermeable mudstone underlying the ore sandstone, coarse sediments, and carbonaceous seams. The ore is associated with thin beds of siliceous and calcareous sandstone. Geologists of the A.E.C. suspect that the ore at the Homestake mine may trend northwestward toward the Shannon Lease.

ORE RESERVES

Based only on the data from gamma-ray logs, the reserves of inferred ore in the upper "horizon" around the holes numbered 756-743, 748, 900 and 903 are estimated to be between 400 and 500 tons, with an average grade of .17 percent U_3O_8. In the lower section or "horizon" of the Lakota formation cut by holes 704 and 735 and the offset hole 905, reserves are estimated at about 150 tons with a grade of no more than .20 percent U_3O_8. (This figure of .20 percent is purely a guess as only hole 704 had an assay of .30 percent). Hole 735 data had a count per second of 9800, but the analyses showed only .05 percent U_3O_8.

It should be stressed that the examining team considers the above estimated tonnages and grades as no more than a very rough guess and that the estimate is practically meaningless.

PRESENT STATUS, EXPLORATION AND DEVELOPMENT

No exploratory or development work has been done on the property since completion of the A.E.C. drilling program previously mentioned under History and Production.

As mentioned, 27 holes with an average depth of 272.5 feet, or a total of 7,361 feet, were drilled. All holes were drilled through the Lakota-Morrison contact, which occurs at depths ranging from 247 to 278 feet, with an average depth of 260 feet.

The hole spacing on that part of the grid pattern that covers the property is in general 500 feet, with variations of 50 feet more or less, but in two instances - holes 753 to 754 and holes 723 to 733 - the spacings are 350 and 700 feet respectively. Three of the 27 holes, Nos. 900, 903 and 905, were drilled as shown on the map (figure 5) as offsets around the mineralized or ore holes, Nos. 743, 746, 704, and 735.

MINING AND MILLING EQUIPMENT AND OTHER FACILITIES

There is no mining or milling equipment on the property and the only surface facilities consist of a house and two or three small sheds.

PROPOSED EXPLORATION

Exploration, as proposed by the applicant, is to be by plug-bit and core drilling and is limited to certain areas around two groups of mineralized holes and along what are assumed to be trends of the two mineralized sections near the top (elevation 4,180 to 4,215) and bottom (elevation 4,100 to 4,120) of the underlying Lakota formation.

Two drilling programs are proposed: an "initial program" to explore the upper section and a "secondary program" for exploration of the lower section. Each program is divided into four phases; Phase 1 is close

spaced drilling on 50-foot centers around five of the nine mineralized holes and is for the purpose of establishing trends. In Phase 2 the spacing is increased to 125 feet and the location of the holes is dependent on the results of Phase 1. For Phase 3 the spacing is also 125 feet and the holes offset mineralized A.E.C. holes and those drilled in Phase 2. In Phase 4 the holes are spaced at 250 feet from the A.E.C. holes and also along mineralized trends.

In brief, Phases 2, 3 and 4 are designed to form a grid pattern with a spacing of 125 feet around all mineralized holes and along the assumed trends of mineralization. Under all four phases of the "initial program" 70 holes are to be drilled with plug-bit to a depth of 175 feet, or a total of 12,250 feet of plug-bit drilling, and an additional 30 feet per hole (from 175 to 205) or 2,100 feet is to be core drilled through the upper mineralized section. In the "secondary program" it is proposed to drill 37 holes to a depth of 235 with plug-bit, or a total of 8,695 feet. Also, each of these holes would then be core drilled from 235 to 275 feet, or a total of 1,480 feet of core drilling. Total plug-bit drilling proposed under both programs is 20,945 feet in 107 holes and the total footage to be core drilled in these holes is 3,580 feet.

The applicant's estimate of the total cost of both programs is $88,932.80, of which the government's share at 75 percent participation would be $66,699.60.

In the opinion of the examining team the applicant's proposed drilling program is more extensive than is required to explore the favorable areas as outlined on figure 4. The 20 holes under Phase 1 with a total of 2,980 feet of plug-bit drilling and 680 feet of core drilling are considered development drilling and should not be included. Also, the

proposed core drilling is believed to be unnecessary for two reasons: 1) sufficient geology data on lithology, positions of formation, contacts and structure are available from previous drilling; and 2) core recovery in the more highly mineralized sections was extremely low, averaging about 20 percent in the lower section and 55 percent in the upper section. Actually, the average recovery in the upper section is still lower if it is confined only to the higher grade parts of the section. The detailed sampling at intervals of 1 foot is unwarranted and the number of samples can be decreased and thereby reduce the number of analyses.

It is suggested that a modified drilling program as outlined below be substituted for the programs proposed by the applicant.

The modified program is to be in two stages; under Stage 1, 42 holes with an average depth of 270 feet, or a total of 11,340 feet, are to be drilled. The holes are to be located as shown on figure 5 with the minimum spacing 125 feet. In Stage 2, 20 holes, or 5,400 feet, are allowed for offset drilling. The offset holes, not shown on figure 5, are to be spaced at no less than 125 feet from the mineralized holes of Stage 1 and are to be drilled only after Stage 1 is completed and the results evaluated.

It is recommended that the drilling be done with an air blast rotary drill equipped with a Duclone or similar type sample collector.

All holes shall be drilled to the Morrison formation. The estimated depth of 270 feet used in calculation of total footage is 8 feet less than the deepest of the 27 holes (278 feet) drilled through the Lakota-Morrison contact by the A.E.C. but is 10 feet greater than the average depth of 260 feet and should be sufficient to reach the contact in all holes.

Sampling shall be confined to the Lakota formation or from the estimated depth of the Fuson-Lakota contact at 170 feet to the bottom of each hole. A sample interval of $2\frac{1}{2}$ feet, or approximately 40 samples per hole, will provide the necessary geologic data on lithology and will be adequate for sampling the mineralized sections.

Hole probing should be done with gamma-ray equipment in order to correlate the results with results from A.E.C. holes. The holes should be probed as soon as possible and probing should not be delayed more than seven days after completion of a hole. Those holes which have not been probed within seven days and then, because of caving, cannot be probed to the desired depth, shall be redrilled and probed at the operator's expense. Payment for drilling and probing by the government shall be made only for probed footage in the original hole at any location.

Also, in the event bad ground or other conditions prevent drilling to the desired depth, then payment is to be made only for the footage drilled in the original hole, plus the footage drilled in the second or subsequent holes from a depth in the original hole to the target depth.

Chemical analyses are to be required on all samples with a radioactivity of 4,000 or more counts per second.

The applicant intends to contract the drilling and has submitted copies of bids from four contractors. Of these, Livingston and Wilson, Exploration Drilling, Longmont, Colorado, submitted the lowest bid of $1.75 per foot for plug-bit drilling to 235 feet. The Ray Drilling Co. Inc., Salt Lake City, Utah, bid an average price of $1.77 per foot for non-core drilling and the price per foot of the Minerals Engineering Company, Grand Junction, Colo., for non-core drilling was $1.90 per foot for depths up to 300 feet.

In the cost estimate for the proposed modified drilling program, a price of $1.75 per foot is used. No allowance is made for standby time and since the probing is also included under an independent contract and would be done after completion of the hole, there should be no undue delay.

Drilling areas are relatively level and the amount of dozer work required can be completed in 3 days using a D-6 or similar size dozer. The rental rate in the district for a D-6 is $12.50 per hour and usually $50.00 is charged for moving in. A salary of $500.00 per month is allowed for a supervisor part time, but the expense allowance has not been included in the estimate of cost.

For a consulting geologist the usual local rate is $50.00 per day and expenses and this is allowed. A sampler is required and has been included in the cost estimate.

Allowances for mileage have been made but at a reduced rate from that submitted in the application.

Estimated time for completion of the drilling based on an average drilling rate of 200 feet per day is 85 days, or 3-1/3 months using a 26 work-day month, and it is estimated the contract can be completed in 4 months.

ESTIMATE OF COSTS

As stated, the modified program is to be in two stages, with the drilling allotted to each stage as follows:

Stage I -	42 holes @ 270 feet per hole	-	11,340 feet
Stage II (Offset drilling) -	20 holes @ 270 feet per hole	-	5,400 feet
Total	62 holes		16,740 feet

± 4,000 feet

In estimating the number of holes for Stage II or offset drilling, an additional 10 percent has been added to the percentage of mineralized holes found by A.E.C. drilling. Approximately 36 percent, or 10 of the 27 holes drilled, were mineralized sufficiently to warrant offset holes.

Independent Contracts			
Rotary Drilling			
Stage I - 11,340 feet			
Stage II - 5,400 feet			
Total 16,740 feet @ $1.75 per foot			$29,295.00
Bulldozer, drill site preparation			
24 hours @ $12.50 per hr.	$ 300.00		
Moving in charge	50.00		
	$ 350.00		350.00
Drill hole logging 16,740 feet @ $.10 per ft. (Gamma-ray logs)			1,674.00
TOTAL, Independent Contracts			$31,319.00
Labor, Supervision and Consultants			
1 - sampler, 4 mos. @ $350.00 per mo.			1,400.00
1 - supervisor, 1 mo. @ $500.00 per mo.			500.00
1 - geologist consultant, 40 days @ $50 per day -		$2,000	
Geologist's expenses, 40 days @ $10 per day -		400	
Mileage allowance, 5500 miles @ 7¢ per mile -		375	
		$2,775	2,775.00
TOTAL, Labor, Supervision and Consultants			$ 4,675.00
Operating Materials and Supplies			
Sample sacks, 3,000 @ $10.00 per M (Heavy weight paper)			30.00
Operating Equipment			
Supervisor's car - mileage only, 5000 miles @ 7¢ per mile			350.00
Rehabilitation and Repairs			
None			
New Buildings, Improvements and Installations			
None			

Miscellaneous:

310 chemical analyses for uranium & vanadium 10 samples for 31 holes @ $6.00 per sample -	$1,860.00	
Bookkeeper @ $50 per mo. for 4 mos.	200.00	
Payroll taxes, FICA @ 2% of $2,100	42.00	
Compensation and liability insurance @ 3%	63.00	
TOTAL Miscellaneous		$ 2,165.00
Contingencies, 10% of $2585.00 (rounded) (Does not include independent contracts, geologist's fees or chemical analyses)		258.50
TOTAL		$38,797.50

The different contract forms were discussed with the applicant's representative and he stated that in his opinion the unit cost, short form contract would be preferred by the applicant.

Unit Costs

		Cost Total	Cost Per Foot
Independent Contracts:			
Rotary Drilling - Unit-Feet		$29,295.00	$ 1.750
Labor, Supervision and Consultants		4,675.00	.279
Operating Materials and Equipment		380.00	.023
Miscellaneous (Less analyses)		305.00	.018
Contingencies		258.50	.015
TOTAL, Rotary Drilling		$34,913.50	$ 2.085*
* Use $2.08			
Other Independent Contracts:			
Dozer work - unit-hour	$ 350.00		
Hole logging - unit-feet	1,674.00		
Miscellaneous, chemical analyses - unit-sample	1,860.00		
	$ 3,884.00	3,884.00	.232
TOTAL		$ 38,797.50	$ 2.317

Summary-Costs of Project

Stage I - Rotary drilling 42 holes, 11,340 ft. @ $2.08 -	$23,587.20
Stage II - Rotary drilling 20 holes, 5,400 ft. @ $2.08 -	11,232.00
	$34,819.20
Stages I & II, Other Independent contracts & chemical analyses	3,884.00
TOTAL COST OF PROJECT	$38,703.20
Government participation @ 75%	$29,027.40

CONCLUSIONS

Based on the results of previous exploratory drilling on the Laymon property by the A.E.C., further exploration of the property should be undertaken.

The available geologic data indicate possible trends of mineralization in two sandstone sub-units near the top and bottom (upper and lower sections respectively) of the Lakota formation in which the grade of mineralization (some ore grade in six holes) is sufficient to warrant further exploration. The applicant's proposed program is not the most feasible method of exploration and also includes some development drilling. A modified, two-stage rotary drilling program confined to the assumed trends will adequately explore the more favorable areas.

RECOMMENDATIONS

It is recommended that the government participate in a proposed modified, two-stage drilling program to include drilling of 42 holes or 11,340 feet under Stage I and 20 holes, or 5,400 feet of offset drilling, under Stage II; Stage I to be completed and the results evaluated before Stage II is started. A unit cost, short form contract for a total expenditure of $38,703.20, with the government's share at 75 percent participation of $29,077.40, is recommended.

If possible, the operator shall be required to furnish lithologic logs of all holes and gamma-ray logging data shall also be made available to the government.

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

RECEIVED
JUL 18 1955

224 New Customhouse
Denver, Colorado

July 15, 1955

Memorandum

To: E. O. Binyon

From: Executive Officer, DMEA Field Team, Region III

Subject: DMEA Docket 3762 (Uranium), Shannon Oil Company, Laymon Property, Cook County, Wyoming

The exploration program recommended in your joint report with Cuppels has been discussed with Mr. Pryor, representing the applicant company. He feels very strongly that core drilling is desirable as recommended in his application and that at least seventy-five per cent core recovery can be obtained in the ore zones. The U. S. Bureau of Mines core recovery while drilling the Lakota ore horizon for the AEC ranged from 87 to 93%.

The Minerals Engineering bid with no core recovery guarantee was as follows:

Depth	Price per Foot Core	Price per Foot Non Core
0 - 100	$2.25	$1.75
100 - 200	2.45	2.00
200 - 300	2.95	2.00

Mr. Pryor has a commitment from Minerals Engineering that for an additional $0.75 per foot (at all depths) they will guarantee a 75% core recovery in the ore zone. We are therefore inclined to concur with Mr. Pryor that core drilling should be attempted. Core drilling is estimated at 70 feet per hole (30 feet in the upper horizon and 40 feet in the lower horizon).

Will you please write a brief supplement to the report giving the estimated costs for the program if 70 feet of core drilling is allowed for each hole. Bids submitted by Minerals Engineering (plus the seventy-five cents additional charge per foot for 75% core recovery guarantee) should be used for these cost estimates without designating the drilling company by name in your supplemental memorandum.

After discussions with Mr. Pryor, the Field Team is inclined to recommend a three stage program. Stage I would consist of four offset holes around AEC holes 704, 708, 746 and 743 and one hole offsetting

AEC hole 735. The offset holes would be a minimum of 50 feet from the AEC holes. Offsets around hole 709 and 735 would be drilled to the Lakota-Morrison contact, one of the four offsets around hole 708, 746 and 743 would be drilled to the Lakota-Morrison contact, the remaining offsets would be drilled to explore the upper Lakota ore horizon only. Stages II and III would correspond to your recommended Stages I and II.

Please give preparation of this supplement top priority.

W. M. Traver

E. W. Harshman

DMEA Field Team, Region III

WMT:dja
cc: Harshman
Cuppels
Townsend
Subject
Chron
Sec.Op.Comm. (2)

5/12/55 gla

...ENT OF THE INTERIOR
...Minerals Administration
RECEIVED
MAY 12 1955

224 New Customhouse
Denver 2, Colorado

May 5, 1955

Memorandum

To: E. O. Binyon (w/brochure)
N. P. Cuppels

From: DMEA Field Team, Region III

Subject: Docket DMEA 3762 (Uranium), Shannon Oil Company (Sec. 27, T. 52 N., R. 66 W), Layman property, Crook County, Wyoming

Enclosed are copies of the subject loan application in the amount of $88,932.00, transmittal thereof by the Chairman of the Operating Committee, and memoranda to E.W. Ellis from E.L. Newcomb, USGS, and John E. Crawford, USBM, members of the Uranium Commodity Committee.

After referral to the Denver Exploration Branch, AEC, a joint field examination and covering reports are required. The property is located in an area where the Bureau of Mines performed drilling for the AEC. Such close spaced drilling as suggested by the applicant could possibly be interpreted as development rather than exploration.

W. M. TRAVER
W. M. Traver

E. N. Harshman
E. N. Harshman

Enclosures

WMT:jp
cc Subject
Chron
Harshman w/copy Chairman's ltr & attachments
Sec. Op. Comm.

700

Surname copy
Murphy
Selfridge

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

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

APR 28 1955

Re: Docket No. DMEA-3762 (Uranium)
Shannon Oil Company
E½ NW¼ and W½ NE¼, Sec. 27,
T. 52 N., R. 66 W.
Crook County, Wyoming

Dear Mr. Traver:

The subject application is referred to Region III Field Team for investigation, a field examination, and recommendations. A copy of the application was retained by your office.

Enclosed are copies of memoranda from J. E. Crawford, dated April 18, and E. L. Newcomb, dated April 20, 1955, members of the Uranium Commodity Committee.

In the event that the Field Team believes a project to further explore the captioned property is warranted, the Applicant should be required to submit bids from three independent contractors for the drilling. Also, the Applicant should be advised that we will require the usual executed Owner's Consent to Lien forms.

Some of the cost figures submitted by the Applicant appear to be excessive; however, the Field Team, can probably adjust these figures after their examination of the property.

Sincerely yours,

George C. Selfridge by ESF
Chairman, Operating Committee

Enclosures

APPROVED:

/s/ Robert W. Goodloe by ESF
Member, Bureau of Mines

Thor H. Kiilsgaard by ESF
Member, Geological Survey

FMMurphy/gla
4-25-55
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. J. E. Crawford, Rm. 3641
T. H. Crawford, Rm. 5224
J. O. Hosted, Rm. 3210, GSA
Code 700
Mr. Murphy

R.S.S.

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

Surname copy
Murphy
Ellis
Gukson
Kilsgaard
~~Selfridge~~
Selfridge
R Johnson

APR 28 1955

Mr. R. S. Shannon, Jr.
Shannon Oil Co.,
603 Midland Savings Bldg.
Denver 2, Colorado

Re: Docket No. DMEA-3762 (Uranium)
E½ NW¼ and W½ NE¼, Sec. 27,
T. 52 N., R. 66 W.
Crook County, Wyoming

Dear Mr. Shannon:

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

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

The Regional Office will contact you in regard to your project.

Sincerely yours,

C. O. Mittendorf

Administrator

FMMurphy/gla
4-25-55
cc to: Admr.'s Reading File
Docket
Code 700
Mr. Murphy
DMEA Field Team, Region III (2)

4/20/55 gla

IN REPLY REFER TO:

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
APR 20 1955

April 20, 1955

Re: DMEA-3762
Shannon Oil Co.
(F. E. Layman
Property)
Crook Co., Wyoming
$88,932.80 - Uranium

Memorandum

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

From: E. L. Newcomb, U. S. Geological Survey

Subject: Review of application

The applicant has proposed a two phase program of drilling to explore the upper Lakota formation. Although ultimately the project will involve a large amount of drilling, the plan of exploration is well conceived and will be continued only so long as favorable results are obtained.

The proposed drilling is a logical extension of preliminary drilling completed by the Atomic Energy Commission. The A.E.C. has drilled 27 holes to an average depth of 270 feet with an aggregate total footage of 7,361 feet. Holes 704, 708, 743, 746, and 900 penetrated ore grade mineralized ground. With the exception of Hole 704, all of these holes encountered uranium in the upper Lakota. It is possible that Holes 704 and 735 (below ore grade mineralization) have proven the presence of mineralization in the basal part of the Lakota. Of the 27 A.E.C. holes, 11 holes cut uranium mineralization.

All of the offset drilling of Stage I is not warranted. The best holes, in the two ore horizons, are 743, 746, 704 and 708. Offsetting should be limited to these four holes. In the event these holes are successful, then Stage II should be undertaken. It would seem likely that a three stage program would be sufficient to adequately explore the property. After Stage I the location of succeeding holes will be subject to previous results.

I recommend this application be referred to the Field Team for an examination and a report of their investigation.

E. L. Newcomb

E. L. Newcomb

4/19/55 gfa

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

APR 19 1955

April 18, 1955

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee

From: Bureau of Mines Member
Uranium Commodity Committee

Subject: DMEA Docket 3762, Shannon Oil Company, claims in Crook County, Wyoming

I have reviewed the attached application of Shannon Oil Company, DMEA Docket 3762, and have discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

We suggest that the application be referred to the Field Team for examination and report and that the Field Team be requested to discuss the application with C. C. Towle, Atomic Energy Commission, Denver, Colorado.

John E. Crawford
John E. Crawford

Attachment

Copy to: Division of Minerals
Branch of Rare & Precious Metals
J. O. Hosted (2)
J. E. Crawford (2)

April 11, 1955
Subject: DMEA 3762
Re: Exploration Assistance

Shannon Oil Co.
603 Midland Savings Bldg.
Denver 2, Colorado

Gentlemen:

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

Your application has been assigned Docket Number DMEA 3762 and referred to the Rare and Miscellaneous Metals Division.

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

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

April 11, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region III

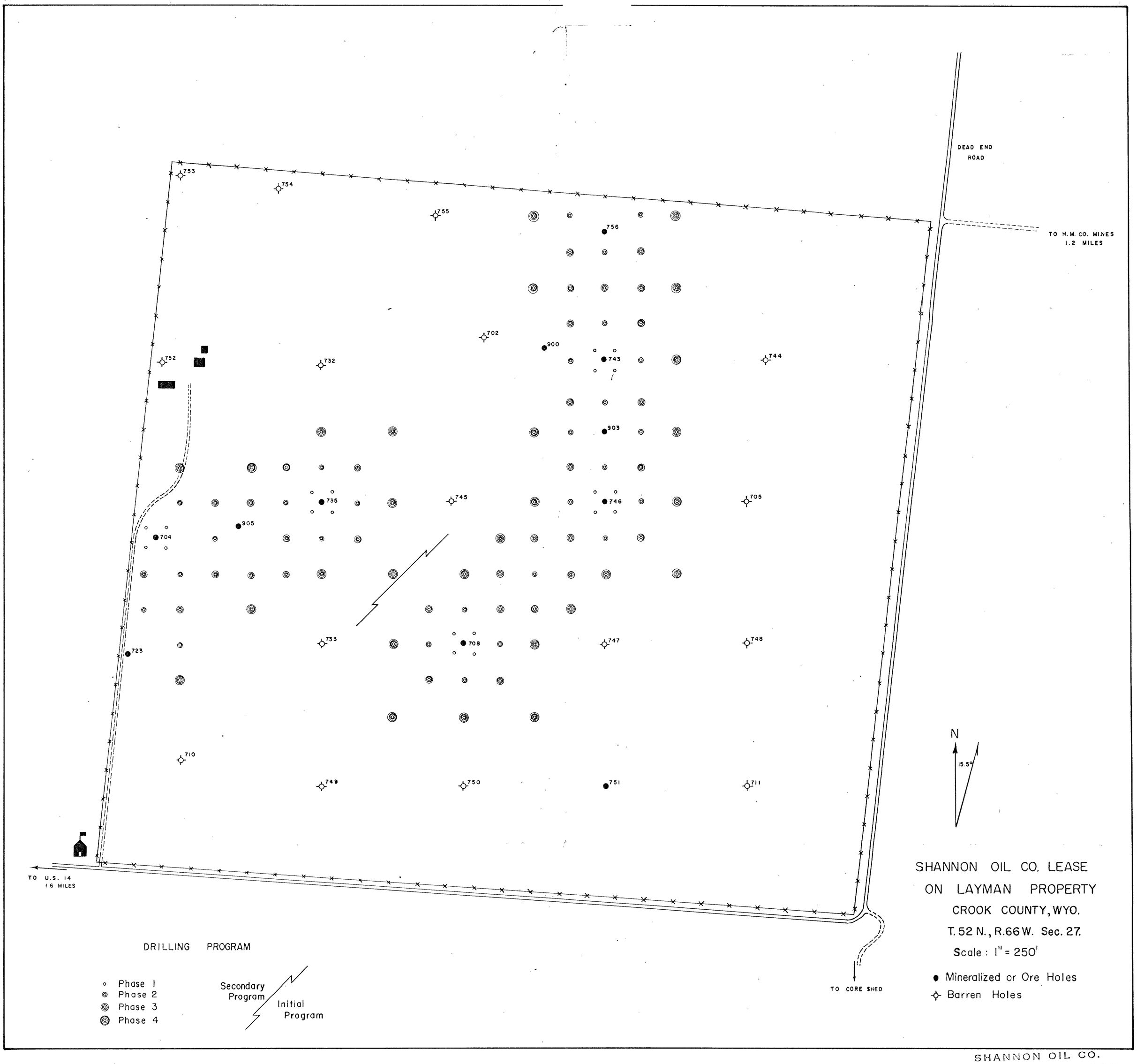
From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

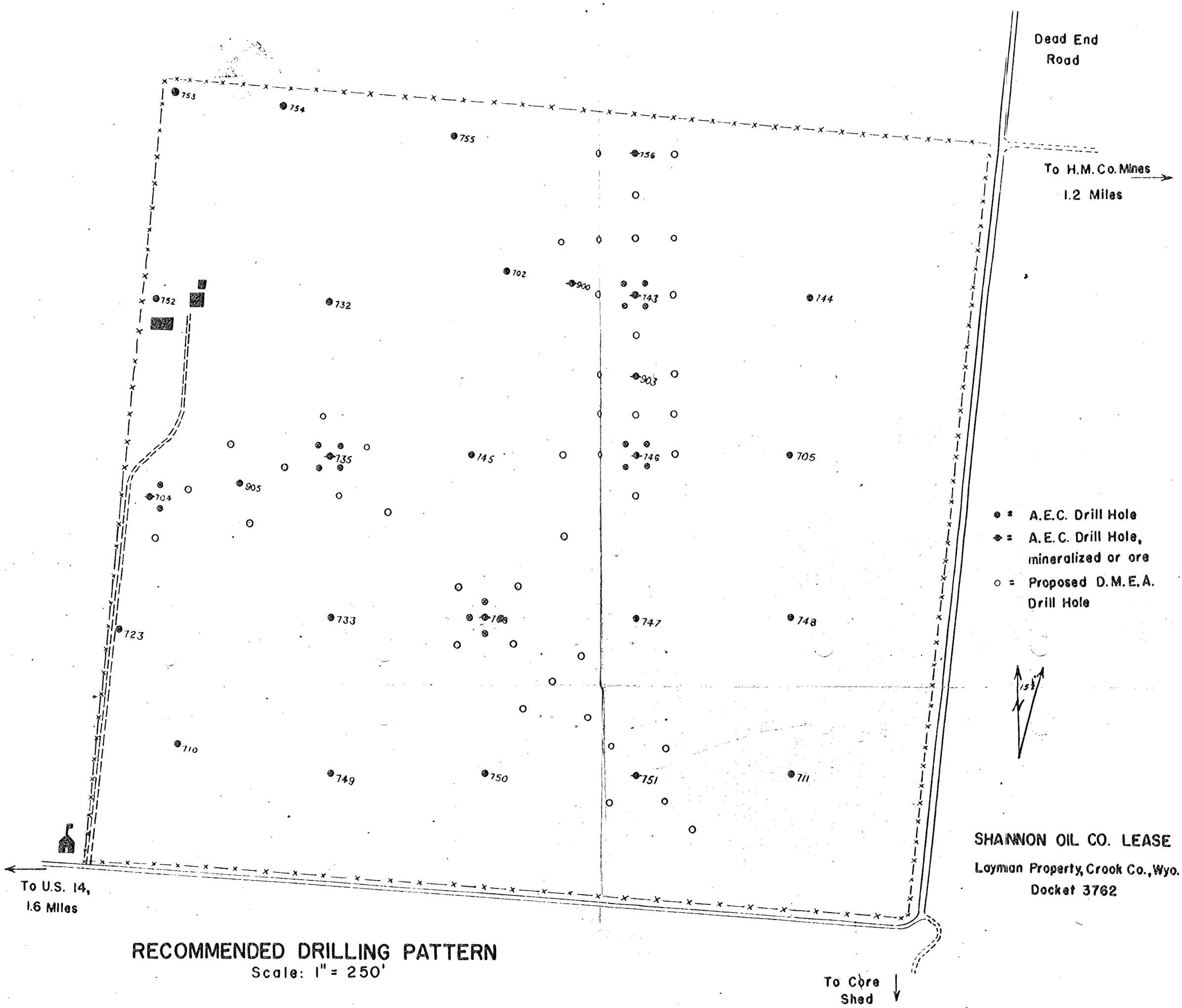
There is listed below the assigned docket number to an application recently received from Region III.

DMEA - 3762 Shannon Oil Co.

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



SHANNON OIL CO.
603 MIDLAND SAVINGS BLDG.
DENVER 2, COLO.



RECOMMENDED DRILLING PATTERN
Scale: 1" = 250'

Fig. 5