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MF-200
(Revised June 1954)

Docket No. DMEA-3727

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] Santa Fe Uranium Company, Inc. c/o Nathan Wechsler, whose mailing address is 1010 Vermont Avenue, N. W. Washington, D. C., 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 3

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 New Mexico, County of McKinley, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] Lessee of [5] 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] see Annex I, [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: See Annex I

(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: Performance Bond for $10,272.00

(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 April 15, 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 $13,696.00. The Government shall contribute 75 percent of the allowable costs as they are incurred in a total sum not in excess of $10,272.00: *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.

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.*—

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By .....

.....
(Operator)

By .....

.....

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

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9/13/55

EXPLORATION PROJECT CONTRACT
SANTA FE URANIUM COMPANY, INC.
DOCKET NO. DMEA-3727

ANNEX I

The land referred to in Article 2 of the contract form comprises the S.W. ¼ of Sec. 18, T. 13 N., R. 10 W., N.M.P.M., McKinley County, New Mexico.

The property, consisting of 163.38 acres, is Navajo Indian allotted land leased to Brown Vandever, Allottee 077031, who assigned the lease to Glenn D. Williams and J. T. Hutton, on June 7, 1951. J. T. Hutton and wife assigned their interest to Glenn Williams, January 26, 1953. Glenn Williams assigned lease to Santa Fe Uranium Company on June 23, 1954.

EXPLORATION PROJECT CONTRACT
SANTA FE URANIUM COMPANY, INC.
DOCKET NO. DMEA-3727

EXHIBIT "A"

Description of the Work

The object of this project is to explore the Jurassic Todilto limestone, underlying the subject property, by means of rotary drilling. It is estimated that drill holes averaging 85 feet in depth will be required to penetrate this ore-bearing limestone, which ranges from 10 to 35 feet in thickness.

The work shall be divided into two stages. The operator shall complete all the work in Stage I and so much of Stage II as is approved in advance in writing by the Government.

STAGE I

Stage I shall consist of rotary drilling not in excess of 83 holes totaling approximately 7,055 feet. The approximate locations of the drill holes are shown on attached map entitled "Figure 3 - Map Showing Mine Workings, Old Holes, And Proposed Holes of Santa Fe Uranium Co., - - - - -." The holes shall be drilled along 8 east-west trending lines spaced about 200 feet apart. The interval between holes on their respective lines shall be 100 feet. The holes along successive lines shall be staggered. The southernmost line shall be about 150 feet north of the southern boundary of Sec. 18. The end holes in alternating lines shall be about 150 feet and 200 feet east of the western boundary of Sec. 18.

If the drill footage estimated for Stage I drilling is not sufficient to complete the 83 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.

Not in excess of 50 samples shall be chemically analyzed for their U_3O_8 content under this Stage I of the contract.

STAGE II

Stage II shall consist of drilling not in excess of 52 offset holes, aggregating not in excess of 4,420 feet of rotary drilling. The offset holes shall be drilled not closer than 50 feet N. 45° W., N. 45° E., S. 45° W., and S. 45° E. from any mineralized hole discovered in Stage I drilling.

No hole drilled under Stage II shall be closer than 50 feet to any previously drilled hole.

Not in excess of 40 samples shall be chemically analyzed for their U_3O_8 content under this Stage I of the contract.

General Provisions

A geologist-mining engineer and one helper shall be employed full time under this contract.

All holes shall be cased, or drilled wet, using drilling mud (Aguagel, Silvacel, or any other type of sealing additive) through the overburden and unconsolidated rocks. From about 20 feet above the estimated top of the Todilto limestone, the hole will be drilled dry until it penetrates at least 5 feet into the underlying Entrada sandstone. However, if cuttings from the hole, at this depth, register

0.02 percent eU_3O_8 or more on a Geiger instrument used to check the return air stream, then the hole shall be continued until the instrument registers less than 0.02 percent eU_3O_8.

Starting from a point in the drill hole not lower than 10 feet above the estimated top of the Todilto, all cuttings will be tested by placing a Geiger tube in the return air stream at the mouth of the drill hole.

When the Geiger instrument registers 0.02 percent eU_3O_8 or more, samples shall be collected at each 1-foot interval. All samples collected shall be checked radiometrically in the field. Every tenth sample registering in excess of 0.02 percent eU_3O_8 shall be chemically analyzed to verify the results of the radiometric analysis.

One-half of all samples that are assayed, radiometrically or chemically, shall be properly identified as to hole number and depth represented, and then stored for Government use.

All drill holes shall be logged radiometrically as soon as completed.

The Operator, together with his monthly report, shall submit a map of the property showing the location of all holes drilled with their collar elevations and depths indicated; also, copies of the driller's logs and results of sample analyses.

The Government will not contribute to the cost of any hole which does not penetrate the Todilto limestone or to any hole which cannot be probed with radiometric logging equipment.

The supervision, the extent and method of sampling, the location of drill holes, and the drilling method used are all subject to Government approval.

	Costs	
Independent Contracts, 1/ Category (1)		
11,475 feet of rotary drilling @ $0.80/ft. (includes casing or use of drilling mud)	$9,180.00	
Fixed Unit Costs		
Incidental allowance 2/ for each foot of drilling completed, 11,475 feet @ $0.37/ft.	4,245.75	
Chemical analyses for U_3O_8,		
90 samples @ $3.00 each	270.00	
Total Estimated Cost of Project (rounded)		$13,696.00
Government Participation @ 75%		$10,272.00

1/ Categories (2) through (7) do not apply to this contract.
2/ Includes all costs whatsoever that are not included in the estimates for "Independent Contracts" and analyses of samples, and includes such items as supervision, labor, payroll taxes, materials, supplies, rental of radiometric logging equipment, etc., which would otherwise be allowable under Categories (2) through (7) of the contract form.

Surname copy

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

OCT 4 - 1955

Mr. Nathan Wechsler
Wechsler and Company
Suite 300, Denrike Building
Washington 5, D. C.

Re: Docket No. DMEA-3727 (Uranium)
Santa Fe Uranium Company, Inc.
Santa Fe Tracts
McKinley County, New Mexico

Dear Mr. Wechsler:

This will acknowledge your letter of September 30, 1955, directed to Mr. Fred M. Murphy of the Rare and Miscellaneous Metals Division of this Agency.

It is noted that the Federal Uranium Corporation, of which the Santa Fe Uranium Company is a wholly-owned subsidiary, has decided not to proceed with the subject application because of the advanced stage of the development work and drilling which the company has accomplished.

Accordingly, we have removed the application from our active file and have closed the docket.

Sincerely yours,
C. O. Mittendorf

Administrator

FMMurphy/gla
10-3-55
cc to: Admr.'s Reading File
Docket
Messrs. JECrawford, Rm. 3641
THKiilsgaard, Rm. 5224
JOHosted, Rm. 3210, GSA
Code 700
Mr. Murphy
DMEA Field Team, Region III (2)

10/3/55 gla

WECHSLER AND COMPANY
ACCOUNTANTS, AUDITORS AND TAX CONSULTANTS
SUITE 300, DENRIKE BUILDING
WASHINGTON 5, D. C.

EXECUTIVE 3-5515

September 30, 1955

Mr. Fred M. Murphy
Defense Minerals Exploration Administration
Room 4449
Interior Building
Washington, D. C.

Re: Santa Fe Uranium Company
Docket No. 3727

Dear Mr. Murphy:

It is with regret that I must inform you that Federal Uranium Corporation, of which Santa Fe Uranium Company is a wholly owned subsidiary, has made a determination not to accept the DMEA loan which is processed and available for Santa Fe Uranium Corporation.

The reason that corporation cannot accept the loan is because the advanced stage of the development and the amount of drilling done by the company has changed the circumstances under which a DMEA application was filed. The corporation and myself want to thank you for all the courtesies and kind considerations your office and yourself have extended us in regard to this loan application.

Sincerely yours,

WECHSLER AND COMPANY

Nathan Wechsler

Nathan Wechsler, C.P.A.

NW/mja

9/16/55 gla

RECEIVED
SEP 16 1955

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

September 16, 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 3727, Santa Fe Uranium Company, McKinley County, New Mexico

I have reviewed the Field Team report of examination, Santa Fe Uranium Company, DMEA Docket 3727; and I have discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

The Santa Fe Uranium Company, Inc. originally requested DMEA aid for exploration for uranium on their property in McKinley County, New Mexico by 39,190 feet of core drilling in the amount of $222,321.00. After the Field Team examination and recommendation, the applicant consented to a modified two-stage program consisting of 11,475 feet of dry rotary drilling at an estimated total cost of $15,179.00.

The field examiners conclude that geologic features lend support to the belief that the exploration program outlined will be successful, and the examiners recommend that DMEA participate in the cost of the modified exploration plan.

We concur in the recommendation that approval be granted for a modified program for drilling of SW ¼ of Sec. 18, T. 13 N., R 10 W. This program is to consist of 11,475 feet of rotary dry drilling at a total estimated expenditure of $15,179.00, with Government participation at 75 percent of the total.

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

James Paone
for John E. Crawford

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

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John E. Crawford

DRAFT
9/13/55
FMMurphy/gla

Docket

MF-200
(Revised June 1954)

Docket No. DMEA 3727

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] Santa Fe Uranium Company, Inc. c/o Nathan Wechsler, whose mailing address is 1010 Vermont Avenue, N. W. Washington, D. C., 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 3

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 New Mexico, County of McKinley, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] Lessee of [5] 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] see Annex I, [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: See Annex I

(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: Performance Bond for $10,272.00

(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 April 15, 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 $ 13,696.00. The Government shall contribute 75 percent of the allowable costs as they are incurred in a total sum not in excess of $ 10,272.00: *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.

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.*—

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By .....

.....
(Operator)

By .....

.....

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

DRAFT
FMMurphy/gla
9/13/55

EXPLORATION PROJECT CONTRACT
SANTA FE URANIUM COMPANY, INC.
DOCKET NO. DMEA-3727

ANNEX I

The land referred to in Article 2 of the contract form comprises the S.W. ¼ of Sec. 18, T. 13 N., R. 10 W., N.M.P.M., McKinley County, New Mexico.

The property, consisting of 163.38 acres, is Navajo Indian allotted land leased to Brown Vandever, Allottee 077031, who assigned the lease to Glenn D. Williams and J. T. Hutton, on June 7, 1951. J. T. Hutton and wife assigned their interest to Glenn Williams, January 26, 1953. Glenn Williams assigned lease to Santa Fe Uranium Company on June 23, 1954.

EXPLORATION PROJECT CONTRACT
SANTA FE URANIUM COMPANY, INC.
DOCKET NO. DMEA-3727

EXHIBIT "A"

Description of the Work

The object of this project is to explore the Jurassic Todilto limestone, underlying the subject property, by means of rotary drilling. It is estimated that drill holes averaging 85 feet in depth will be required to penetrate this ore-bearing limestone, which ranges from 10 to 35 feet in thickness.

The work shall be divided into two stages. The operator shall complete all the work in Stage I and so much of Stage II as is approved in advance in writing by the Government.

STAGE I

Stage I shall consist of drilling not in excess of 83 holes totaling approximately 7,055 feet. The approximate locations of the drill holes are shown on attached map entitled "Figure 3 - Map Showing Mine Workings, Old Holes, And Proposed Holes of Santa Fe Uranium Co., - - - - -." The holes shall be drilled along 8 east-west trending lines spaced about 200 feet apart. The interval between holes on their respective lines shall be 100 feet. The holes along successive lines shall be staggered. The southernmost line shall be about 150 feet north of the southern boundary of Sec. 18. The end holes in alternating lines shall be about 150 feet and 200 feet east of the western boundary of Sec. 18.

If the drill footage estimated for Stage I drilling is not sufficient to complete the 83 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.

Not in excess of 50 samples shall be chemically analyzed for their U_3O_8 content under this Stage I of the contract.

STAGE II

Stage II shall consist of drilling not in excess of 52 offset holes, aggregating not in excess of 4,420 feet of rotary drilling. The offset holes shall be drilled not closer than 50 feet N. 45° W., N. 45° E., S. 45° W., and S. 45° E. from any mineralized hole discovered in Stage I drilling.

No hole drilled under Stage II shall be closer than 50 feet to any previously drilled hole.

Not in excess of 40 samples shall be chemically analyzed for their U_3O_8 content under this Stage I of the contract.

General Provisions

A geologist-mining engineer and one helper shall be employed full time under this contract.

All holes shall be cased, or drilled wet using drilling mud (Aguagel, Silvacel, or any other type of sealing additive) through the overburden and unconsolidated rocks. From about 20 feet above the estimated top of the Todilto limestone, the hole will be drilled dry until it penetrates at least 5 feet into the underlying Entrada sandstone. However, if cuttings from the hole, at this depth, register

0.02 percent eU_3O_8 or more on a Geiger instrument used to check the return air stream, then the hole shall be continued until the instrument registers less than 0.02 percent eU_3O_8.

Starting from a point in the drill hole not lower than 10 feet above the estimated top of the Todilto, all cuttings will be tested by placing a Geiger tube in the return air stream at the mouth of the drill hole.

When the Geiger instrument registers 0.02 percent eU_3O_8 or more, samples shall be collected at each 1-foot interval. All samples collected shall be checked radiometrically in the field. Every tenth sample registering in excess of 0.02 percent eU_3O_8 shall be chemically analyzed to verify the results of the radiometric analysis.

One-half of all samples that are assayed, radiometrically or chemically, shall be properly identified as to hole number and depth represented, and then stored for Government use.

All drill holes shall be logged radiometrically as soon as completed.

The Operator, together with his monthly report, shall submit a map of the property showing the location of all holes drilled with their collar elevations and depths indicated; also, copies of the driller's logs and results of sample analyses.

The Government will not contribute to the cost of any hole which does not penetrate the Todilto limestone or to any hole which cannot be probed with radiometric logging equipment.

The supervision, the extent and method of sampling, the location of drill holes, and the drilling method used are all subject to Government approval.

	Costs	
Independent Contracts, 1/ Category (1)		
11,475 feet of rotary drilling @ $0.80/ft. (includes casing or use of drilling mud)	$9,180.00	
Fixed Unit Costs		
Incidental allowance 2/ for each foot of drilling completed, 11,475 feet @ $0.37/ft.	4,245.75	
Chemical analyses for U_3O_8,		
90 samples @ $3.00 each	270.00	
Total Estimated Cost of Project (rounded)		$13,696.00
Government Participation @ 75%		$10,272.00

1/ Categories (2) through (7) do not apply to this contract.
2/ Includes all costs whatsoever that are not included in the estimates for "Independent Contracts" and analyses of samples, and includes such items as supervision, labor, payroll taxes, materials, supplies, rental of radiometric logging equipment, etc., which would otherwise be allowable under Categories (2) through (7) of the contract form.

Ind. Contrac + Unit:

Costs:

#3 holes, avg 88' = 7055' @ $0.80 =
#32 " " " = 4420' @ 0.80 =

Total. 11475' = 115'/day (* 4 corners figure)
100 days
= 4 months

Supt. 4 months @ $500/mth = $2000.00
Asst/pe 4 " @ $350/mth = 1400.00
Taxes, etc. 5% of $3400 170.00
3000 paper sample sacks 30.00
Acct. 4 mths @ $50/mth 200.00
Rental radiometric logging equip 4 months @ $100/mth 400.00
$4200.00 / 11475' = $0.366

Independent Contractor Costs
11475' rotary drilling @ 0.80/ft
(includes casing or use of drilling muds.) $9180.00

Fixed Unit Costs
Incidental allowance for each foot of drilling completed,
11475' @ $0.37/ft 4245.75
Chemical analyses for lab
90 @ $3.00 each 270.00
(rounded) $13,696.00
75% $10,272.00
$1.20/ft

9/8/55 gla

IN REPLY REFER TO:

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

RECEIVED

September 8, 1955

Re: DMEA 3727
Santa Fe Uranium Company
Santa Fe Tracts
McKinley Co., N. M.
$15,215.00 - Uranium

Memorandum

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

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

Subject: Review of Field Team Report.

The application asked for assistance in doing 39,190 feet of core drilling at an estimated cost of $222,321.00. The examiners and Field Team scaled the proposal to one calling for 2 stages of dry drilling, 11,475 feet, at an estimated cost of $15,215.00.

The subject property is without doubt underlain by the Todilto limestone, the host rock of the producing deposits in the immediate area, although there are no known outcrops of the formation on the property.

Because of known ore on the property and large orebodies on near-by claims part of the SW-1/4 of Section 18 is considered favorable ground for uranium mineralization and worthy of drilling. The examiners and Field Team recommend Government participation in such drilling.

I concur with the acceptance recommendation of the Field Team.

N. E. Nelson

N. E. Nelson

IN REPLY REFER TO:

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

September 8, 1955

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I concur with the acceptance recommendation of the Field Team.

N. E. Nelson

NENelson:iml
G-9/8/55

N. E. Nelson

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

IN REPLY REFER TO:

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

September 8, 1955

Re: DMEA 3787
Santa Fe Uranium Company
Santa Fe Tracts
McKinley Co., N. M.
$15,215.00 - Uranium

Memorandum

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

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

Subject: Review of Field Team Report.

The application asked for assistance in doing 39,190 feet of core drilling at an estimated cost of $282,321.00. The examiners and Field Team scaled the proposal to one calling for 2 stages of dry drilling, 11,475 feet, at an estimated cost of $15,215.00.

The subject property is without doubt underlain by the Todilto limestone, the host rock of the producing deposits in the immediate area, although there are no known outcrops of the formation on the property.

Because of known ore on the property and large orebodies on near-by claims part of the SW-1/4 of Section 18 is considered favorable ground for uranium mineralization and worthy of drilling. The examiners and Field Team recommend Government participation in such drilling.

I concur with the acceptance recommendation of the Field Team.

N. E. Nelson

N. E. Nelson

NENelson:iml
G-9/8/55

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

IN REPLY REFER TO:

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

September 8, 1955

Re: DMEA 3787
Santa Fe Uranium Company
Santa Fe Tracts
McKinley Co., N. M.
$15,215.00 - Uranium

Memorandum

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

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

Subject: Review of Field Team Report.

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The subject property is without doubt underlain by the Todilto limestone, the host rock of the producing deposits in the immediate area, although there are no known outcrops of the formation on the property.

Because of known ore on the property and large orebodies on near-by claims part of the SW-1/4 of Section 18 is considered favorable ground for uranium mineralization and worthy of drilling. The examiners and Field Team recommend Government participation in such drilling.

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N. E. Nelson

NENelson:iml
G-9/8/55

N. E. Nelson

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

9/6/55 glu

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

RECEIVED SEP - 2 1955

224 New Customhouse
Denver 2, Colorado

August 29, 1955

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Report of Examination, DMEA Docket 3727, (Uranium), Santa Fe Uranium Company, McKinley County, New Mexico

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

We concur in the recommendation of the field examiners that a contract be approved for a two stage drilling program as outlined in the report.

The contract should provide for the use of casing or some other means of preventing the unconsolidated overburden from diluting the samples.

The operator should be required to provide a map of such scale as to distinctly show the boundaries of his land in Section 13, and the location of all holes with their collar elevations and depths. A copy of this map together with the drillers logs and results of sample analsis should accompany the Forms MF-104 each month.

The bids from three contractors requested in your letter of April 6, 1955 were not forwarded this office. The estimated cost of drilling at $3.80 per foot appears very reasonable. If the three bids you requested are still necessary, we will be glad to request them from the applicant.

Nathan Wechsler, Attorney, 1010 Vermont Avenue, N.W., Washington D. C. has been pushing this application. He has also represented other applicants including Utah Premier Uranium Company who have recently requested that their contract be rescinded.

Contract Maps not forwarded!

DMEA Field Team, Region III

W. M. Traver

W. M. Traver

for D. R. McLaren

E. M. Harshman

Enclosures

DMEA
Date Rec'd.

AUG 26 1955

BUREAU OF MINES
Denver, Colorado

RECEIVED
SEP 1955

Region III

Building 20
Denver Federal Center
Denver 2, Colorado
August 26, 1955

Memorandum

TRANSMITTED

AUG 29 1955

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shaw

Subject: DMEA 3727 (Uranium) Santa Fe tracts, Santa Fe Uranium Company, Inc., McKinley County, New Mexico

Enclosed are the original and ten copies of a "Joint Summary, Conclusions, and Recommendations", by Donald Haynes, Geologist, and Glen Walker, Mining Engineer, and the original and ten copies of an Engineering Report by Glen Walker, Mining Engineer, covering docket DMEA 3727.

The Santa Fe Uranium Company requested Government assistance in the amount of $222,321.00 to explore their property in McKinley County, New Mexico, by 39,190 feet of core drilling. A field examination was made on April 26, 1955. The examining team recommended a modified program consisting of 11,475 feet of dry rotary holes at an estimated cost of $15,179.00. This program was approved by the company representative.

It is recommended that a contract consisting of two stages of dry rotary holes be approved. The first stage would consist of 83 holes averaging 85 feet in depth making a total footage of 7,055 feet. Stage 2 would be dependent upon the results of Stage 1 and would consist of 52 holes offsetting mineralized holes encountered in Stage 1. Stage 2 would require the prior approval of the DMEA Field Team. The contract should provide for the transfer of footage and money from one stage to the other.

John F. Shaw
John F. Shaw
Supervising Mining Engineer

Enclosures

cc 10
Hillerslunden
DMEA 3727
Chron

JFS/em

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

RECEIVED
SEP 1955

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 3727, Santa Fe tracts

Santa Fe Uranium Company, Inc.

McKinley County, New Mexico

Uranium

Donald Haynes, Geologist
Geological Survey

Glen Walker, Mining Engineer
Bureau of Mines

August 1, 1955

DMEA 3727

RECEIVED
SEP - 1955

SANTA FE TRACTS
SANTA FE URANIUM COMPANY, INC.
McKINLEY COUNTY, NEW MEXICO

Joint Summary, Conclusions, and Recommendations

by

Donald Haynes, Geologist
Geological Survey

Glen Walker, Mining Engineer
Bureau of Mines

DMEA 3727

SANTA FE TRACTS
SANTA FE URANIUM COMPANY, INC.
McKINLEY COUNTY, NEW MEXICO

JOINT SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Donald Haynes and Glen Walker

The Santa Fe Uranium Company requested Government assistance in the exploration for uranium ore on two separate 1/4 sections of Indian allotment land in McKinley County, New Mexico. They proposed 39,190 feet of core drilling in an undisclosed number of holes at a cost of $222,321.00. $5.6729 /ft.

A DMEA field examination was made on April 26, 1955, by T. E. Mullens and Donald Haynes of the U. S. Geological Survey and Glen Walker of the U. S. Bureau of Mines in company with Thomas Fife for the company.

It was concluded that a portion of the ground merits exploration because of its proximity to the large deposit of Haystack Development and Mining Co. (Santa Fe R.R.) and the number of favorable holes previously drilled. There was also a small production of ore from this particular 1/4 section. A program considerably modified as compared to the original was suggested by the examining team and approved by the company's representative, Mr. Fife.

It is recommended that DMEA participate in the cost of drilling 11,475 feet of dry rotary holes in the SW1/4 sec. 18, T. 13 N., R. 10 W., at an estimated expenditure of $15,179.00.

DMRA 3727

SANTA FE TRACTS
SANTA FE URANIUM COMPANY, INC.
MCKINLEY COUNTY, NEW MEXICO

Engineering Report

Glen Valley, Mining Engineer
Bureau of Mines

DMEA 3727

SANTA FE TRACTS
SANTA FE URANIUM COMPANY, INC.
McKINLEY COUNTY, NEW MEXICO

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3. Map showing mine workings, old holes and proposed holes of Santa Fe Uranium Co., property in SW1/4 sec. 18, T. 13 N., R. 10 W., McKinley County, New Mexico..... 6

DRAFT

SANTA FE TRACTS
SANTA FE WESTERN COMPANY, INC.
McKINLEY COUNTY, NEW MEXICO

ENGINEERING REPORT

By

Glen Walker

INTRODUCTION

The Santa Fe Western Company, Inc., a Utah corporation, made application to the DMEA for assistance in the exploration for uranium ore on two 1/4 sections of Indian allotment land in SW/4 sec. 18, T. 13 N., R. 20 W., and NE/NW/2 sec. 13, T. 13 N., R. 21 W., New Mexico principal meridian in McKinley County, New Mexico. The work outlined in the application included 58 Phase I and II holes and an unestimated number of Phase III holes. The holes were to be plug drilled through the overburden to the Todilto limestone, then cored through the limestone ore horizon. The total proposed footage was 30,100 feet and the project was estimated to cost $282,321.00.

An examination of the properties by a Region III DMEA examining team was made on April 26, 1955.

A modification of the applicant's proposal was agreed upon by the company's representative and the members of the examining team. The acceptable program consists of two stages of dry drilling through the Todilto formation; the first includes 65 holes in east-trending rows 200 feet apart with the holes 100 feet apart and staggered in the rows; the second phase would use 58 holes arranged around first stage abandoned

or indicative holes. All drilling is to be done in the SW1/4 sec. 18, T. 13 N., R. 10 W. The total project would entail 11,475 feet of drilling at an estimated cost of $15,215.00.

ACKNOWLEDGMENT.

Thomas Fife, mine superintendent for the company, guided the examining team and furnished pertinent information on the subject and adjoining properties. The application has been discussed with the Exploration Division of AEC in Grand Junction, Colo.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The land mentioned in the application is in two 160-acre plots, the N1/2N1/2 sec. 13, T. 13 N., R. 11 W., and the SW1/4 sec. 18, T. 13 N., R. 10 W., New Mexico principal meridian. Sec. 18 can be reached by travelling about 9 miles, almost due north, along a newly constructed gravel road from Blue Water, New Mexico; the site of the Anaconda Copper Co. uranium mill. Blue Water is also the nearest rail point (see fig. 1). The property in sec. 13 is on the north side of Haystack Butte and is reached by a rough trail built, for the most part, along a ledge around the south and west ends of the butte; it is about 2 miles from the ground in sec. 18 (see fig. 2).

Both quarter sections are relatively flat to gently rolling. The north one-fourth of SW1/4 sec. 18, however, is part of the abrupt south side of Haystack Butte, the top of which is 700-800 feet above the surrounding surface. Likewise the extreme east end of the subject land in sec. 13 is included in a high spur of the butte. Although neither area has much relief, that in sec. 13 is about 200 feet higher than the SW part of sec. 18.

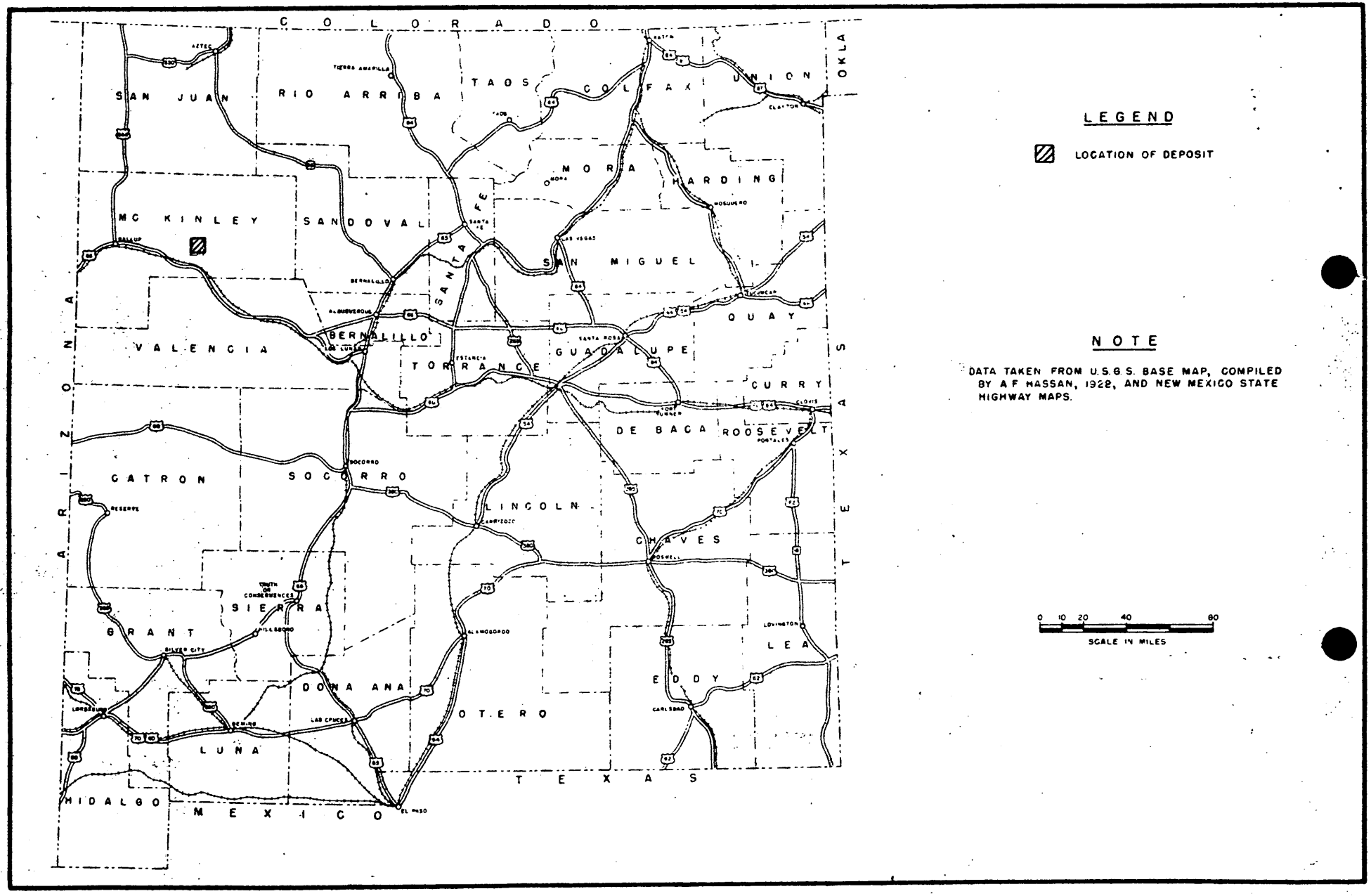

FIGURE 1 - LOCATION MAP OF SANTA FE URANIUM CO., PROPERTY IN McKINLEY COUNTY, NEW MEXICO. DMEA 3727

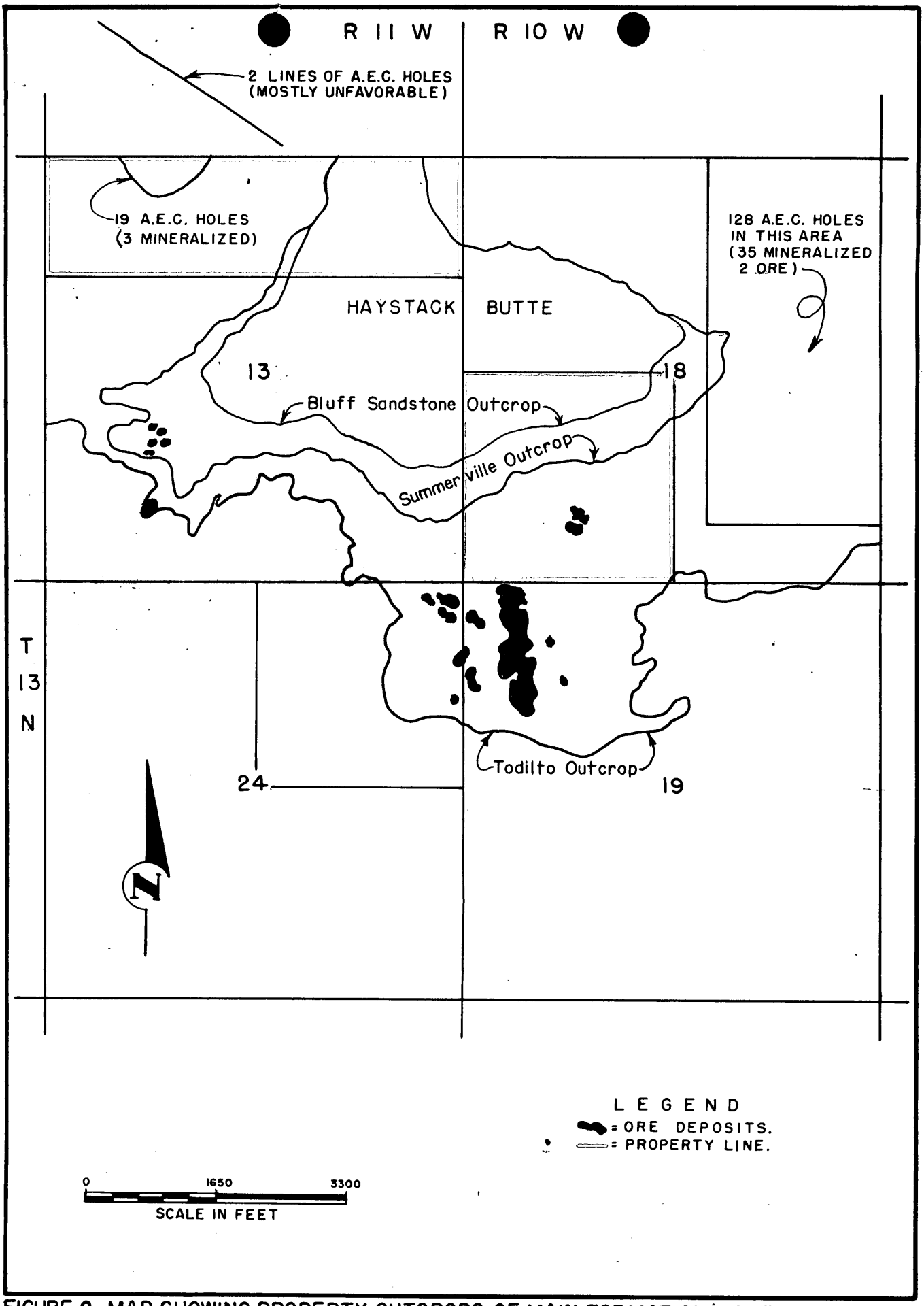

FIGURE 2-MAP SHOWING PROPERTY, OUTCROPS OF MAIN FORMATIONS, ORE DEPOSITS AND AREAS OF A.E.C. DRILLING, SANTA FE URANIUM CO., McKINLEY COUNTY, N.MEX. DMEA 3727

The surface of both plots is covered with a sparse to fair growth of cedar and pinon, which would have only a limited application to a mining operation. Dimension lumber may be obtained from small saw mills on the flanks of Mt. Taylor, about 20 miles NE.

Water is at a premium in the district generally. Most of it for mining, drilling and domestic use must be hauled from agricultural wells and ponds in the vicinity.

Indians are used as common labor but experienced underground miners are rather difficult to obtain and command a high wage. Thomas Fife, the superintendent for Santa Fe Uranium Co., Inc., appears to be capable of handling any anticipated exploration or mining project on the property.

Power, for any type operation, must be supplied by internal combustion engines as public utilities are not presently available in the mining district.

HISTORY, PRODUCTION, AND OWNERSHIP

Uranium ore was first discovered in the area in 1950 on sec. 19, T. 13 N., R. 10 W., owned by the Santa Fe R.R. This deposit is estimated to have contained 126,000 tons and has produced about 30,000 tons of approximately .20 percent U_3O_8 ore. From the NE1/4 of sec. 24, T. 13 N., R. 11 W., the Santa Fe Uranium Co., Inc., has reportedly produced about 20,000 tons of ore averaging .20 percent U_3O_8. The SW1/4 of sec. 18, T. 13 N., R. 10 W., is reported to have produced 4,100 tons of .14 percent U_3O_8 ore from underground operations.

All the subject property is Indian allotment land and was originally located by Glenn Williams and J. T. Hutton from Brown and Walter Vanlover (Navajo Indians) in June 1951. Hutton assigned his equity to Williams but retained a 2 percent royalty on ore production. Williams made a sale agreement in May 1954 with Santa Fe Uranium Company, Inc., for his interest in the property.

DESCRIPTION OF DEPOSITS

All the producing deposits of the immediate area have been found in the Jurassic Todilto limestone. This formation lies above the Entrada and below the Summerville and although it is quite thin (10-25 feet) it is very persistent in lateral extent. The Todilto does not crop out on the subject ground but is known to exist from numerous drill holes and underground workings. Haystack Butte, the most prominent topographic feature in the neighborhood, has exposures of rocks from the Cretaceous Dakota to the Jurassic Summerville, and about 3/4 mile south the Entrada and Todilto crop out. The broad bench on the south side of the Butte is covered principally by unconsolidated sand. Similar conditions exist on the north side of Haystack.

All the known ore bodies in the general area appear to have a considerable range in size, shape, attitude and to a less extent grade. The largest (120,000 tons) is also the most regular and has a definite north strike; whereas many of the smaller ones appear to have more easterly trends. This inconsistency in strike may be due to prominent rock jointing in certain directions. Likewise the shape, which varies from kidney-like to very narrow and sinuous, may have been affected by certain

rock structures existing before ore deposition. The ore is in general parallel to the dip of the rock formation (3-6 degrees NE) but locally it is in steep veins or mineralized which have a harmful effect on the mining operation. Some open-pit mine practice includes probing of blast holes to determine as exactly as possible the top of the ore and the blasting of appreciable amounts of overlying waste material separately. The grade, here as in most uranium deposits now worked, ranges from the bare minimum allowable to considerably over 1 percent U_3O_8. Most mine operators in the area attempt to hold a shipping grade of .2 percent U_3O_8. This fact indicates the deposits are of much higher grade than .2 percent because their thickness (10 inches to 4 feet) makes dilution practically unavoidable. Very little mineralized rock was noted in the walls of abandoned pits as deposits in the Bedlite limestone appear to have rather sharp lateral cut-offs.

MINABLE ORE RESERVES

Although the applicant states no reserves exist the work in progress at the underground mine in one. It is directed toward the development of a roughly triangular area 190 feet by 150 feet southeast of the shaft in which seven holes indicated an average of 2.1 feet of material assaying 0.266 percent U_3O_8. It is estimated that the ore in this area has a gross value at least of $135,000.00. There is also a much smaller area northeast of the shaft that perhaps contains a few tons of slightly over 0.2 percent U_3O_8 rock. In proximity to to the shaft there appears to be approximately 5,000 tons of rock that can be converted at a small unit profit.

PRESENT STATUS

There is no milling equipment on the property but the mining machinery includes an Allis-Chalmers HD-20 tractor with dozer blade, two Allis-Chalmers HD-5 tractors with front-end loaders, a 150-c.f.m. Sullivan portable air compressor (all new), three pneumatic leg feed jackhammers, one unmounted jackhammer, one 315-c.f.m. Sullivan air compressor and wagon drill mounted on a Chevrolet truck, one 315-c.f.m. Joy portable air compressor and wagon drill, one single drum hoist and miscellaneous small tools and equipment (all used).

The present company and previous lessees have done considerable mining and exploratory drilling on the NW/4 of sec. 18; little work, other than RCD drilling, has been done on the company's land in sec. 13. On the subject land in sec. 18, a 20-degrees inclined shaft encountered a deposit of uranium about 45 feet below the surface which produced about 4,200 tons of .14 percent U_3O_8 ore. The stope or room that resulted from this production has caved but presently a drift is being driven from the bottom of the shaft in a southwesterly direction to another ore body discovered by closely spaced wagon drill holes. Another small deposit is thought by the operator to exist in the vicinity of the shaft to the northeast. His conjecture is based upon a number of reportedly abandoned holes drilled by a former lessee to satisfy stipulations of the lease.

According to data received from the applicant since the field examination 80 holes have been drilled in the NW/4 sec. 18, 15 of which had ore showings ranging from 2 feet of 0.17 percent U_3O_8 to 2 feet of 0.40 percent U_3O_8, see figure 3.

The applicant proposed drilling 21 plug and core bit holes on 1,000-foot centers followed in the second stage by 37 holes arranged midway between the first ones. He estimated a total of 39,200 feet, 1,760 feet of which would be cored at a cost of $232,321.00, or about $5.67 per foot.

The negative results of the AEC drilling in the north part of sec. 13, T. 13 N., R. 11 W., and adjoining land eliminates this area from consideration at this time.

The applicant's representative, Thomas Fife, agreed with the examining team's program which is as follows:

Stage I, 5 rows of east-trending holes with 100 foot between holes and 200 foot between rows; the holes to be staggered in the rows. This stage would require 42 holes averaging 45 feet in depth making a total footage of 7,855 feet.

Stage II would consist of 52 holes arranged in sets of 4 and 50 feet from mineralized holes encountered in Stage I. It is estimated this stage would require a total footage of 4,420 feet. All holes are to be drilled through the Tuolite formation dry and samples caught at intervals of at least 2 feet. The samples should be tested by a Geiger counter or scintillometer and those that answer should be analyzed chemically for U_3O_8. Also the samples should be split, sealed and the seals marked with the hole number and the depth. One split of each sample should be kept for the Government's use, the other for analysis or such use as the applicant deems necessary. The unconsolidated nature of the overburden will doubtless necessitate the use of casing or some means of preventing

caving of the holes while drilling and sampling. The first hole of Stage I should be located 150 feet east and 150 feet north of the southwest corner of sec. 18. No hole should be drilled more than 5 feet below the bottom of the Tadilto limestone formation.

The applicant would be required to make a map of such scale as to distinctly show the boundaries of his land in sec. 18, and the location of all holes with their collar elevations and depths. A copy of this map along with driller's logs and results of sample analysis should accompany the MP-101 forms each month. The proposed project should be completed in 6 months.

Stage I

Exploration contracts

60 dry holes totaling 7,025 feet at $.60 per foot (including casing)		$3,411.00

Labor, supervision, and technical services

1 geologist-engineer at $500.00 per month for 3-1/2 months	$1,750.00	
1 engineer's helper at $350.00 per month for 3-1/2 months	1,225.00	
Total		2,975.00

Expendable materials and supplies

3,000 paper sample sacks	30.00

Operating equipment

None

Rehabilitation

None

New facilities and improvements

None

Miscellaneous

Workmen's compensation, social security taxes, etc., on engineer's and helper's salaries, 5 percent of $2,975.00	$255.00	
Accounting at $50.00 per month for 3-1/2 months	148.75	
Chemical analysis, 50 at $3.00 each	150.00	
Total		$ 553.75

Total cost of Stage I $9,202.75

Cost per foot for drilling without analyses = $1.28+

Stage II

Independent contracts

52 dry holes totaling 4,420 feet at $0.80 per foot (includes casing)		$3,536.00

Labor, supervision and technical services

1 geologist-engineer at $500.00 per month for 2-1/2 months	$1,250.00	
1 engineer's helper at $350.00 per month for 2-1/2 months	875.00	
Total		$2,125.00

Operating materials and supplies

None

Operating equipment

None

Rehabilitation

None

New buildings and improvements

None

Miscellaneous

Workman's compensation, social security taxes, etc., on engineer's and helper's salaries, 5 percent of $2,126.00	$106.35	
Accounting, at $50.00 per month for 2-1/2 months	125.00	
Chemical analysis, 40 at $3.00 each	120.00	
Total		$ 351.35

Total cost of Stage II $4,012.25

Cost per foot for drilling without analyses = $1.33

SUMMARY OF PROJECT COSTS

Phase	Footage	Duration	Estimated cost per foot	Analyses	Total cost
I	7,055	3-1/2 months	$1.30	$150.00	$ 9,180.40
II	4,420	2-1/2 months	1.33	120.00	5,998.60
Totals	11,475	6 months			$15,179.00

CONCLUSIONS

As shown on figure 2 of the geologic report there appears to be a northward trend to the Tonilite ore zone which extends into the SE/4 of sec. 18, T. 13 N., R. 10 W. This encouraging feature coupled with the fact that ore has been produced and the anticipation of more production lend support to the belief that the exploration program outlined will be successful.

RECOMMENDATIONS

It is recommended that DMEA participate in the cost of exploration as outlined.

/ss

DMEA
IN REPLY REFER TO:
Date Rec'd.
JUL 20 1955
BUREAU OF MINES
Denver, Colorado

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

July 20, 1955

TRANSMITTED
AUG 29 1955

Memorandum

To: DMEA Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3727 (Uranium), Santa Fe Uranium Company, McKinley County, New Mexico

Enclosed are 10 copies of a geologic report, and 9 extra copies of the included maps, by D. D. Haynes, U. S. Geological Survey, covering an examination of the subject property.

The examining team revised the program originally proposed by the applicant to include more intensive exploration in the geologically favorable portion of the property. The applicant's engineer has approved the revised program.

Factual data is presented in the report to substantiate the conclusion that exploration on the property is warranted and the proposed program appears satisfactory.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (19)

ENHarshman:arh

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

RECEIVED
SEP - 8 1955

DMEA
Date Rec'd.
JUL 20 1955
BUREAU OF MINES
Denver, Colorado

July 14, 1955

TRANSMITTED
AUG 29 1955

Memorandum

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

From: J. William Hasler

Subject: DMEA 3727, Santa Fe Uranium Company, Grants District, McKinley County, New Mexico

The Santa Fe Uranium Company applied for assistance to explore for uranium in the Todilto limestone, Grants District, McKinley County, New Mexico.

The property was examined on April 26, 1955, by a Region III examing team composed of Glen Walker, U. S. Bureau of Mines; D. D. Haynes and T. E. Mullens, U. S. Geological Survey. The examining team was accompanied by Tom Fife, engineer for Santa Fe Uranium Company.

The ~~Field~~ Examining Team recommended that the original proposal be revised and it was necessary to await the arrival of additional material from the Operator and to obtain his concurrence of the revised exploration program.

The Grants uranium mining district is on the north flank of the Zuni Uplift, a broad, elongated asymmetrical dome trending in a northwest direction. The rocks exposed in the vicinity of the Santa Fe Uranium Company's property are the Jurassic Entrada sandstone, Todilto limestone, Summerville formation, Bluff sandstone, Morrison formation, and the Cretaceous Dakota sandstone. The Jurassic Todilto limestone overlies the Entrada sandstone and is the principal uranium-bearing formation on the subject property.

The ore deposits in the immediate area of the subject property range in size from 500 to tens of thousands of tons. The deposits are elongate mineralized masses, the majority of which have a trend slightly west of north, but a few have a random orientation.

There has been considerable production from other properties in the general area of the Santa Fe Uranium Company's property. The revised plan of exploration has been approved by the applicant and it is recommended that the plan be executed in two separate stages; the first stage is to find mineralized areas; the second stage is planned to search for and find the ore bodies within the mineralized areas, as shown on the accompanying maps. Because of the geologically favorable setting north of and adjacent to ground known to contain large deposits of uranium ore, the W½, SW¼, sec. 18, T. 13 N., R. 10 W., has a good chance of containing a fairly large tonnage of uranium ore. It is, therefore, recommended that the application for DMEA assistance be approved and that the revised plan of exploration as described herein be done. I concur with the conclusions and recommendations made by the examining team.

Enclosed are 12 copies of the geologic report by D. D. Haynes, with accompanying maps and 9 extra copies. The brochure is also enclosed.

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

JWH/mlr

Enclosures

UNITED STATES DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, SECRETARY

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

DMEA 3727, Santa Fe Uranium Company
McKinley County, New Mexico

Uranium

Geologic Report

by

D. D. Haynes
U. S. Geological Survey

July 15, 1955

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INTRODUCTION

Application (DMEA 3727) has been made by the Santa Fe Uranium Company for Government assistance in exploring for uranium in the Todilto limestone, Grants district, McKinley County, New Mexico. The applicant proposes to explore the leased areas with a maximum of 39,190 feet of core and non-core drilling at a total cost of $222,321. The Government's share would be 75 percent or $166,740.75.

The property was visited on April 26, 1955, by a Region III examining team composed of Glen Walker of the U. S. Bureau of Mines and D. D. Haynes and T. E. Mullens of the U. S. Geological Survey. The examining team was accompanied by Thomas Fife, engineer, Santa Fe Uranium Company.

The field team recommends that the original proposal be revised to allow some exploration in the SW$\frac{1}{4}$, sec. 18, T. 13, R. 10 W.

On June 7 the writer conferred with Mr. Louis Garbrecht, U. S. Atomic Energy Commission, to evaluate the property.

The Santa Fe Uranium Company properties are in the SW$\frac{1}{4}$ sec. 18, T. 13 N., R. 10 W., and the N$\frac{1}{2}$, N$\frac{1}{2}$ sec. 13, T. 13 N., R. 11 W., N.M.P.M, McKinley County, New Mexico. The properties are accessible from Grants, New Mexico by traveling about 18 miles west on U. S. Highway 66 and thence about 8 miles northeast over graded dirt roads.

The area near the Santa Fe Uranium Company properties is readily accessible in dry weather, but is very muddy in wet weather. The graded road to the property is a fairly good truck road. The Anaconda buying station is located at Bluewater on U. S. Highway 66, a distance of about 10 miles from the subject property. The Atchinson-Topeka and Santa Fe railroad parallels Highway 66.

The local area is predominantly of low relief except for Haystack Butte, the top of which is about 700 feet above the surrounding bench.

The Santa Fe Uranium Company property in the SW $\frac{1}{4}$ sec. 18, T. 13 N., R. 10 W., is partly on the southeast quarter of Haystack Butte and partly on the surrounding flat bench. The Santa Fe Uranium Company property in the N$\frac{1}{2}$, N$\frac{1}{2}$ of sec. 13, T. 13 N., R. 11 W., is partly on the northwest quarter of Haystack Butte, but mostly on the surrounding bench.

GEOLOGY

The Grants uranium mining district is on the north flank of the Zuni Uplift, a broad, elongated, asymmetrical dome trending in a northwest direction. It is about 65 miles long and 40 miles wide. The strata underlying the Santa Fe Uranium Company property dip gently northeast.

The rocks exposed in the vicinity of the Santa Fe Uranium Company property are, in ascending order, the Jurassic Entrada sandstone, Todilto limestone, Summerville formation, Bluff sandstone, Morrison formation and Cretaceous Dakota sandstone. As only those formations below the Bluff sandstone are of concern with this report only the Entrada sandstone, Todilto limestone and Summerville formation will be discussed in detail. Information concerning the overlying formations may be obtained from Table 1.

The Jurassic Entrada sandstone is the lowest rock unit exposed in the area. It is predominantly a pale reddish brown to grayish orange pink fine- to very-fine grained, cross-bedded, cross-laminated sandstone.

The Jurassic Todilto limestone overlies the Entrada sandstone and is the principal uranium-bearing formation on the subject property. The upper part is a dark-gray, dense, thinly bedded limestone. The beds are well marked and show small folds or crinkles. The upper part has been recrystallized in the vicinity of uranium deposits. The lower part is a dark-gray, dense, thick-bedded, limestone containing lenses of calcareous silty sandstone. 1/

Summ
Tod
Ent

1/ Rappaport, Irving, Interim report on the Ore Deposits of the Grants District, New Mexico, U. S. Atomic Energy Commission, RMO 1031, November 1952.

The Jurassic Summerville formation overlies the Todilto limestone and is composed of reddish brown siltstone and white, very-fine to fine-grained sandstone. The Summerville formation commonly interfingers with the Todilto limestone and the contact is difficult to find. The Summerville formation forms wide flat benches and in this area is covered by wind-blown alluvium as much as 40 feet thick. Much of the Summerville formation has been removed by erosion in the southern part of sec. 18, but nearer Haystack Butte almost the complete thickness is present.

There are few faults in the immediate area of the Santa Fe Uranium Company property. There is one fault that trends southwest through Haystack Butte.

Table 1. Generalized stratigraphic section for the area in the vicinity of sec. 18, T. 13 N., R. 10 W., McKinley County, New Mexico } contract area

Age	Formational units	Lithology	Average thickness
Cretaceous	Dakota sandstone	SS	64
- - - - - - - - - - - - - - - - Unconformity - - - - - - - - - - - - - - - - - -			
	Morrison formation:		
	Brushy Basin member	MS, ST	137
	Westwater Canyon member	SS	100
Jurassic	Recapture member	SS	100
	Bluff sandstone	SS	250
	Summerville formation	SS, ST	160 ← mostly eroded on property
	Todilto limestone	LS	20
	Entrada sandstone	SS	130-230

ORE DEPOSITS

The ore deposits in the immediate area of the Santa Fe Uranium Company property range in size from 500 to tens of thousands of tons. The deposits are elongate mineralized masses, the majority of which have a trend slightly west of north but a few have a random orientation.

The deposits range in size (dimensionally) from small mineralized masses 75 feet long and 50 feet wide to large deposits such as the one on sec. 19, owned by the Haystack Mountain Development Company, which is 1250 long and 400 feet wide. These deposits are composed of numerous ore bodies which may or may not be connected by mineralized material.

The tonnage and production of some of the deposits in the vicinity of sec. 18 is as follows: The NW$\frac{1}{4}$ sec. 19, T. 13 N., R. 10 W., Haystack Mountain Development Company owner, a total tonnage of 120,000 tons of 0.25 percent U_3O_8 with 66,558 tons of 0.21 percent U_3O_8 being shipped through April 1955; from the NE$\frac{1}{4}$ sec. 24, T. 13 N., R. 11 W., owned by Santa Fe Uranium Company, 19,346 tons of 0.24 percent U_3O_8 shipped through April 1955, with present reserves of 7000 tons of 0.45 percent U_3O_8; from the SW$\frac{1}{4}$ sec. 18, T. 13 N., R. 10 W., Glen Williams, the previous lessor of the property, shipped 4,596 tons of 0.18 percent U_3O_8 through November 1953. These figures were obtained from the U. S. Atomic Energy Commission which uses an ore grade cut-off of 0.10 percent U_3O_8 one foot or more thick.

Figure 2 shows the mineralized deposits and the present status of mining operations in the immediate area of the Santa Fe Uranium Company property.

The chief ore minerals are pitchblende, tyuyamunite and uranophane. Hematite, barite, flourite, pyrite and limonite are common accessory minerals.

PROPOSED EXPLORATION

Applicant's plan of exploration

The applicant proposes the exploration in secs. 18 and 13 to be done in three stages of drilling. He proposed that stage I be done by drilling holes on a 1,000-foot grid. Those holes in the N$\frac{1}{2}$, N$\frac{1}{2}$, sec. 13 would begin 150 feet east of the west section line and 150 feet south of the north section line. Those holes in the SW$\frac{1}{4}$ sec. 18 would begin 100 feet east of

the west section line and 100 feet north of the south section line. The applicant believes that holes drilled in stage I would help establish within fairly close limits the depths where coring of the Todilto limestone should be commenced in subsequent holes. This stage I would require 21 holes for a total of 8,925 feet of drilling. Stage II drilling includes 37 holes to be drilled on a 500-foot grid pattern offsetting stage I holes. These 37 holes would require 17,205 feet of drilling. Stage III drilling is proposed to outline favorable ground with offsets as close as 50 feet, and will total about 13,000 feet.

Revised plan of exploration

From what is now known of the distribution and habits of the Todilto deposits in the vicinity of the subject area, an alternate plan of exploration is proposed that has met with the approval of the applicant.

Under this plan the SW$\frac{1}{4}$ sec. 18 is to be explored in two stages of drilling. Stage I is to find mineralized areas. Stage II is planned to search for and define the ore bodies within the mineralized areas.

Stage I drilling is planned to be done in 8 east-trending lines of holes, the lines being 200 feet apart and the holes along the lines 100 feet apart. The holes along successive lines should be staggered to be most effective. This pattern of drilling is based on finding and outlining the minimum-sized mineralized areas. The minimum-sized mineralized area appears to be about 75 feet long and 50 feet wide. The end holes in alternating lines should be about 150 feet and 200 feet from the western boundary of sec. 18. The southernmost line should be about 150 feet from the

southern boundary of sec. 18. No hole proposed by DMEA in stage I should be closer than 50 feet to any hole previously drilled on the property. In so far as possible, the drilling should proceed from south to north in order to make use of the greatest amount of available information. Stage I will require 83 holes averaging 85 feet for a total of 7,055 feet.

Stage II drilling should be done to find and roughly outline the ore bodies within the mineralized areas. These holes should be drilled 50 feet N. 45° W., N. 45° E., S. 45° W., and S. 45° E., from any mineralized hole discovered in stage I drilling. No offset hole should be closer than 50 feet to any hole previously drilled on the applicant's property. Stage II will require about 51 holes averaging 85 feet for a total of 4,335 feet. No offset hole in stage II should be closer than 50 feet to any other hole drilled in stage I or stage II. Stages I and II will necessitate 134 holes with a maximum of 11,390 feet of drilling. No hole should be collared above the Summerville formation due to the increased drilling depth to the Todilto limestone.

Suggestions for sampling.

The general drilling practice in the Grants area is to do rotary plug-bit drilling with water. This method keeps the overburden and unconsolidated rocks from caving into the holes. That part of the hole below the plug-bit zone, say 20 feet above the estimated top of the Todilto limestone should be drilled with air.

Mr. L. S. Hilpert, district geologist for the Grants area, U. S. Geological Survey, suggests the following plan of sampling:

a) The operator is to place a geiger tube in the return air stream at the mouth of the drill hole when the base of the hole is near the ore zone, say 10 feet above the estimated top of the Todilto.

b) When the geiger instrument registers 0.02 percent eU_3O_8 or more, have the operator immediately start collecting samples for each 1 foot interval until the base of the Todilto is reached. If the last sample registers 0.02 percent eU_3O_8 or more, have samples continue to be taken until the anomaly is less than 0.02 percent eU_3O_8.

c) All samples collected should be checked radiometrically in the field. When they register 0.02 percent eU_3O_8 or more, they should be split and one-half the split be assayed in the radiometric lab. Every tenth sample assayed radiometrically should also be assayed chemically to verify the results of the radiometric analysis.

d) The other half of the splits of all samples that are assayed in the lab, radiometrically or chemically, be packaged and stored until picked up by the examining team.

e) The hole should be logged radiometrically as soon as completed so as to lessen the chance of contamination from radon gas and the results from this logging should be compared with the results of the radiometric and chemical assays.

All holes will be bottomed 5 feet into the underlying Entrada sandstone unless the samples being collected register 0.02 percent eU_3O_8 or more on the geiger instrument used to check the return air stream at which time the hole will be continued until the geiger instrument registers less than 0.02 percent eU_3O_8.

RECOMMENDATIONS AND CONCLUSIONS

Because of the geologically favorable setting north of and adjacent to ground known to contain large deposits of uranium ore, the W½, SW¼ sec. 18, T. 13 N., R. 10 W., has a good chance of containing a fairly large tonnage of uranium ore. The E½ SW¼ sec. 18 will not be explored at this time due to the greater drilling depth and to the fact it is lying north of an area considered not favorable for ore deposition. The N½, N½, sec. 13, T. 13 N., R. 11 W., is considered unfavorable, for the localization of ore deposits by the U. S. Atomic Energy Commission, which has drilled a number of holes in that area. Also the depth through the Todilto limestone is about 250 feet in sec. 13 and it would not be economical to drill at such depths for the minimum-sized ore deposits.

The plan for exploration is a modification of the one originally proposed by the applicant. The modified plan has the complete agreement of the applicant's engineer. It is, therefore, recommended that DMEA assistance be provided to explore the W½ SW¼ sec. 18 as outlined in this geologic report.

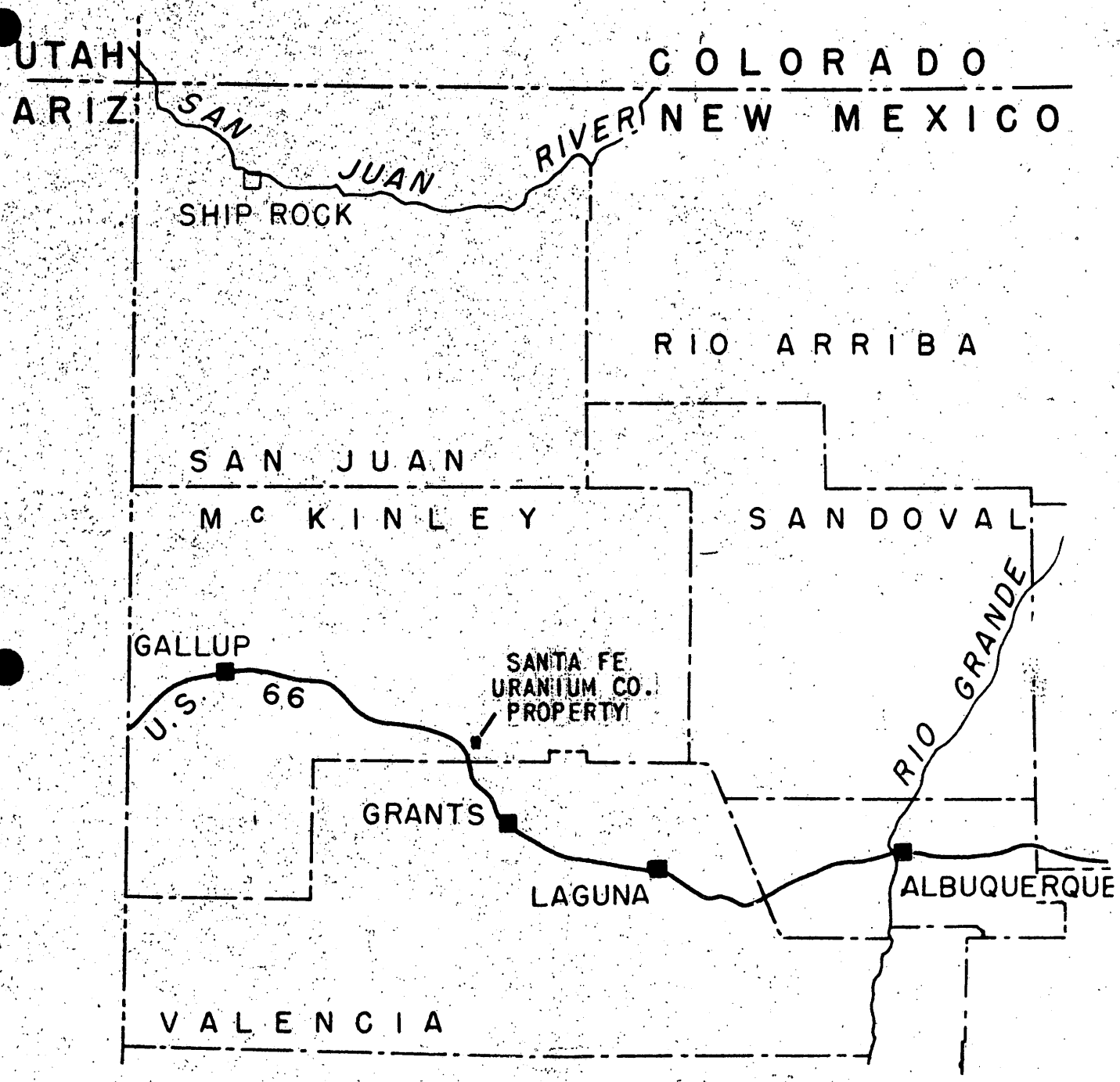

Figure 1. INDEX MAP OF NORTHWESTERN NEW MEXICO SHOWING LOCATION OF SANTA FE URANIUM CO. PROPERTY MCKINLEY COUNTY, NEW MEXICO

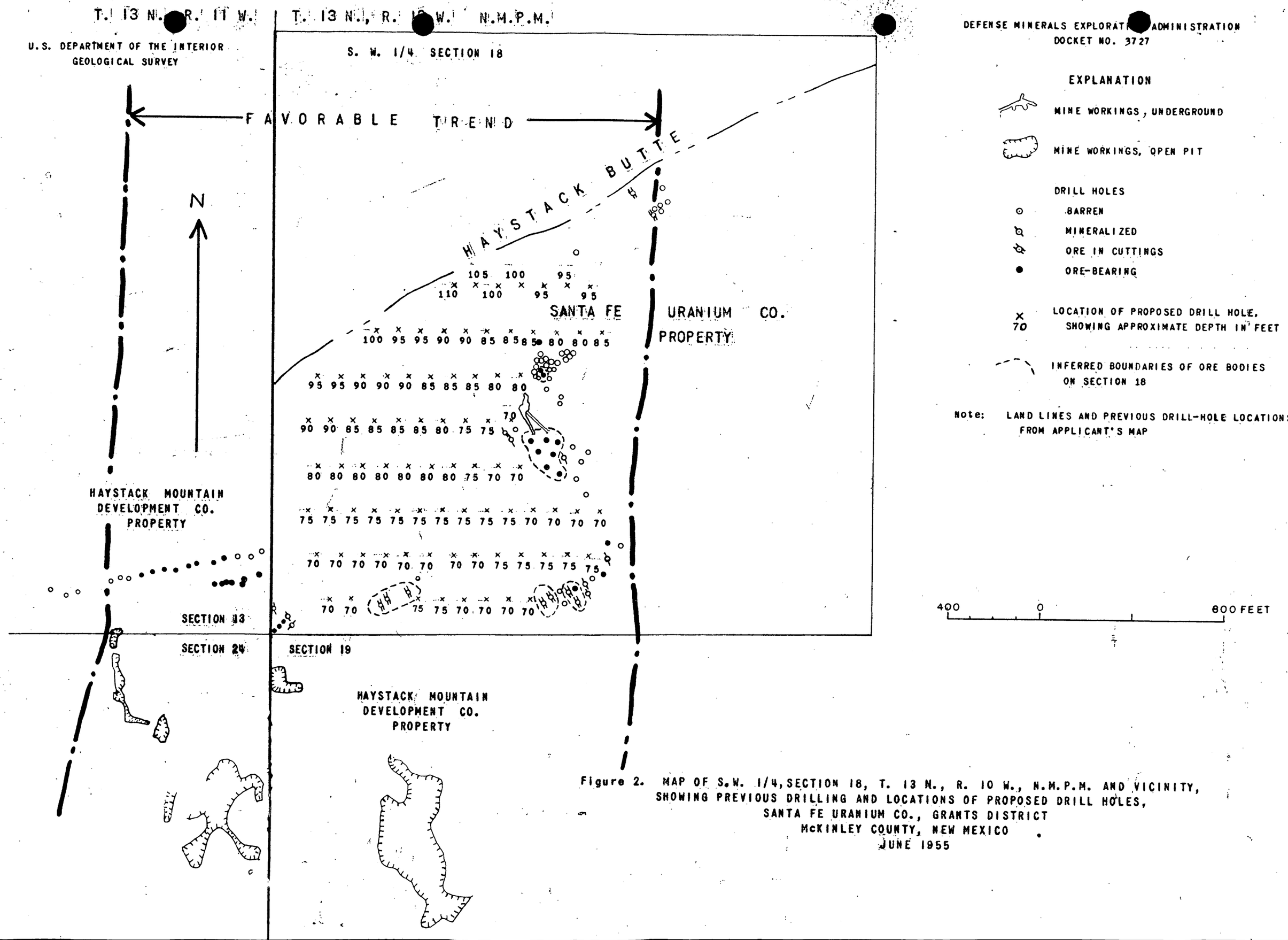

Figure 2. MAP OF S.W. 1/4, SECTION 18, T. 13 N., R. 10 W., N.M.P.M. AND VICINITY, SHOWING PREVIOUS DRILLING AND LOCATIONS OF PROPOSED DRILL HOLES, SANTA FE URANIUM CO., GRANTS DISTRICT McKINLEY COUNTY, NEW MEXICO JUNE 1955

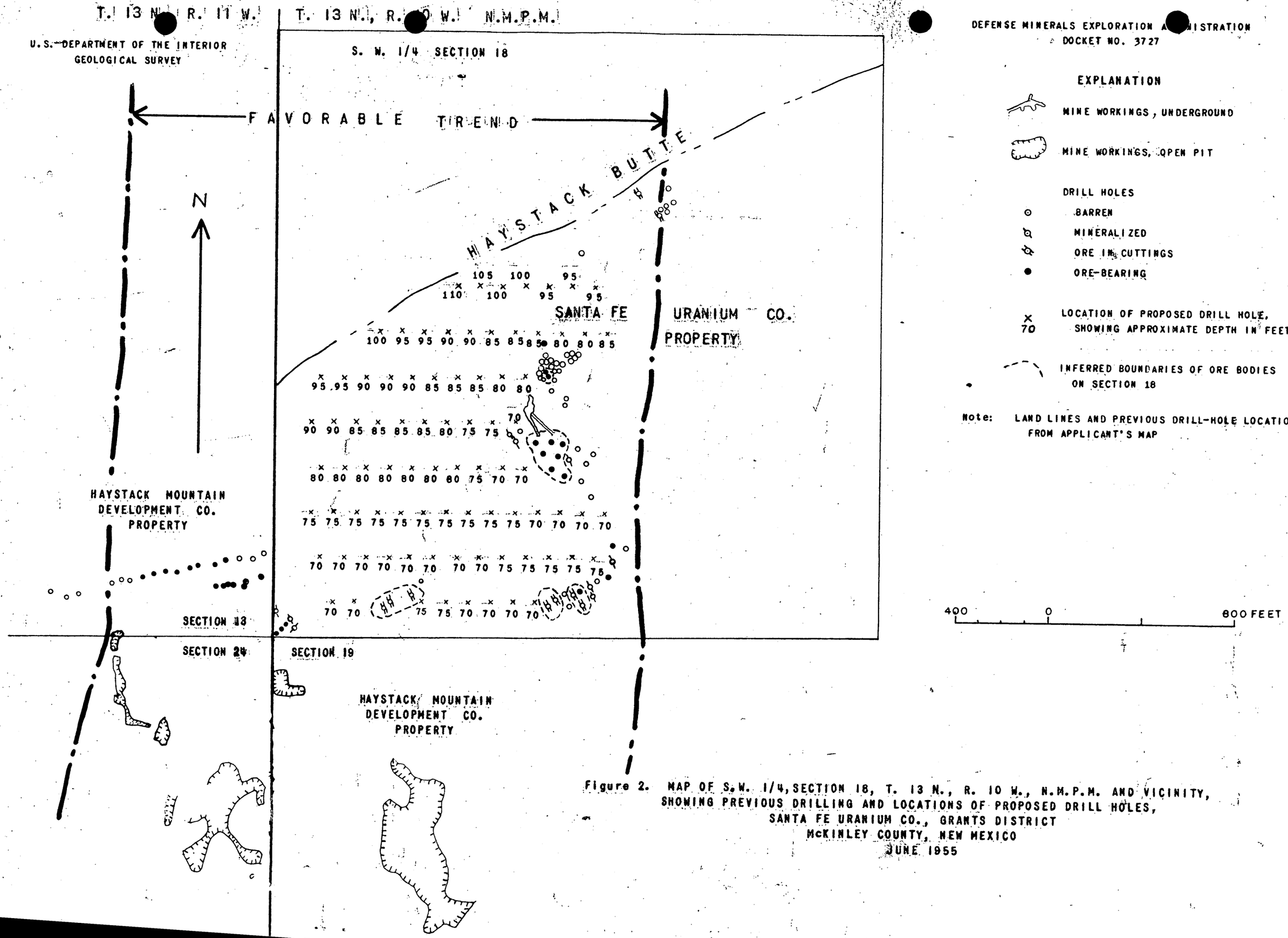

Figure 2. MAP OF S.W. 1/4, SECTION 18, T. 13 N., R. 10 W., N.M.P.M. AND VICINITY, SHOWING PREVIOUS DRILLING AND LOCATIONS OF PROPOSED DRILL HOLES, SANTA FE URANIUM CO., GRANTS DISTRICT McKINLEY COUNTY, NEW MEXICO JUNE 1955

RECEIVED
SEP - 2 1955

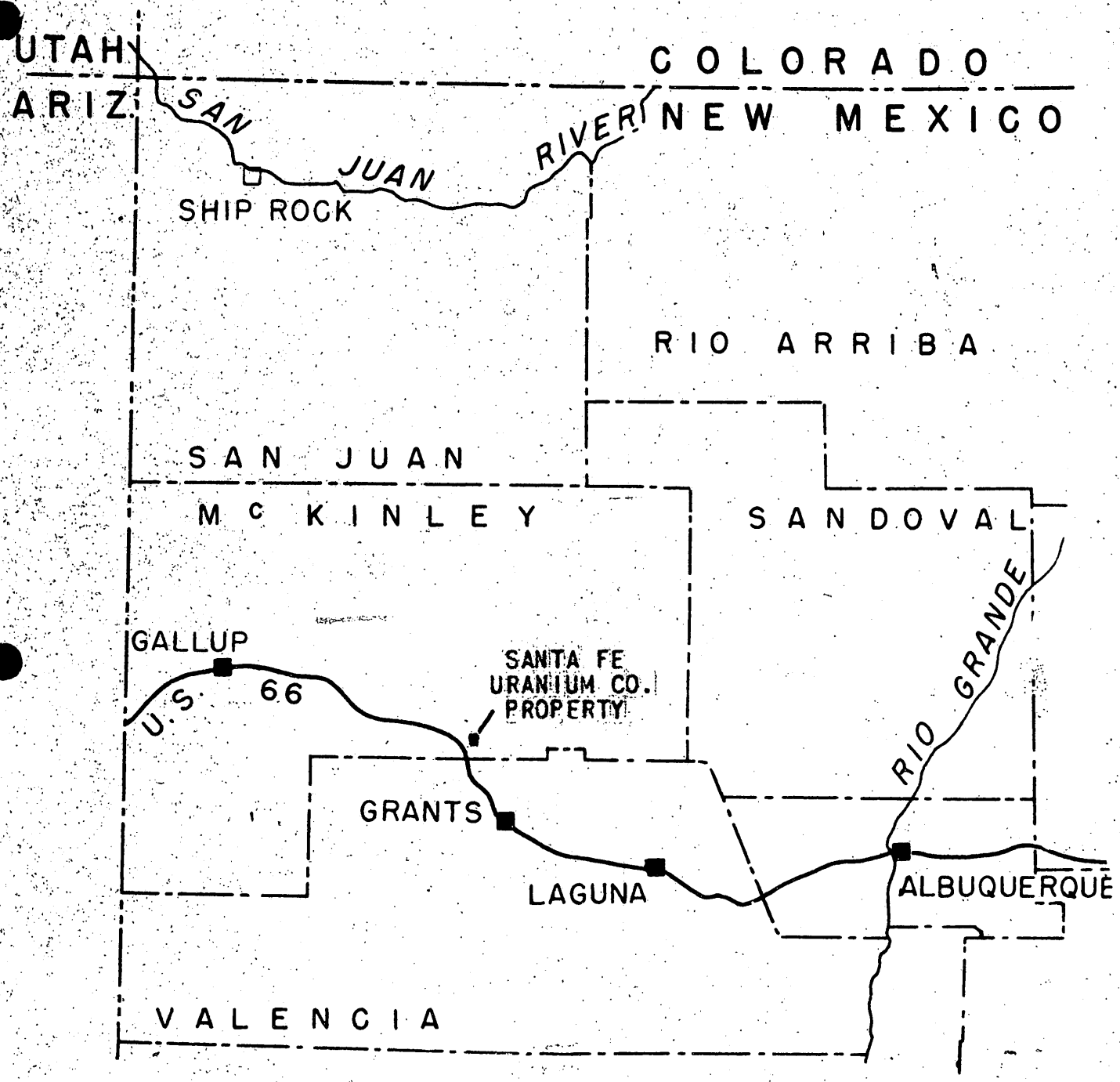

Figure 1. INDEX MAP OF NORTHWESTERN NEW MEXICO SHOWING LOCATION OF SANTA FE URANIUM CO. PROPERTY MCKINLEY COUNTY, NEW MEXICO

IN REPLY REFER TO:
Date Rec'd.

MAY 3 1955

BUREAU OF MINES
Denver, Colorado

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

RECEIVED
SEP - 2 1955

Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

May 3, 1955

TRANSMITTED
AUG 29 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3727, Santa Fe Uranium Company, McKinley County, New Mexico

Enclosed are 10 copies of a preliminary memorandum by T. E. Mullens, U. S. Geological Survey, covering his examination of the property.

It appears that considerable work has been done since submission of the application and that data on this work are needed before final action can be taken on the application for exploration assistance.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (10)

ENHarshman:arh

RECEIVED
SEP - 1955

Colorado Plateau District
P. O. Box 360
Grand Junction, Colorado

April 28, 1955

TRANSMITTED
AUG 29 1956

Memorandum

To: E. N. Harshman

From: W. P. Williams

Subject: DMEA 3727, Santa Fe Uranium Company

Transmitted herewith are 11 copies of a preliminary report on the subject application by T. E. Mullens.

The examining team discovered that Santa Fe Uranium, previous owners, and the AEC have done considerable work on the property where Santa Fe Uranium plans to explore with DMEA assistance. No mention of this work was made in the brochure.

Mullens believes that this work should be evaluated before he could recommend an exploration program. He, therefore, recommends that DMEA write to the applicant company and request the necessary information. The pertinent facts to be requested by DMEA are included in the preliminary report. I concur with the recommendation that DMEA request more information from the applicant company.

WPW

W. P. Williams
Geologist

Colorado Plateau District
P. O. Box 360
Grand Junction, Colorado

April 28, 1955

TRANSMITTED

A3529 1955

Memorandum

To: E. N. Harshman

From: T. E. Mullens

Subject: Preliminary report on DMEA 3727, Santa Fe Uranium Company, SW1/4 sec. 18, T. 13 N., R. 10 W., and N1/2 N1/2 sec. 13, T. 13 N., R. 11 W., McKinley County, New Mexico

The subject property was examined by a Region III examining team on April 26, 1955. The team consisted of Glen Walker, U. S. Bureau of Mines, and B. D. Haynes and T. E. Mullens, U. S. Geological Survey. The team was accompanied by Thomas Fife, Santa Fe Uranium Company engineer.

Briefly, the examining team will recommend some DMEA assistance to explore the SW1/4 sec. 18, but will not recommend DMEA assistance at this time to explore the N1/2 N1/2 sec. 13.

Santa Fe Uranium and the previous owners have done considerable work near some ore bodies in the central part of SW1/4 sec. 18. This work consists of a number of drill holes and an incline; however, none of the work was shown on the maps in the brochure with the exception of a "drill holes" notation. Without the location of the holes drilled and the incline, the examining team cannot plan an exploration program which would take advantage of previous work.

Mr. Fife told us that he had surveyed all holes on the property, but he has no map as he has not worked up his notes. Mr. Fife offered to send the Survey and the Bureau of Mines a copy of the map when he completes it. Then the examining team in connection with the company engineer could design a drilling program for the property.

As a matter of policy, I believe the map showing drill holes and incline should be included in the brochure. Thus, I recommend that DMEA write the applicant company and request 4 copies to go in the brochures. The maps should show the incline and drill holes. The drill holes should be divided into two classes: 1) drill holes which have been sampled and probed, and 2) drill holes which were not sampled or probed. The two classes are necessary as all records on some drill holes are lost and Santa Fe Uranium does not know what the holes penetrated. The map should also show the depth of the drill holes.

DMEA should also request that the company submit a drill hole map of the N1/2 N1/2 sec. 13. Nineteen AEC drill holes and several private drill holes have been drilled in this part of the section, and a map of these holes would complete the record. However, the examining team will not recommend any DMEA assistance for section 13 at this time.

T. E. Mullens
T. E. Mullens
Geologist

DRAFT
9/13/55
FMMurphy/gla

Division

MF-200
(Revised June 1954)

Docket No. DMEA 3727

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] Santa Fe Uranium Company, Inc. c/o Nathan Wecheler, whose mailing address is 1010 Vermont Avenue, N. W. Washington, D. C., 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 3.
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 New Mexico, County of McKinley, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] Lessee of [5] 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] see Annex I, [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: See Annex I

(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: Performance Bond for $10,272.00

(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 April 15, 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 $ 13,696.00. The Government shall contribute 75 percent of the allowable costs as they are incurred in a total sum not in excess of $ 10,272.00: *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.

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.*—

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By .....

.....
(Operator)

By .....

.....

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

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9/13/55

EXPLORATION PROJECT CONTRACT
SANTA FE URANIUM COMPANY, INC.
DOCKET NO. DMEA-3727

ANNEX I

The land referred to in Article 2 of the contract form comprises the S.W. ¼ of Sec. 18, T. 13 N., R. 10 W., N.M.P.M., McKinley County, New Mexico.

The property, consisting of 163.38 acres, is Navajo Indian allotted land leased to Brown Vandever, Allottee 077031, who assigned the lease to Glenn D. Williams and J. T. Hutton, on June 7, 1951. J. T. Hutton and wife assigned their interest to Glenn Williams, January 26, 1953. Glenn Williams assigned lease to Santa Fe Uranium Company on June 23, 1954.

EXPLORATION PROJECT CONTRACT
SANTA FE URANIUM COMPANY, INC.
DOCKET NO. DMEA-3727

EXHIBIT "A"

Description of the Work

The object of this project is to explore the Jurassic Todilto limestone, underlying the subject property, by means of rotary drilling. It is estimated that drill holes averaging 85 feet in depth will be required to penetrate this ore-bearing limestone, which ranges from 10 to 35 feet in thickness.

The work shall be divided into two stages. The operator shall complete all the work in Stage I and so much of Stage II as is approved in advance in writing by the Government.

STAGE I

Stage I shall consist of drilling not in excess of 83 holes totaling approximately 7,055 feet. The approximate locations of the drill holes are shown on attached map entitled "Figure 3 - Map Showing Mine Workings, Old Holes, And Proposed Holes of Santa Fe Uranium Co., - - - - -." The holes shall be drilled along 8 east-west trending lines spaced about 200 feet apart. The interval between holes on their respective lines shall be 100 feet. The holes along successive lines shall be staggered. The southernmost line shall be about 150 feet north of the southern boundary of Sec. 18. The end holes in alternating lines shall be about 150 feet and 200 feet east of the western boundary of Sec. 18.

If the drill footage estimated for Stage I drilling is not sufficient to complete the 83 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.

Not in excess of 50 samples shall be chemically analyzed for their U_3O_8 content under this Stage I of the contract.

STAGE II

Stage II shall consist of drilling not in excess of 52 offset holes, aggregating not in excess of 4,420 feet of rotary drilling. The offset holes shall be drilled not closer than 50 feet N. 45° W., N. 45° E., S. 45° W., and S. 45° E. from any mineralized hole discovered in Stage I drilling.

No hole drilled under Stage II shall be closer than 50 feet to any previously drilled hole.

Not in excess of 40 samples shall be chemically analyzed for their U_3O_8 content under this Stage I of the contract.

General Provisions

A geologist-mining engineer and one helper shall be employed full time under this contract.

All holes shall be cased or drilled wet, using drilling mud (Aguagel, Silvacel, or any other type of sealing additive) through the overburden and unconsolidated rocks. From about 20 feet above the estimated top of the Todilto limestone, the hole will be drilled dry until it penetrates at least 5 feet into the underlying Entrada sandstone. However, if cuttings from the hole, at this depth, register

0.02 percent eU_3O_8 or more on a Geiger instrument used to check the return air stream, then the hole shall be continued until the instrument registers less than 0.02 percent eU_3O_8.

Starting from a point in the drill hole not lower than 10 feet above the estimated top of the Todilto, all cuttings will be tested by placing a Geiger tube in the return air stream at the mouth of the drill hole.

When the Geiger instrument registers 0.02 percent eU_3O_8 or more, samples shall be collected at each 1-foot interval. All samples collected shall be checked radiometrically in the field. Every tenth sample registering in excess of 0.02 percent eU_3O_8 shall be chemically analyzed to verify the results of the radiometric analysis.

One-half of all samples that are assayed, radiometrically or chemically, shall be properly identified as to hole number and depth represented, and then stored for Government use.

All drill holes shall be logged radiometrically as soon as completed.

The Operator, together with his monthly report, shall submit a map of the property showing the location of all holes drilled with their collar elevations and depths indicated; also, copies of the driller's logs and results of sample analyses.

The Government will not contribute to the cost of any hole which does not penetrate the Todilto limestone or to any hole which cannot be probed with radiometric logging equipment.

The supervision, the extent and method of sampling, the location of drill holes, and the drilling method used are all subject to Government approval.

	Costs	
Independent Contracts, 1/ Category (1)		
11,475 feet of rotary drilling @ $0.80/ft. (includes casing or use of drilling mud)	$9,180.00	
Fixed Unit Costs		
Incidental allowance 2/ for each foot of drilling completed, 11,475 feet @ $0.37/ft.	4,245.75	
Chemical analyses for U_3O_8,		
90 samples @ $3.00 each	270.00	
Total Estimated Cost of Project (rounded)		$13,696.00
Government Participation @ 75%		$10,272.00

1/ Categories (2) through (7) do not apply to this contract.
2/ Includes all costs whatsoever that are not included in the estimates for "Independent Contracts" and analyses of samples, and includes such items as supervision, labor, payroll taxes, materials, supplies, rental of radiometric logging equipment, etc., which would otherwise be allowable under Categories (2) through (7) of the contract form.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 16 1955

APPLICATION TO DMEA

No. 3727

SANTA FE URANIUM COMPANY

Prepared by:

WECHSLER AND COMPANY
1010 Vermont Avenue, N.W.
Washington, D. C.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 16 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. 3727
Metal or Mineral Uranium-Vanadium
Date Received 3-16-55
Estimated Cost $222,321
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: Santa Fe Uranium Company, Inc.
620 Judge Building
Salt Lake City, Utah

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

(*c*) If a corporation, add to above statement, titles, names and addresses of officers. See Report - Page 1

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

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

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract See Report - Page 2

(*b*) State any mine name by which the property is known. See Report - Page 2

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

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

(*e*) If you own the land, describe any liens or encumbrances on it See Report - Page 2

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

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. See Report - Page 3

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades See Report - Pages 3, 4 & 5

(*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 Report - Pages 3, 4 and 5

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. See Report - Page 8

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

See Report - Page 8

16—66551-1

5. *The exploration project.*—(*a*) State the mineral or minerals for which you w[illegible]o explore Uranium-Vanadium

(*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 Report - Page 8

(*c*) The work will start within 6 weeks days and be completed within 8 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See Report - Page 11

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 Report - Page 13

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

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel. See Report - Page 13

(*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 Report - Page 13

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

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project. See Report-Page 13

(*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 Report - Page 13

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

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

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)? See Report - Page 14

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

☒ Money ☐ Use of equipment owned by you ☐ Other

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated March 12, 1955

Santa Fe Uranium Company, Inc.
(Applicant)

By Gladhow Webster
Power of Attorney

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

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, That SANTA FE URANIUM COMPANY, a [illegible] corporation, does hereby make, constitute and appoint, NATHAN WECHSLER, [illegible] its true and lawful attorney, to appear for it and represent it before the United States Department of [illegible], the Minerals [illegible] Administration, in connection with [illegible] exploration project [illegible] [illegible]

[illegible] communications [illegible] regarding any matter in which the said attorney is [illegible] be addressed [illegible]

Mr. Nathan [illegible]
[illegible] Vermont Avenue, N.W.
Washington, D. C.

A [illegible] attorney [illegible] by [illegible]

IN WITNESS WHEREOF, the said SANTA FE URANIUM COMPANY, [illegible] this power of attorney in duplicate by [illegible] its President, [illegible] A. D. Mango [illegible] its Secretary, [illegible] 1955. A. D.

SANTA FE URANIUM COMPANY

By [signature]
President

[illegible]

[signature]
Secretary

STATE OF [illegible]

COUNTY OF SALT LAKE

[illegible] before me [illegible] duly sworn, did say that they are the [illegible] Secretary, respectively, of the above corporation, [illegible] executed the foregoing power of attorney, [illegible] the city and county aforesaid.

[illegible] my hand and notarial seal this [illegible]

[illegible]

[signature]
Notary Public

SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
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MAR 16 1955

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SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

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SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

REPORT ACCOMPANYING APPLICATION TO DMEA

1. NAME OF APPLICANT

(a) The applicant is the Santa Fe Uranium Company, 620 Judge Building, Salt Lake City, Utah.

(b) The Santa Fe Uranium Company is a corporation organized under the laws of the State of Utah, and authorized to do business in New Mexico.

(c) The following are the titles, names and addresses of officers:

(1) President and Director:

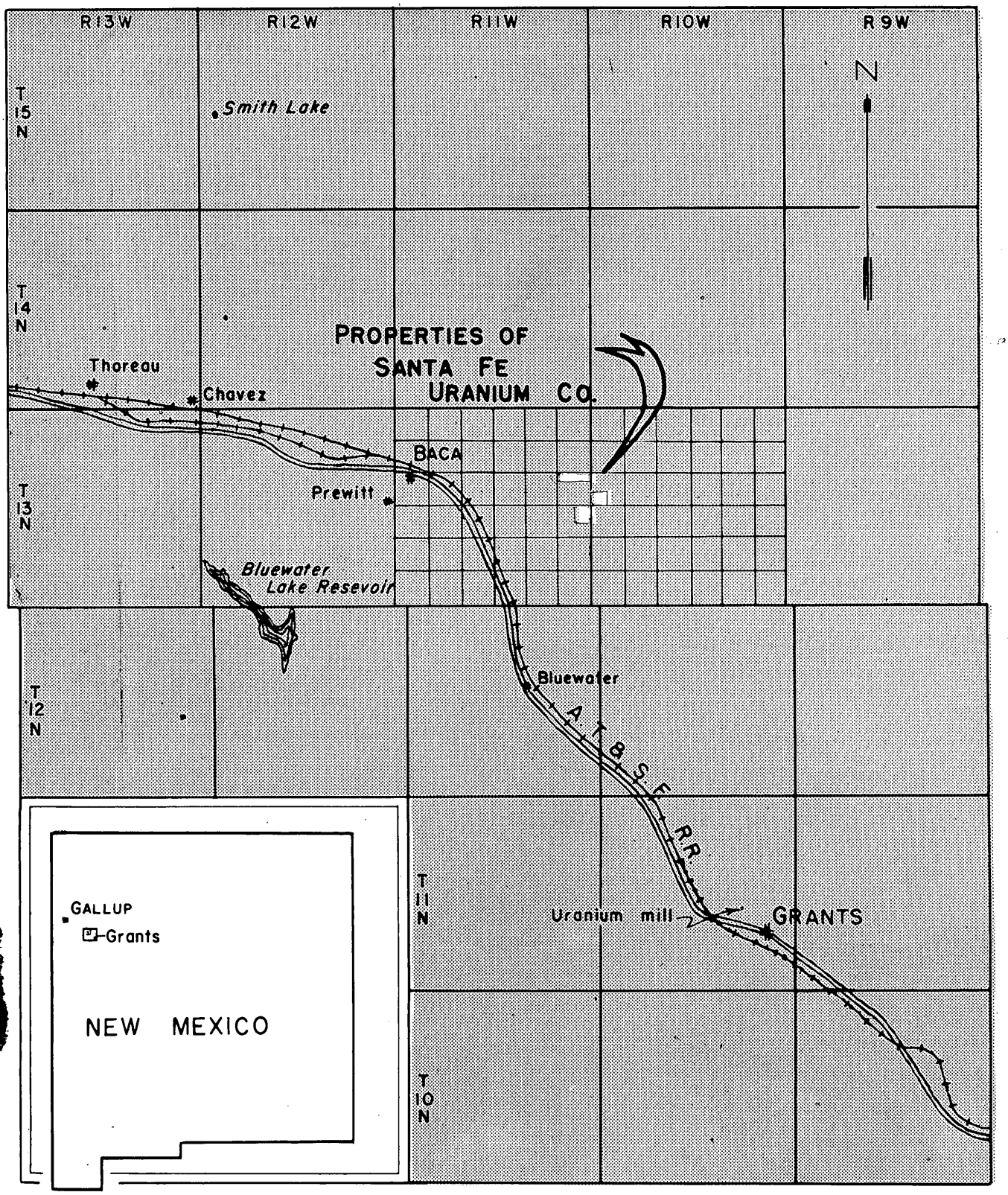
H. R. Brownson
Wenatchee, Washington

(2) Vice-President and Director:

Hyrum Schnieder
4 1 Florence Drive
Lafayette, California

(3) Secretary and Treasurer:

A. D. Morgan
579 12th Avenue
Salt Lake City, Utah



INDEX MAP SHOWING LOCATION
OF THE
SANTA FE URANIUM COMPANY NEW MEXICO

SCALE

1 3/4 1/2 1/4 0 mile

GEOPROFESSIONAL
SERVICES INC.

any way casts doubt on the possibility of ore under cover back of the present known deposits. In other words all evidence favors the interpretation that the ore bodies are probably just as numerous under cover as they are at the eroded and stripped edge of the formation where they are being mined at present. This idea is vital to an eval- of the district as a whole and in this instance partic the Santa Fe Uranium Company properties.

The area in the immediate vicinity of the Santa Fe Uranium Company properties is known as one of the largest producers of Todilto type ore in the Grants district. This is one of the most favorable factors regarding the properties. As shown by the appended map, the two southern tracts of the Santa Fe Uranium Company property directly adjoin and partially surround the very large and productive mines of the Santa Fe Railroad Company. While some of the ground within Sec. 24 lies below the Todilto formation and has little value, some of it covers exposed Todilto and also thinly covered favorable ground. In fact this area has, as of April 30, 1954, already produced ore having a value of $301,-932.81 and has not been fully explored. The tract in Sec. 18 covers a small amount of actual outcrop of Todilto, but about half of the area appears to have cover which can be economically removed if ore is being followed or has been located by drilling. The northern tract, in Sec. 13 has deeper cover but the productive formation is still within the range of economic development.

PRODUCTION DATA
(To May 1, 1954)

SW¼, Sec. 18, T. 13 N., R. 10 W.–Approx. 1600 tons. Average U3O8 content /0.23–value $45,-813.18.

NE¼, Sec. 24, T. 13 N., R. 11 W.–Approx. 12,000 tons. Average U3O8 content /0.23–value $301,-932.81.

The foregoing includes bonuses and haulage allowances.

ORE RESERVES

On April 30, stripping operations had exposed a bend of Todilto limestone. Since that date the chief activity has consisted of drilling to determine the trend of known ore bodies and to establish new reserves. On July 1, 1954, 80 drill holes had been completed and these were examined and tested with the Geiger probe to determine the tenure and tonnage of newly found ore. The said drill holes are spaced from 15 to 23 feet apart and have tested an area comprising 65,450 square feet. Of the said 80 drill holes, 8 had collapsed and no data were obtainable. The remaining holes were all in mineralized formation. Thickness of the ore bearing bed ranges from 10 to 20 inches.

On the basis of our inspection of the property and from the prior operations thereon and the aforesaid drilling data, we believe that the potential reserves of marketable ore are large.

It should be noted that said Geiger counter readings and estimates may or may not be accurate. They do not constitute the most accurate method of determining ore reserves.

SUMMARY

The Santa Fe Uranium Company properties are considered favorable for the production of uranium ore on a profitable basis for the following reasons:

1. They are located on the productive Todilto limestone and cover structures (folds) and types of rock that are favorable to ore formations by all known criteria.

2. They are in geographically favorable territory. The SW¼, Sec. 18 and NW¼, Sec. 24 are immediately adjacent to the large and highly productive tracts owned by the Santa Fe Railroad Company. Production from these adjacent tracts has averaged over 200 tons of ore per day for more than one year.

3. To date, mining has been from easily discov ed surface exposures and has chiefly followed the o Much untested ground remains to be explored.

4. Drill holes have encountered ore in the SW SW¼, Sec. 18.

5. The uniform tenure of the ore, demonstrat ore reserves, close proximity to milling facilities, a ease of mining are features which contribute to the eco omic attractiveness of the Santa Fe Uranium Company properties.

Submitted by,
GEOPROFESSIONAL SERVICES, INC.

/s/ A. J. Eardley
A. J. Eardley

/s/ F. W. C. by N. C. W. A.J.E.
F. W. Christiansen

/s/ Norman C. Williams
Norman C. Williams

SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

3. PROPERTY RIGHTS

The company holds mineral leases on the following described properties located in McKinley County, East Navajo, New Mexico, the same being allotted Indian Lands on which the DMEA loan application is being applied for.

8-30-55 Note: Dis regard this "line-out." It is correct as stated, per Nathan Wechsler the above date. RWS.

(1) ~~Lots 3 and 4 and the E 1/2 of~~ SW 1/4 of Section 18, Township 13 North, Range 10 West, N.M.P.M.

(2) The N 1/2 N 1/2 of Section 13, Township 13 North, Range 11 West, N.M.P.M.

The said leases are subject to overriding royalties of 3% in favor of J.T. Hutton and Parallee Hutton, Farmington, New Mexico, and a sliding royalty of 10% to 20% depending upon grade of ore in favor of the Indian lessors, as follows:

Mine Value per Dry Ton	Royalty Percentage
$ .01 to $ 10.00 inclusive	10%
10.01 to 20.00 "	11%
20.01 to 30.00 "	12%
30.01 to 40.00 "	13%
40.01 to 50.00 "	14%
50.01 to 60.00 "	15%
60.01 to 70.00 "	16%
70.01 to 80.00 "	17%
80.01 to 90.00 "	18%
90.01 to 100.00 "	19%
100.01 to more	20%

The location of the said properties are more fully set forth in the geological report and accompanying maps included in this report. Matters of title are also set forth herein. The foregoing constitute all of the properties presently held by the company except the NE 1/4 of Section 24, Township 13, North, Range 11 West, upon which no loan application is being made and upon which there is current production.

SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

4. PHYSICAL DESCRIPTION

(a) History

The Santa Fe Uranium Company uranium properties comprise three tracts of 160 acres each. The properties are centrally located in the Grants uranium district which extends for approximately 65 miles along the southern flank of the San Juan basin between Thoreau and Correo, New Mexico. Uranium was discovered in the Grants area in 1950, in the NE 1/4, Sec. 19, T. 13 N., R. 10W., adjacent to two of the Santa Fe Uranium Company quarter-sections. Compared to other uranium districts of the Colorado Plateau, the Grants district is of relatively recent discovery and is in an early stage of development. The Grants district has not yet entered the stage of feverish land play which exists, for example, in southeastern Utah. Nevertheless, the district is well established and portends to become of major importance. Numerous new mines are being developed and the Anaconda Copper Mining Company is expanding mill facilities at Grants, New Mexico, to accommodate the increase of production of ore.

The area in the immediate vicinity of the Santa Fe Uranium Company properties is known as one of the largest producers of Todilto type ore in the Grants distric t. This is one of the most favorable factors regarding the properties. As shown by the appended map, the two southern tracts of the Santa Fe Uranium Company property directly adjoin and partially surround the very large and productive mines of the Santa Fe Railroad Company. While some of the ground within Sec. 24 lies below the Todilto formation and has little value, some of it covers exposed Todilto and also thinly covered favorable ground. In fact this area has, as of April 30, 1954, already produced ore having a value of

$301,932.81 and has not been fully explored. The tract in Sec. 18 of the area appears to have cover which can be economically removed if ore is being followed or has been located by drilling. The northern tract, in Sec. 13 has deeper cover but the productive formation is still within the range of economic development.

(b) Past Production (to May 1, 1954)

SW¼, Sec. 18, T. 13 N., R. 10W - Average U308 content +0.23 -- Value $45,813.18

NE¼, Sec. 24, T. 13 N., R. 11 W. - Average U308 content +0.23 -- Value $301,932.81

Ore Reserves:

On April 30, stripping operations had exposed a bench of ore-grade Todilto limestone which was measured and calculated to contain 17,000 to 20,000 tons of ore. Since this date, the chief activity has consisted of drilling to determine the trends of known ore bodies and to establish new reserves. On June 5, 1954, 45 drill holes had been completed and these were examined and tested with the Geiger probe to determine the tenure and tonnage of newly found ore. The 45 drill holes are spaced from 15 to 23 feet apart and have tested an area comprising 36,800 square feet. Of the 45 drill holes, 8 had collapsed and no data were obtainable. The remaining 37 holes were all in mineralized formation and indicated ore ranging from .20% U308 to 1.80% U308. Thickness of the ore bearing bed ranges from 10 to 20 inches. The 36,800 square foot areas averages 1 foot of .40% U308 ore which reduced to an optimum grade of .21% U308 would permit of approximately a two foot mineable zone containing about 6,500 tons. This 6,500 tons represents a reserve of mineable ore which is in addition to the 17,000

to 20,000 tons of exposed ore.

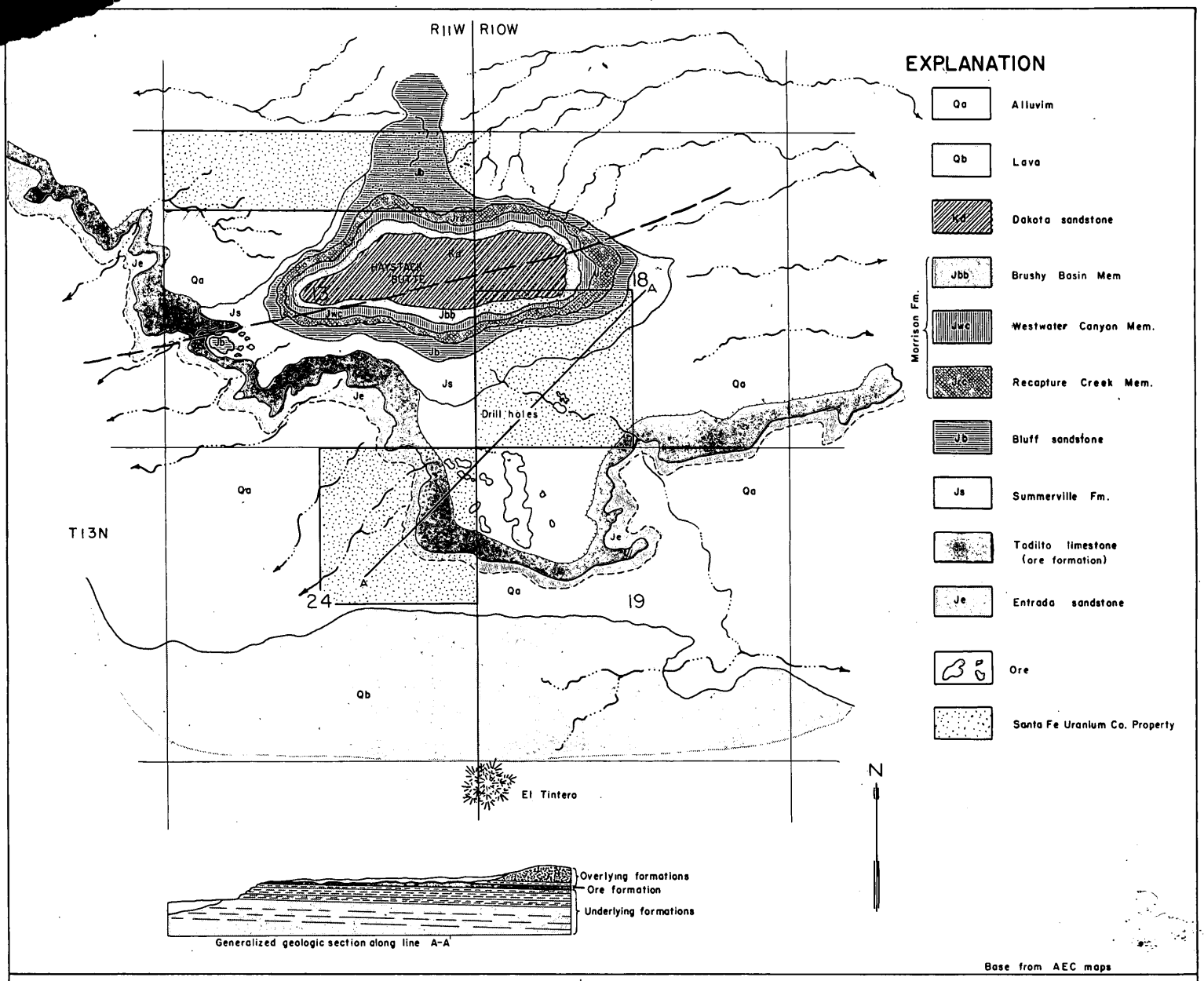
To date, the ore on the Santa Fe Uranium Company properties and on large adjacent ore bodies has demonstrated a remarkably uniform grade. The average U308 content ranges from 0.20 to 0.26. Higher and lower content is present, but for overall economy, the operators seek to maintain an average shipping grade of 0.21 to 0.24% U308.

(c) Geologic Setting

Rocks exposed in the Grants Uranium District include Triassic, Jurassic and Cretaceous formations which are mainly of continental origin. Ore has been found in the Todilto limestone, the Morrison and Dakota sandstone. Production from each of these formations has been significant and promises to increase.

The district lies mainly on the northeast flank of the Zuni uplift and the beds dip gently northward into the San Juan Basin. The hard and soft formations outcrop as cliffs and slopes, the harder beds, including the Todilto limestone, forming wide dip slopes. The Todilto outcrops are near the valley level and transportation and road building to the chief ore deposits have been relatively easy.

The ore consists of a variety of minerals but the outstanding characteristic is the high content of limestone that must be mined and treated to extract the uranium. This type of ore is much different from the sandstone type lone mined from the Morrison formation. The new Anaconda mill which is designed specifically for limestone ores will greatly stimulate mining.



GEOLOGIC MAP of SANTA FE URANIUM CO. AND ADJOING PROPERTIES, N.M.

SCALE 1000 0 1/4 1/2 3/4 1 mile

GEOPROFESSIONAL SERVICES INC.
1311 WALKER BANK BUILDING, SALT LAKE CITY, 1, UTAH

REPORT ON THE SANTA FE URANIUM COMPANY P
GRANTS, NEW MEXICO

INTRODUCTION

The Santa Fe Uranium Company uranium properties comprise three tracts of 160 acres each. The properties are centrally located in the Grants uranium district which extends for approximately 65 miles along the southern flank of the San Juan basin between Thoreau and Correo, New Mexico. Specifically, the properties are the SW¼, Sec. 18, T. 13 N., R. 10 W.; NW¼, Sec. 24, T. 13 N., R. 11 W.; N½, N½, Sec. 13, T. 13 N., R. 11 W.

Uranium was discovered in the Grants area in 1950, in the NE¼, Sec. 19, T. 13 N., R. 10 W., adjacent to two of the Santa Fe Uranium Company quarter-sections. Compared to other uranium districts of the Colorado Plateau, the Grants district is of relatively recent discovery and is in an early stage of development. The Grants district has not yet entered the stage of feverish land play which exists, for example, in southeastern Utah. Nevertheless, the district is well established and portends to become of major importance. Numerous new mines are being developed and the Anaconda Copper Mining Company is expanding mill facilities at Grants, New Mexico, to accommodate the increase of production of ore.

General Geology

Rocks exposed in the Grants uranium district include Triassic, Jurassic and Cretaceous formations which are mainly of continental origin. Ore has been found in the Todilto limestone, the Morrison and Dakota sandstone. Production from each of these formations has been significant and promises to increase.

The district lies mainly on the northeast flank of the Zuni uplift and the beds dip gently northward into the San Juan Basin. The hard and soft formations outcrop as cliffs and slopes, the harder beds, including the Todilto limestone, forming wide dip slopes. The Todilto outcrops are near the valley level and transportation and road building to the chief ore deposits have been relatively easy.

The ore consists of a variety of minerals but the outstanding characteristic is the high content of limestone that must be mined and treated to extract the uranium. This type of ore is much different from the sandstone type long mined from the Morrison formation. The new Anaconda mill which is designed specifically for limestone ores will greatly stimulate mining.

Relation of Uranium to the Todilto Limestone

The Todilto formation consists of shale, limestone and gypsum and is thought to have been deposited in a shallow arm of the sea. Uranium is known only in the limestone beds which were apparently laid down in an intermediate position between the shore where shale was deposited and the deeper central part of the basin where gypsum was formed. The limestone occurs in thin beds and is seldom over 15 feet in thickness. In many places the formation exhibits numerous small-scale folds or crenulations and is also cut by fractures and joints. Much study has been made of possible effects of the folding and jointing on the formation of ore. Ore does seem to be localized chiefly in the folds but relatively few of the folds are mineralized. Mapping of one of the chief mineralized areas showed that five out of seven ore bodies are localized on primary folds despite the fact that these folds occupy less than 10 percent of the linear extent of the rim. No universally accepted ideas have been advanced which explain the time of origin of the ore and not much progress has been made on guides which will predict the presence of ore bodies hidden from view. In a few instances analysis of vegetation rooted in ore has helped in outlining mineralized ground but the use of the method is limited. Drilling remains the best method for proving ore and calculating reserves and so far drilling has been relatively easy since the overburden is shallow and easily penetrated.

Analysis of the Santa Fe Uranium Company Property

Four questions must be answered as fully as possible in deciding on the value and potential of any property being considered for purchase or lease: (1) Is it in a favorable formation? (2) Is it in a mineralized district, area or "trend"? (3) Does it cover ground that can be mined under present economic demands for uranium? (4) What is the previous production record and does this indicate the properties are exhausted of ore? As proved by long experience the best indications as to what may be expected on undeveloped property is what can be seen on adjacent developed ground. The grade and type of ore of any deposit may be like the deposits found nearby although there is no positive assurance that this will be the case.

The properties are located in the Todilto formation of Jurassic age which is rated in the top four uranium producing formations in the Colorado Plateau. Uranium mineralization occurs along the outcrop of the Todilto which extends approximately 65 miles from Thoreau to near Correo, along the Santa Fe Railway. Literally scores of ore bodies have been found by surface prospecting and also by drilling and geobotanical methods. The Santa Fe Uranium Company properties include and lie adjacent to some of the better known deposits. Although many theories have been put forth to explain the localization of the ore no one theory has gained much support. The details of the various ideas need not be given here except to point out that no evidence exists which ..

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620 Judge Building
Salt Lake City, Utah

DEPARTMENT OF THE INTERIOR
Bureau of Mines Minerals Administration
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The properties are located in the Todilto formation of Jurassic age which is rated in the top four uranium producing formations in the Colorado Plateau. Uranium mineralization occurs along the outcrop of the Todilto which extends approximately 65 miles from Thoreau to near Correo, along the Santa Fe Railway. Literally scores of ore bodies have been found by surface prospecting and also by drilling and geobotanical methods. The Santa Fe Uranium Company properties include and lie adjacent to some of the better known deposits. Although many theories have been put forth to explain the localization of the ore no one theory has gained much support. The details of the various ideas need not be given here except to point out that no evidence exists which in any way casts doubt on the possibility of ore under cover back of the present known deposits. In other words all evidence favors the interpretation that the ore bodies are probably just as numerous under cover as they are at the eroded and stripped edge of the formation where they are being mined at present.

This idea is vital to an evaluation of the district as a whole and in this instance particularly to the Santa Fe Uranium Company properties.

(d) Accessibility

The properties are located in the Grants uranium district, between Thoreau and Correo, New Mexico.

(d) Availability of Manpower, Materials, Supplies and Equipment:

Manpower, materials, supplies, equipment, etc., are available from Gallup, New Mexico, Grants, New Mexico and Albuquerque, New Mexico.

5. THE EXPLORATION PROJECT

(a) Objective

The sole objective of the exploration program is the discovery of uranium-vanadium ore.

(b) Proposed Work

The program of proposed work submitted for your consideration and examination is, at best, only tentative, since it is fully realized that at this stage neither the full scope of the project, if approved, nor the direction it will take, can be determied with any certainty. With these limitations in mind, it is possible to formulate a general plan of exploration which may serve as a basis for later discussions between the corporation and the DMEA.

So far as may be anticipated at this time, the exploratory work may be divided conveniently into three stages; the work in each new stage dependent upon the results obtained in the stage just completed. No rigid rules can be laid down, as any program to be successful must be reasonably flexible to permit alterations in plans as new data become available.

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620 Judge Building
Salt Lake City, Utah

It is obvious that the major costs for any program in the area will be represented by the cost of drilling. The amount of drilling required to thoroughly prospect the ground will be the basic factor governing the length of the project, and this factor, in turn, will largely control the overall costs. It is important, therefore, that some tentative drilling footages and depths should be determined in order that a basis may be established for submitting this application to your agency.

Phase 1 - Reference is made to Plate 1 (following Page 10) which will show the approximate number of holes, spaced on 1,000 foot center, which could be drilled within acreage available for exploration. It will be noted that the Santa Fe Company's claim group has been divided into three separate phases. Holes drilled on this coordinate spacing would be for the primary purpose of obtaining a better understanding of the sub-surface geologic conditions, especially those related to thicknesses, characteristics and mineralization of the formation. Data obtained in this Phase 1 drilling will help to establish within close limits the depths where coring of the formation should be commenced in subsequent holes.

The number of holes and the drilling footages for the area (Plate 1) may be estimated as follows:

Phase 1:	21 Holes	425 feet Average Depth	8925 Total Footage

It may be noted that the coordinate lines of the grid have been oriented in such a way as to be normal to what is considered the mineralized zone trend.

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SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

It may be noted that the coordinate lines of the grid have been oriented in such a way as to be normal to what is considered the mineralized zone trend.

Although the exact thickness of the Todilto is not known, it has been estimated for calculation purposes that 420 feet of coring will be necessary to penetrate this unit. This figure may possibly be reduced after several holes have been drilled and the mineralized zone definitely established.

Using this average for Phase 1, it is estimated that the 21 holes will require about 420 feet of coring and about 8505 feet of plugging with rotary bits.

It is suggested that core diameters should not be less than BX in size. The diameter of the hole from the surface to the top of the cored section will depend upon the equipment employed by the drilling contractor.

It is proposed to carry out standard radio-metric drill-hole logging during this and subsequent phases of the work.

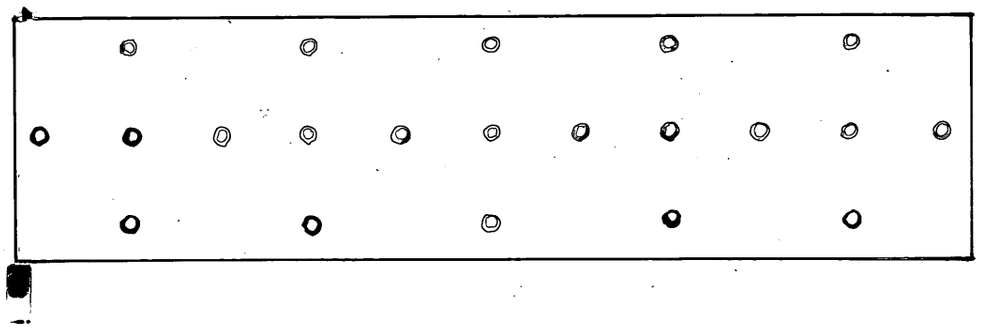
Phase 2 - The overlay on Plate 1 (following Page 10 indicated the approximate number of holes required to explore the property on a 500-foot spacing.

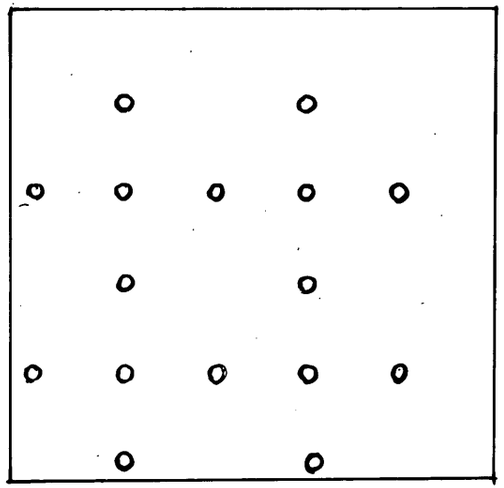
Assuming for estimation purposes that such a program were carried out the footage and holes to be drilled may be calculated as follows:

37 Holes	465 Feet Average Depth	17205 Total Footage

It must be noted that the average depth of the holes varies somewhat in Phases 1 and 2 because of the varying number of holes in area 1 and 2 as indicated on Plate 1.

On the basis of 20 feet of coring per hole, the total cored footage would amount to 740 feet, leaving a balance of 16465 feet of plug-hole drilling.





Overlay No 1

Showing Phase 2
Drill holes on 500' Centers

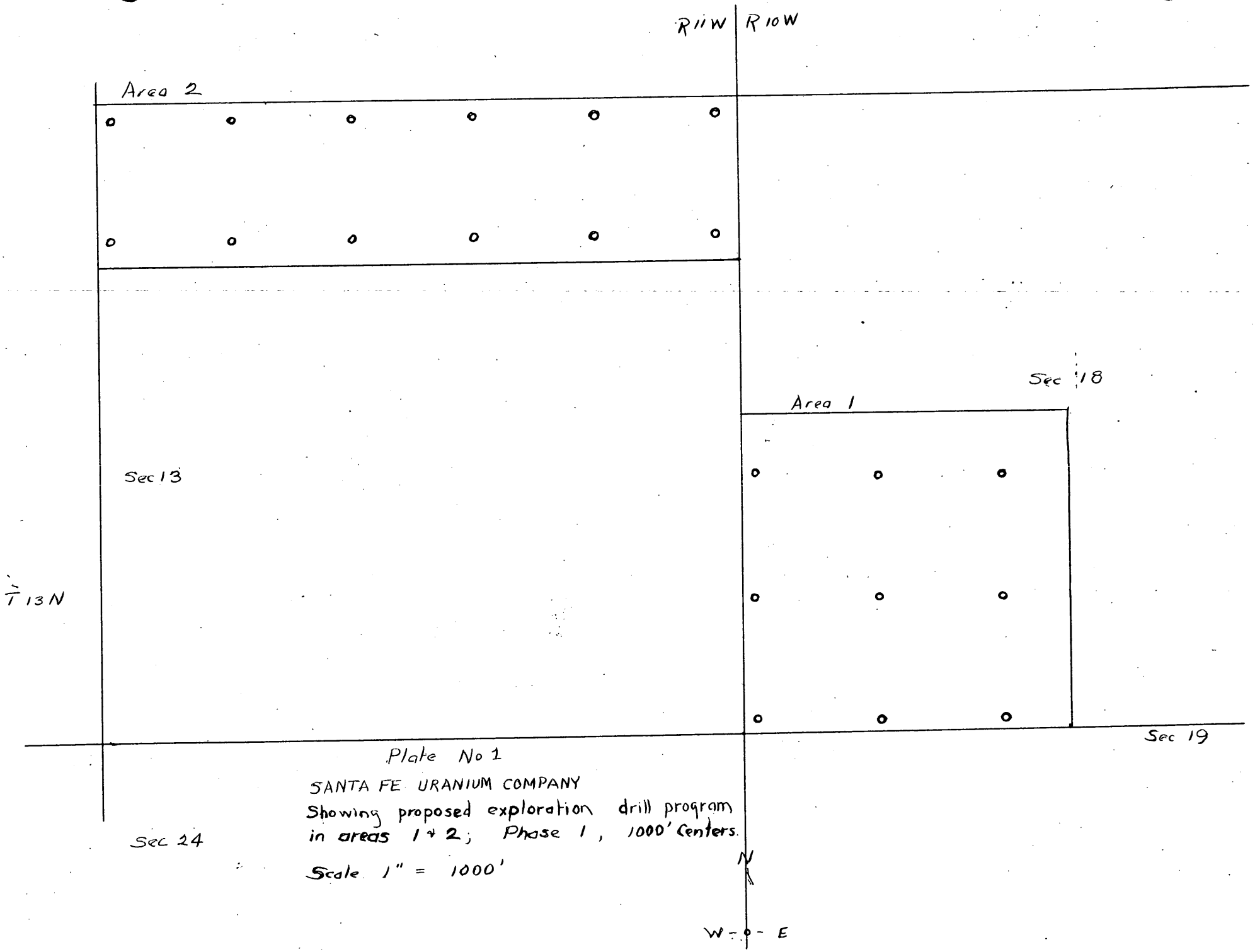


Plate No 1

SANTA FE URANIUM COMPANY

Showing proposed exploration drill program in areas 1 + 2; Phase 1, 1000' Centers.

Scale 1" = 1000'

Summary of Phases 1 and 2

A recapitulation of the drilling footages in Phases 1 and 2 are as follows:

Phase 1	Number of Holes	Feet of Coring	Feet of Plugged Drilling	Total Feet
1	21	420	8505	8925
2	37	740	16465	17205
	58	1160	24970	26130

Area (See Plate 1)	Number of Holes	Average Depth	Total Feet
1	25	383	9575
2	33	501.66	16555
	58		26130

The 26130 feet shown above for Phases 1 and 2 would represent the optimum possible footage.

Phase 3 - The maximum amount of drilling which may be required in this phase is less easily calculated than for the previous two phases. The objective of this phase is to outline any favorable ground with more closely spaced holes, in some cases this interval may be as small as 50 feet.

If we assume for calculation purposes that 50 per cent more drilling is required to establish a deposit found in Phase 1 and 2 drilling, an additional 13060 feet would be required.

Summary of Phases 1, 2 and 3

According to our estimates, a total of approximately 39190 feet of drilling will be required for this project.

(c) Time of work

The work will start within four weeks after the loan is granted, and will be completed within eight months.

(d) Operating Experience and Background of Applicant:

The project will be under the supervision of the following persons:

1. H. R. Brownson, Director and President

Education: University of Washington
Business Administration

Employment History:

Mr. Brownson has been engaged in the lumber business in Wenatchee and Seattle, Washington, for the past 25 years and has actively engaged in supplying the building industry throughout the area.

2. Hyrum Schnieder, Director and Vice-President

Doctor's Degree in Geology from University of Wisconsin
Fellow in Geological Society of America
The Mineralogical Society of America
The American Association for the Advancement of Science
Utah Academy of Science

Head of the Department of Geology at University of Utah from 1939 to 1948.

3. Lyle K. Campbell, Director

Degree in Mechanical Engineering
Masters Degree in Business Administration

Employment History:

Mr. Campbell is the manager of Construction Engineering Company and has been active in the construction business in Salt Lake City for the past four years.

4. Christopher Riley, Director

Education:

Doctor's Degree in Mining and Geology from the University of Chicago.

Employment History

Mr. Riley is a professional engineer, in charge of all exploration work for Pioneer Gold Mines (B.C.) Ltd., one of Canada's largest producers of gold.

5. A. D. Morgan, Secretary and Treasurer

Education: High School

Employment History:

Mr. Morgan has been engaged as a field representative for petroleum and mining interests in Canada for a number of years.

6. ESTIMATE OF COSTS

Costs for the project have been projected on a nine-month period for purposes of estimation, and we have used the total drilling footage of 39190 feet as a basis for calculations. These following costs, therefore, are based on a maximum figure, and for this reason the cost of the entire project will be considered as a whole.

Phases 1, 2 and 3

(a) Independent Contracts

(1)	39190 feet drilling @ $4.00 per foot	$156,760.00
(2)	Clearing drill sites, bulldozing, etc.	3,000.00
(3)	Assaying 75 samples @ $10.00 each	750.00
	Sub-Total	$160,510.00

(b) Labor, Supervision and Consultants

(1)	Common Labor 3 men @ $400 per month ($1,200 x 8)	9,600.00
(2)	Geologist ($600 per month x 8)	4,800.00
(3)	Recording Clerk ($300 per month x 8)	2,400.00
(4)	Superintendent ($800 per month x 8)	6,400.00
(5)	Consultants, Mining, Engineering and Geology	1,000.00
	Sub-Total	$24,200.00

(c)	Operating Materials and Supplies	$3,000.00
(d)	Operating Equipment	
	(1) Truck ($500 per month x 8)	4,000.00
	(2) Jeep Station Wagon ($400 per month x 8)	3,200.00
	Sub-Total	$10,200.00
(e)	Rehabilitation and Repairs	
(f)	Buildings	
	Rent of building @ $150 for 8 months	1,200.00
(g)	Miscellaneous	6,000.00

Summary of Estimated Costs

(a)	Independent Contracts	$160,510.00
(b)	Labor, Supervision and Consultants	24,200.00
(c)	Operating Materials and Supplies	3,000.00
(d)	Operating Equipment	7,200.00
(e)	Rehabilitation and Repairs	
(f)	Buildings	1,200.00
(g)	Miscellaneous	6,000.00
		$202,110.00
(h)	Add 10% for Contingencies	20,211.00
	Total Estimated Costs	$222,321,00

7. PARTICIPATION OF THE CORPORATION

The Corporation is prepared to furnish its share of the cost of the proposed project in accordance with the regulation of government participation.

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June 10, 1954

Santa Fe Uranium Company
620 Judge Building
Salt Lake City 1, Utah

Dear Sirs:

Attached you will find our report and accompanying map pertaining to the three 160 acre tracts under lease to the Santa Fe Uranium Company and located near Grants, New Mexico.

As you will note from our geological report, we feel very optimistic about the Uranium ore producing potentiality of your property.

If we can be of further service to you, please feel free to call upon us. We authorize the use of said report in connection with the public offering and offering circular to be made and used by the Company.

Sincerely yours,

GEOPROFESSIONAL SERVICES, INC.,

A. J. Eardley

A. J. Eardley

F. W. C. by NCW A. J. E.

F. W. Christiansen

Norman C. Williams

Norman C. Williams

NCW:ns
Enclosure

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REPORT ON THE SANTA FE URANIUM COMPANY PROPERTIES, GRANTS, NEW MEXICO

INTRODUCTION

The Santa Fe Uranium Company uranium properties comprise three tracts of 160 acres each. The properties are centrally located in the Grants uranium district which extends for approximately 65 miles along the southern flank of the San Juan basin between Thoreau and Correo, New Mexico. Specifically, the properties are the SW$\frac{1}{4}$, Sec. 18, T. 13 N., R. 10 W; NW$\frac{1}{4}$, Sec. 24, T. 13 N., R. 11 W.; N$\frac{1}{2}$, N$\frac{1}{2}$, Sec. 13, T. 13 N., R. 11 W.

Uranium was discovered in the Grants area in 1950, in the NE$\frac{1}{4}$, Sec 19, T. 13 N., R. 10 W., adjacent to two of the Santa Fe Uranium Company quarter-sections. Compared to other uranium districts of the Colorado Plateau, the Grants district is of relatively recent discovery and is in an early stage of development. The Grants district has not yet entered the stage of feverish land play which exists, for example, in southeastern Utah. Nevertheless, the district is well established and portends to become of major importance. Numerous new mines are being developed and the Anaconda Copper Mining Company is expanding mill facilities at Grants, New Mexico, to accommodate the increase of production of ore.

General Geology

Rocks exposed in the Grants uranium district include Triassic, Jurassic and Gretaceous formations which are mainly of continental origin. Ore has been found in the Todilto limestone, the Morrison and Dakota sandstone. Production from each of these formations has been significant and promises to increase.

The district lies mainly on the northeast flank of the Zumi uplift and the beds dip gently northward into the San Juan Basin. The hard and soft formations outcrop as cliffs and slopes, the

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harder beds, including the Todilto limestone, forming wide dip slopes. The Todilto outcrops are near the valley level and transportation and road building to the chief ore deposits have been relatively easy.

The ore consists of a variety of minerals but the outstanding characteristic is the high content of limestone that must be mined and treated to extract the uranium. This type of ore is much different from the sandstone type long mined from the Morrison formation. The new Anaconda mill which is designed specifically for limestone ores will greatly stimulate mining.

Relation of Uranium to the Todilto Limestone

The Todilto formation consists of shale, limestone and gypsum and is thought to have been deposited in a shallow arm of the sea. Uranium is known only in the limestone beds which were apparently laid down in an intermediate position between the shore where shale was deposited and the deeper central part of the basin where gypsum was formed. The limestone occurs in thin beds and is seldom over 15 feet in thickness. In many places the formation exhibits numerous small-scale folds or crenulations and is also cut by fractures and joints. Much study has been made of possible effects of the folding and jointing on the formation of ore. Ore does seem to be localized and chiefly in the folds but relatively few of the folds are mineralized. Mapping of one of the chief mineralized areas showed that five out of seven ore bodies are localized on primary folds despite the fact that these folds occupy less than 10 percent of the linear extent of the rim. No universally accepted ideas have been advanced which explain the time of origin of the ore and not much progress has been made on guides which will predict the presence of ore bodies hidden from view. In a few instances analysis of vegetation rooted in ore has helped in outlining mineralized ground but the use of the method is limited. Drilling remains the best method for proving ore and calculating reserves and so far drilling has been relatively easy since the overburden is shallow and easily penetrated.

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Analysis of the Santa Fe Uranium Company Property

Four questions must be answered as fully as possible in deciding on the value and potential of any property being considered for purchase or lease: (1) Is it in a favorable formation. (2) Is it in a mineralized district, area or "trend", (3) Does it cover ground that can be mined under present economic demands for uranium and (4) What is the previous production record and does this indicate the properties are exhausted of ore. As proved by long experience the best indication as to what may be expected on undeveloped property is what can be seen on adjacent developed ground. The grade, type of ore, and probable size of any deposit is apt to be very much like the deposits found nearby. Since the Santa Fe Uranium Company properties are mostly undeveloped their potential must be judged largely by reference to adjoining ground.

The properties are located in the Todilto formation of Jurassic age which is rated in the top four uranium producing formations in the Colorado Plateau. Uranium mineralization occurs along the outcrop of the Todilto which extends approximately 65 miles from Thoreau to near Correo, along the Santa Fe Railway. Literally scores of ore bodies have been found by surface prospecting and also by drilling and geobotanical methods. The Santa Fe Uranium Company properties include and lie adjacent to some of the better known deposits. Although many theories have been put forth to explain the localization of the ore no one theory has gained much support. The details of the various ideas need not be given here except to point out that no evidence exists which in any way casts doubt on the possibility of ore under cover back of the present known deposits. In other words all evidence favors the interpretation that the ore bodies are probably just as numerous under cover as they are at the eroded and stripped edge of the formation where they are being mined at present. This idea is vital to an evaluation of the district as a whole and in this instance particularly to the Santa Fe Uranium Company properties.

The area in the immediate vicinity of the Santa Fe Uranium Company properties is known as one of the largest producers of

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of Todilto type ore in the Grants district. This is one of the most favorable factors regarding the properties. As shown by the appended map, the two southern tracts of the Santa Fe Uranium Company property directly adjoin and partially surround the very large and productive mines of the Santa Fe Railroad Company. While some of the ground within Sec. 24 lies below the Todilto formation and has little value, some of it covers exposed Todilto and also thinly covered favorable ground. In fact this area has, as of April 30, 1954, already produced ore having a value of $301,932.81 and has not been fully explored. The tract in Sec. 18 of the area appears to have cover which can be economically removed if ore is being followed or has been located by drilling. The northern tract, in Sec. 13 has deeper cover but the productive formation is still within the range of economic development.

PRODUCTION DATA
(to May 1, 1954)

SW$\frac{1}{4}$, Sec. 18, T. 13 N., R. 10 W.
Average U_3O_8 content $\not{/}$0.23--value $45,813.18

NE$\frac{1}{4}$, Sec. 24, T. 13 N., R. 11 W.
Average U_3O_8 content $\not{/}$0.23--value $301,932.81

ORE RESERVES

On April 30, stripping operations had exposed a bench of ore-grade Todilto limestone which was measured and calculated to contain 17,000 to 20,000 tons of ore. Since this date, the chief activity has consisted of drilling to determine the trends of known ore bodies and to establish new reserves. On June 5, 1954, 45 drill holes had been completed and these were examined and tested with the Geiger probe to determine the tenure and tonnage of newly found ore. The 45 drill holes are spaced from 15 to 23 feet apart and have tested an area comprising 36,800 square feet. Of the 45 drill holes, 8 had collapsed and no data were obtainable. The remaining 37 holes were all in mineralized formation and indicated

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ore ranging from .20% U_3O_8 to 1.80% U_3O_8. Thickness of the ore bearing bed ranges from 10 to 20 inches. The 36,800 square foot areas averages 1 foot of .40% U_3O_8 ore which reduced to an optimum grade of .21% U_3O_8 would permit of approximately a two foot mineable zone containing about 6,500 tons. This 6,500 tons represents a reserve of mineable ore which is in addition to the 17,000 to 20,000 tons of exposed ore.

To date, the ore on the Santa Fe Uranium Company properties, and on large adjacent ore bodies has demonstrated a remarkably uniform grade. The average U_3O_8 content ranges from 0.20 to 0.26. Higher and lower content is present, but for overall economy, the operators seek to maintain an average shipping grade of 0.21 to 0.24% U_3O_8.

SUMMARY

The Santa Fe Uranium Company properties are considered favorable for the production of uranium ore on a profitable basis for the following reasons.

(1) They are located on the productive Todilto limestone and cover structures (folds) and types of rock that are favorable to ore formations by all known criteria.

(2) They are in geographically favorable territory. The SW¼, Sec. 18 and NW¼, Sec. 24 are immediately adjacent to the large and highly productive tracts owned by the Santa Fe Railroad Company. Production from these adjacent tracts has averaged over 200 tons of ore per day for more than one year.

(3) To date, mining has been from easily discovered surface exposures and has chiefly "followed the ore." Much untested ground remains to be explored.

(4) Drill holes have encountered ore in the SW¼, SW¼, Sec. 18.

(5) The uniform tenure of the ore, demonstrated ore reserves, close proximity to milling facilities, and ease of mining are features which contribute to the economic attractiveness of the Santa Fe Uranium Company properties.

Submitted by,
GEOPROFESSIONAL SERVICES, INC.,

A. J. Fardley

F. W. Christiansen

Norman C. Williams

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DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
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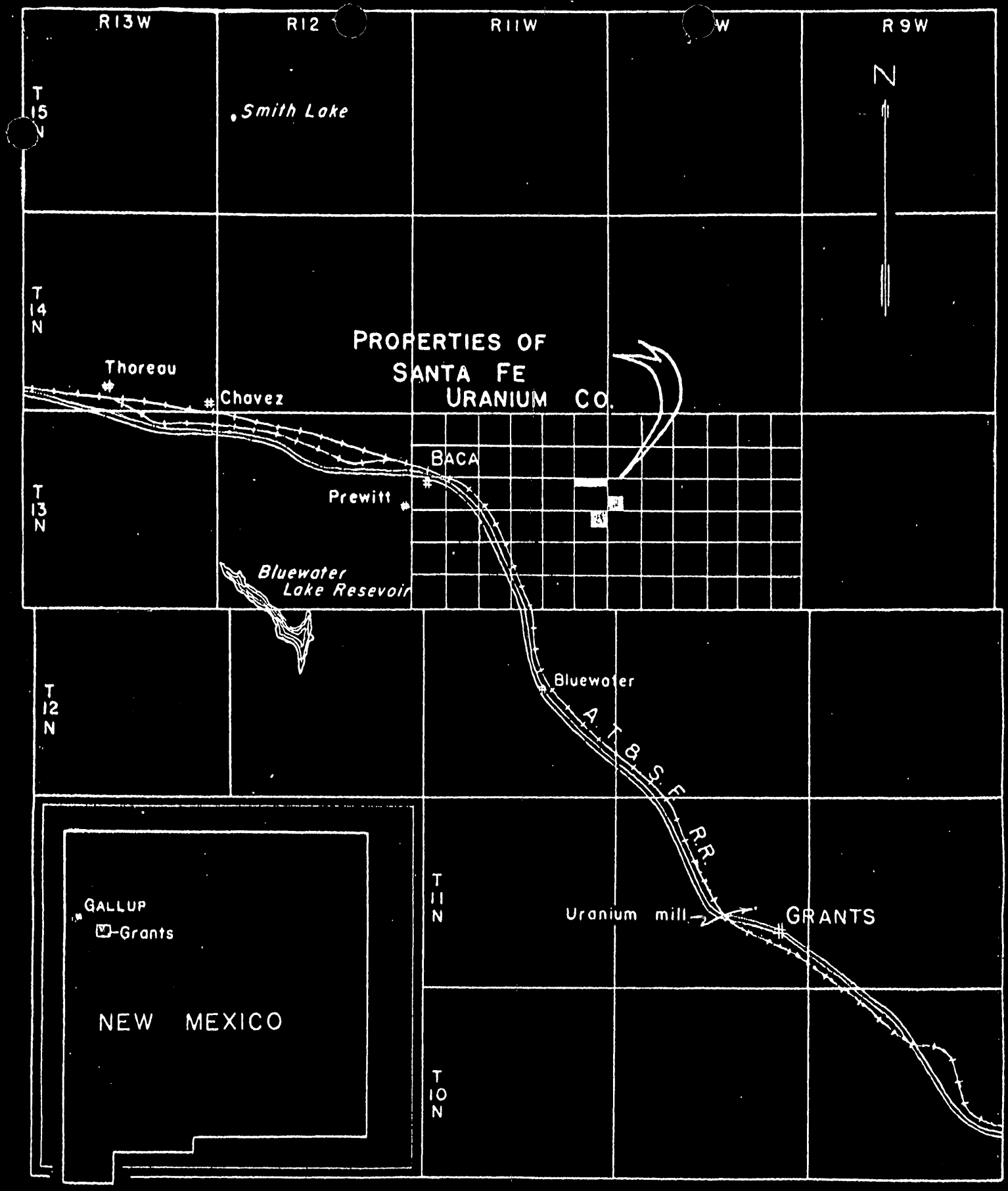
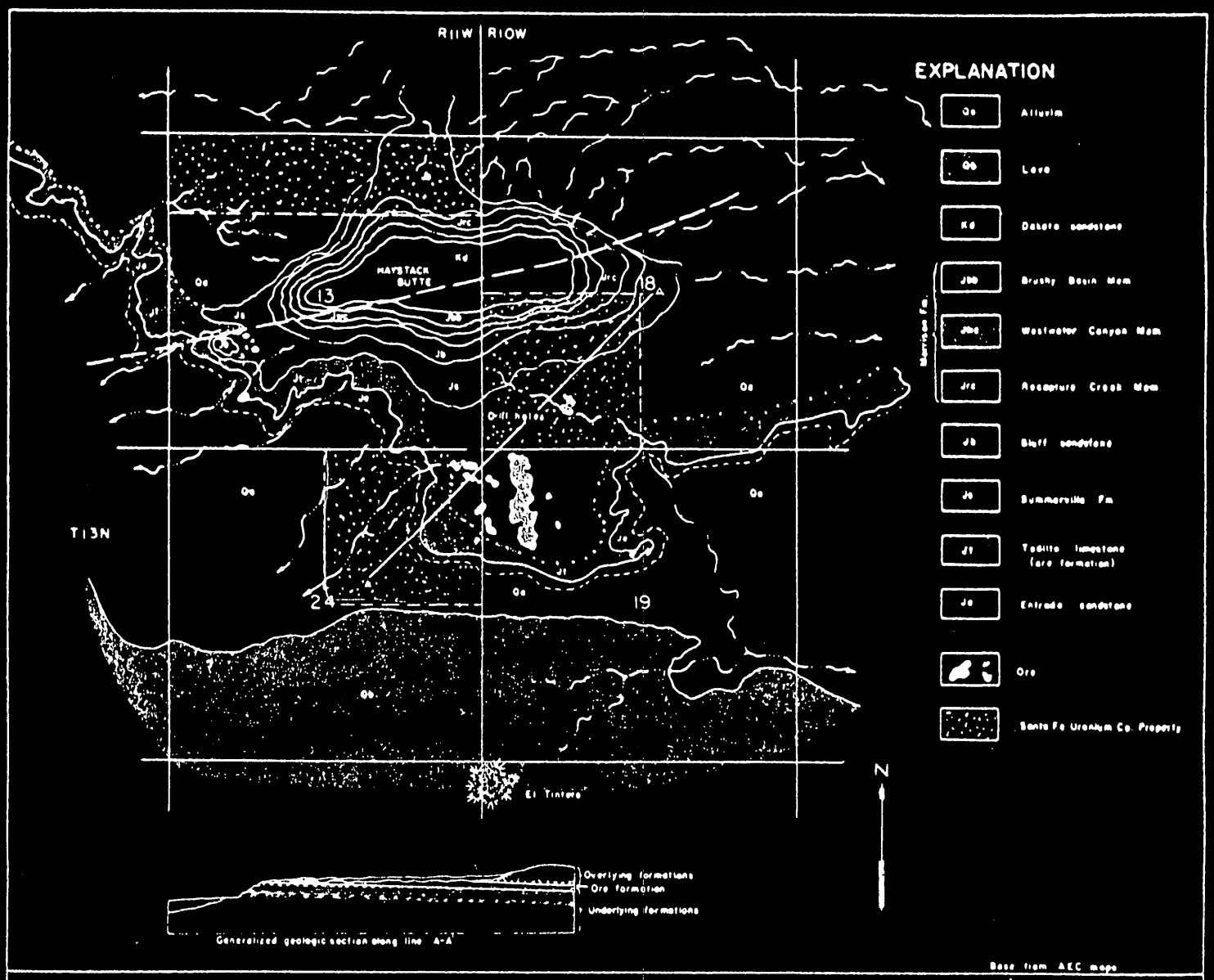


INDEX MAP SHOWING LOCATION
OF THE
SANTA FE URANIUM COMPANY NEW MEXICO

SCALE

1 3/4 1/2 1/4 0 mile

GEOPROFESSIONAL
SERVICES, INC.



GEOLOGIC MAP
of
SANTA FE URANIUM CO. PROPERTIES NEAR GRANTS, N.M.

Area of Adjoining

SCALE

1000 0 1/4 1/2 3/4 mile

GEOPROFESSIONAL SERVICES INC.

1311 WALKER BANK BUILDING, SALT LAKE CITY, UTAH

A G R E E M E N T

THIS AGREEMENT made and entered into this 21ST day of May, 1954, by and between GLENN D. WILLIAMS and EDITH A. WILLIAMS, his wife, of Gallup, New Mexico, hereinafter referred to as "First Parties", and SANTA FE URANIUM COMPANY, INC., a Utah corporation, hereinafter referred to as "second Party",

W I T N E S S E T H

WHEREAS, First Parties are the owners of assigned mining leases which are attached hereto and made a party hereof and which are identified as Exhibits A, B, and C, being assigned mining leases covering lands in the County of McKinley (Eastern Navajo) in the State of New Mexico, more particularly described as follows, to wit:

1. Lease from Non a bah Vandever, being Contract No. I-149-Ind-8912, covering NE¼ of Section 24, Township 13 North, Range 11 West, N.M.P.M., said Lease having been recorded in Book 8 of Leases, Page 146 of the Records in the office of the County Clerk of McKinley County, N.M., and

2. Lease from Brown Vandever, being Contract No. I-149-Ind-8913, covering Lots 3 & 4 and E½ SW¼ of Section 18, Township 13 North, Range 10 West, N.M.P.M. said Lease having been recorded in Book 8 of Leases, page 154 of said records, and

3. Lease from Walter Vandever, being Contract No. I-149-Ind-8911, covering N½N½ of Section 13, Township 13 North, Range 11 West, N.M.P.M., said Lease having been recorded in Book 8 of Leases, Page 162 of said records; and

WHEREAS, J. T. HUTTON and PARALEE HUTTON, his wife, have assigned, executed and delivered to First Parties proper assign-

ments of their interest in and to the aforesaid mining lease contracts on the forms provided therefor by the Bureau of Indian Affairs, and

WHEREAS, said assignments have been approved by the Bureau of Indian Affairs and

WHEREAS, First Parties have agreed to pay to the aforesaid J. T. Hutton or his assigns a three percent (3%) royalty on all uranium ores mined and milled from said properties as shown in the attached Agreement and identified as Exhibit "D", and

WHEREAS, First Parties desire to assign to Second Party all of its right and interest remaining in the foregoing leases identified as contract Nos. I-149-Ind-8911, I-149-Ind-8912 and I-149-Ind-8913, subject to the approval of the Bureau of Indian Affairs and subject to a three percent (3%) royalty payable to J. T. Hutton or his assigns, and

WHEREAS, the Second Party desires to purchase the same for the sum of Three Hundred Thousand Dollars ($300,000.00);

NOW THEREFORE, it is mutually agreed by and between the parties as follows, to wit:

1. Second Party will place in escrow on or before the 24th day of May, 1954, at the First State Bank of Gallup, New Mexico, Twenty Thousand Dollars ($20,000.00), which sum will be payable to the First Parties upon delivery to the said Bank by the First Parties of a properly assigned lease or properly assigned leases approved by the Bureau of Indian Affairs, transferring to Second Party the interest now held by First Parties in and to the properties herein described and referred to in the leases identified as Nos. I-149-Ind-8911, I-149-Ind-8912 and I-149-Ind-8913.

2. Second Party agrees to pay to First Parties an additional Fifty Thousand Dollars ($50,000.00) within sixty (60) days from the date of the Bureau of Indian Affairs approves the assignment from First Parties to Second Party of the foregoing described properties.

3. Second Party agrees to pay the remaining Two Hundred Thirty Thousand Dollars ($230,000.00) of the purchase price out of mining operations as follows, to wit:

   a. One Hundred Thousand Dollars ($100,000.00) on or before January 15, 1955 to be paid from escrow funds deposited in the First State Bank of Gallup, New Mexico, accumulated from ores milled and mined from the foregoing premises on the basis of Six Dollars ($6.00) per dry ton. Second Party further agrees to secure the minimum payment of the aforesaid One Hundred Thousand Dollars ($100,000.00) by promissory notes made on the basis of Four Dollars ($4.00) per dry ton of all ores milled and mined from said premises, said notes to be payable on or before January 15, 1955.

      In the event there is an accumulation of escrow funds in the amount of One Hundred Thousand Dollars ($100,000.00) before January 15, 1955, First Parties shall at their option have the right to receive said sum prior to the 15th day of January, 1955. In the event said escrow funds exceed the sum of One Hundred Thousand Dollars ($100,000.00) prior to January 15, 1955, said accumulations in excess of One Hundred Thousand Dollars ($100,000.00) shall be retained in escrow to secure the payment of the second One Hundred Thirty Thousand Dollars ($130,000.00) as hereinafter provided in paragraph 3 (b) herein.

   b. One Hundred Thirty Thousand Dollars ($130,000.00) on or before January 15, 1956, payable out of funds accumulated in escrow on the basis of Six Dollars ($6.00) per dry ton, together with Second Party's promissory note payable to First Parties in the amount of Four Dollars ($4.00) per dry ton payable on or before January 15, 1956.

      In the event there is an accumulation of escrow funds in the amount of One Hundred Thirty Thousand Dollars ($130,000.00) before January 15, 1956, First Parties shall at their option have the right to receive said sum prior to the 15th day of January, 1956.

c. The foregoing payments shall be made on or before the due dates thereof, and are not to be deemed conditioned on the existence of sufficient funds in escrow from ore production to make such payments.

4. It is understood and agreed by and between the undersigned that the balance of the purchase price as herein provided shall not bear interest.

5. It is understood and agreed by and between the parties hereto that Second Party will undertake and pay to J. T. Hutton the three percent (3%) royalty which First Parties are now obligated to pay to the said J. T. Hutton from any uranium ores mined from the aforesaid properties, as shown in the attached Agreement identified herein.

6. It is understood and agreed by and between the undersigned that the Second Party will assume and undertake to pay to the GEOPROFESSIONAL SERVICES, INC. any sums which may be due and owing to them from the First Parties by reason of the services of the GEOPROFESSIONAL SERVICES, INC. in rendering services and assisting the First Parties in disposing of their properties.

7. In the event the First Parties are unable to secure, within sixty (60) days, approval from the Bureau of Indian Affairs of the assignment from the First Parties to the Second Party of the foregoing leases, then in that event, said Second Party shall be entitled to a refund to them of Twenty Thousand Dollars ($20,000.00) placed in escrow as herein provided and the parties hereto shall be relieved thereafter of any obligation incurred by reason of this agreement.

8. It is understood and agreed by and between the undersigned that pending the approval from the Bureau of Indian Affairs of the assignments herein referred to, First Parties shall have the right to mine and stockpile ores on the premises and that Second Party shall pay to First Parties the reasonable cost of said operations during said period. Second Party shall be entitled to the proceeds received from all of said ores, subject to the provisions of this lease as herein stated.

9. It is understood and agreed by and between the undersigned that in the event the Second Party becomes in default in any of the payments as herein provided, that the First Parties shall notify the Second Party by registered mail of such default and that in the event said Second Party does not place the contract in good standing by making up the default payments as herein provided for within thirty (30) days from receipt of said notice, said First Parties shall have the immediate right to terminate said contract

I declare the said sums paid herein forfeited as liquidated damage.

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

Glenn D. Williams (Seal)
Glenn D. Williams

Edith A. Williams (Seal)
Edith A. Williams

SANTA FE URANIUM COMPANY

By _____
Its President

STATE OF NEW MEXICO)
: ss.
County of McKinley)

On this 26th day of May, 1954, before me personally appeared Glenn D. Williams and Edith A. Williams, husband and wife, to me known to be the persons described in and who executed the foregoing instrument and acknowledged that they executed the same. Witness my hand and seal the day and year above written.

John E Terry
Notary Public
Residing at: Gallup, N.M.

My Commission Expires:
12/30/54

STATE OF UTAH)
: ss.
County of Salt Lake)

On this 21st day of May, 1954, before me personally appeared [illegible], President of the Santa Fe Uranium Company, to me known to be the person described in and who executed the foregoing instrument on behalf of the Santa Fe Uranium Company and acknowledged that he executed the same as a free act and deed of the Santa Fe Uranium Company and that he was duly authorized by resolution of the said company to execute said instrument. Witness my hand and seal the day and year above written.

[illegible]
Notary Public

Residing at: Salt Lake City, Ut.

My Commission Expires:

April 16, 1957

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 16 1955

6-1640
(May 1949)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

CONTRACT NO.
I-149-Ind-6912

ASSIGNMENT OF MINING LEASE

WHEREAS, the Secretary of the Interior has heretofore approved Uranium mining lease, dated the 7th day of June, 1951, entered into by and between NON AL BAH VALDEVEZ, Navajo Indian Allotted 059419, lessor, and GLENN D. WILLIAMS and J. F. HUTTON, lessee, covering the following-described lands in the County of McKinley (Eastern Navajo) (Insert name of Reservation, Pueblo, Nation, etc., as needed) in the State of New Mexico, to wit:

The North East Quarter of
Section 24
Township 13 North, Range 11 West, N.M.P.M.
Containing 160 Acres

BUREAU OF INDIAN AFFAIRS
RECEIVED
JUL 6 1954
9936
Washington D.C.

NOW, THEREFORE, for and in consideration of One and no/100 dollars ($1.00), the receipt of which is hereby acknowledged, the said Glenn D. Williams (assignee of J. F. Hutton and Pauline Hutton, his wife) (where also Edith A. Williams joins herein the execution hereof) the owner of the above-described lease, hereby bargains, sells, transfers, assigns, and conveys All their right, title, and interest in and to said lease, and all their right, title and interest in and to the land therein described

subject to the approval of the Secretary of the Interior, to Santa Fe Uranium Company, of Salt Lake City, Utah

Said assignment to be effective from date of approval hereof by the Secretary of the Interior.

IN WITNESS WHEREOF, the said assignor has hereunto set our hand and seal, this 23rd day of June, 1954

Glenn D. Williams
Edith A. Williams

16—11683-2

[OVER]

ACKNOWLEDGMENT OF CORPORATION

STATE OF _____ } ss.
COUNTY OF _____

Before me, a notary public, in and for said county and State on this _____ day of _____, 19____, personally appeared _____ to me known to be the identical person who subscribed the name of the maker thereof to the foregoing instrument as its _____ and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

My commission expires _____ 19____ *Notary Public.*

ACKNOWLEDGMENT OF INDIVIDUAL

STATE OF New Mexico
COUNTY OF McKinley } ss.

Before me, a notary public, in and for said county and State, on this 23rd day of June, 1954 personally appeared GLENN D. WILLIAMS and EDITH A. WILLIAMS, his wife, to me known to be the identical persons who executed the within and foregoing instrument, and acknowledged to me that they executed the same as their free and voluntary act and deed for the uses and purposes therein set forth.

My commission expires December 30, 1954 *Notary Public.*

ACCEPTANCE BY ASSIGNEE

The assignee in the above and foregoing assignment, made subject to the approval of the Secretary of the Interior, hereby accepts such assignment and agrees to fulfill all the obligations, conditions, and stipulations in said described indenture of lease, when assigned, and the rules and regulations of the Secretary of the Interior applicable thereto, and to furnish proper bond guaranteeing a faithful compliance with said lease and this agreement.

IN WITNESS WHEREOF, the said assignee has hereunto set our hand and seal this 23rd day of June, 1954.

SANTA FE URANIUM COMPANY

ATTEST: By Noland H. S. Schneider
Vice President

Secretary

CONSENT OF SURETY

The CENTRAL SURETY AND INSURANCE CORPORATION, of Kansas City, Missouri, surety for Glenn D. Williams on the bond accompanying the lease above described, hereby consents to the assignment and transfer of said lease as above made and agrees that said bond shall remain in force and effect covering obligations of assignee.

Dated at Kansas City, Missouri this 11th day of June, 1954

CENTRAL SURETY AND INSURANCE CORPORATION

By J. F. Daniels
Attorney-in-Fact

CENTRAL SURETY CORPORATION
RECEIVED JUN 10 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR,
Washington, D. C., JUL - 9 1954

APPROVED: (Sgd) H. M. CHITCHFIELD
~~Commissioner~~ *of Indian Affairs.*
Chief, Branch of Realty

Approved under authority
by Secretarial Order No.
January 11, 1949 (14 F.R. 2
and Order No. 551, Amendment 7
(19 F.R. 1826).

U. S. GOVERNMENT PRINTING OFFICE

Form 5-154
(October 1939)

CONTINUATION SHEET

Contract No.
I-149-Ind-8912

MINING LEASE ALLOTTED INDIAN LANDS
(For Minerals other than Oil and Gas)

The Lessee hereby agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, as royalty, the sums of money as follows:

Percentage Royalty Schedule

Mine Value Per Dry Ton	Royalty Percentage of Mine Value Per Dry Ton
$ 0.01 to $ 10.01	10%
$ 10.01 to $ 20.01	11%
$ 20.01 to $ 30.01	12%
$ 30.01 to $ 40.01	13%
$ 40.01 to $ 50.01	14%
$ 50.01 to $ 60.01	15%
$ 60.01 to $ 70.01	16%
$ 70.01 to $ 80.01	17%
$ 80.01 to $ 90.01	18%
$ 90.01 to $100.01	19%
$100.01 or more	20%

"MINE VALUE PER DRY TON", wherever used herein is hereby defined as the dollar value per dry ton of crude ores at the mine as paid for by the Atomic Energy Commission or other government agency before allowance for transportation and development; however, if the government at any time hereafter does not establish and pay for said ores on a fixed or scheduled dollar value per dry ton of crude ores at the mine, or said ores contain saleable minerals, some, or all, of which are disposed of to a custom treatment plant or smelter for treatment and sale, then mine value per dry ton shall be the gross value per dry ton of said crude ore as paid for by the Atomic Energy Commission or other government authorized agency mill or other buyer, less any allowances or reimbursements for the following specific items: (1) transportation of ores; (2) allowances for exploration for, or development of ores; and (3) treatment or beneficiation of ores; which specific items shall in such event be deducted from the gross sales price received from the metal content of said ores by the seller before said percentage royalty is calculated and paid. Such payments shall be made on or before the fifteenth (15th) day of the month next following receipt by Lessee of payment for said ores together with a statement of the mine value of said ores and the amount of royalty due on each lot shipped and sold.

In addition to the above royalty payments there shall be paid to the Superintendent for the use and benefit of the Lessor 10% of any bonus paid by the United States Atomic Energy Commission for the production of ore from the above lease and particularly bonuses for the initial production of uranium ore from said lease. But this provision shall not be limited to bonuses for initial production but shall apply to any and all bonuses paid for the production of ore.

Nona Lee Vandever
Witness:
M. D. Long
Ruby Foster

150

Annual Rental

The Lessee agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, in advance beginning with the date of approval of the lease as annual rental, the sum of One ($1.00) Dollar per acre for the first calendar year and the sum of One ($1.00) Dollar per acre, in advance, for each and every calendar year thereafter during the continuation of this lease.

The rentals so paid shall not be a credit on the royalties accruing under this lease and shall not be refunded to the Lessee because of any subsequent surrender or cancellation of the lease.

Development

The land described herein shall not be held by the Lessee for speculative purposes but in good faith for mining mineral specified. The Lessee shall expend in the development of said lease in each year the sum of Ten ($10.00) Dollars per acre. Such development shall consist of road building, prospecting or drilling and mining operations, and the Lessee shall each year submit to the Superintendent satisfactory reports regarding development expenditures, which reports shall be furnished within ten (10) days after the yearly anniversary date of the lease; and failure by the Lessee in the diligent development and continued operation of the mine or mines, or the expenditures of the sum provided herein for the development of said lease in each year except when the operations may be interrupted by strikes, the elements or casualties not attributable to the Lessee, shall be held as want of compliance with the purposes of this lease and shall render it subject to cancellation; provided that whenever the Secretary of the Interior shall consider the marketing facilities inadequate or economical conditions unsatisfactory he may authorize the suspension of operations for such time as he may deem advisable but such action will not release the Lessee from the payment of the advance annual rental.

Payment for Surface Damage

The Lessee shall pay to the Superintendent for the use and benefit of the Lessor, as damage to the surface of the lands covered by this lease, Ten ($10.00) Dollars per acre for each acre of land upon which the vegetation of any kind is destroyed or on which the top soil may be removed, turned or damaged by the mining operations conducted on said lease, but not including the reasonable use of the surface for roads and the construction of facilities for the operation of this lease. Provided, however, that in the event the royalty payments made under this lease shall equal or exceed the amount due for surface damages as provided in this paragraph then and in that event the Lessee shall be released from the obligation to pay such surface damages.

4

The Lessee shall not be permitted to surrender or terminate this lease until the damages provided for in this paragraph have been paid and in the event of the cancellation or forfeiture of this lease by the Secretary of the Interior as provided in said lease, the Lessee shall remain obligated to pay for surface damages as herein provided and the bondsmen of the Lessee shall not be released from liability until such surface damages are paid. The extent of the surface damages and the amount due therefor, shall be determined by the Secretary of the Interior.

The lessee shall employ Navajo labor in all positions for which they are qualified, including truck drivers, and shall protect the Indian grazing rights and other Indian rights to the surface of the lands.

The lessee shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and shall require an identical provision to be included in all subcontracts hereunder.

Two witnesses to signature of Lessee

M. D. Long

Ruby Foster

Lessee

L. J. Hutton

(~~Attest~~)

her mark

Two witnesses to signature of Lessor

M. D. Long

Ruby Foster

Nez-a-bah Vanderer

Lessor

Lessor

Lessor

Lessor

Lessor

Lessor

5-154c
(May 1949)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

DEC - 8 1953

CONTRACT NO.
I-149-Ind-8913

ASSIGNMENT OF MINING LEASE

WHEREAS, the Secretary of the Interior has heretofore approved Uranium mining lease, dated the 7 day of June, 19 51, entered into by and between Brown Vandever, Allottee 077031, lessor, and Glenn D. Williams and J. T. Hutton, lessee, covering the following-described lands in the County of McKinley (Eastern Navajo) (Insert name of Reservation, Pueblo, Nation, etc., as needed) in the State of New Mexico, to-wit:

Lots 3, 4, E½ SW¼ of
Section 18,
Township 13 North, Range 10 West, N.M.P.M.
Containing 163.38 acres

BUREAU OF INDIAN AFFAIRS
RECEIVED
NOV 16 1953
17381
Washington, D. C.

NOW, THEREFORE, for and in consideration of One and no/100 dollars ($ 1.00), the receipt of which is hereby acknowledged, the said J. T. Hutton, together with Parallee Hutton, his wife, two of the owner~~s~~ of the above-described lease, hereby bargain~~s~~, sell~~s~~, transfer~~s~~, assign~~s~~, and convey~~s~~ all of their right, title, and interest in and to said lease, and all of their right, title and interest in and to the land therein described, subject to the approval of the Secretary of the Interior, to Glenn D. Williams, of Gallup, New Mexico

Said assignment to be effective from date of approval here~~by~~of by the Secretary of the Interior.

IN WITNESS WHEREOF, the said assignor~~s~~ have hereunto set their hand~~s~~ and seal~~s~~ this 26th day of January, 19 53

J. T. Hutton (Seal)
Parallee Hutton (Seal)

16—11683-2

[OVER]

ACKNOWLEDGMENT OF CORPORATION

STATE OF .....
COUNTY OF ..... } ss:

Before me, a notary public, in and for said county and State on this ..... day of ....., 19..... personally appeared ..... to me known to be the identical person who subscribed the name of the maker thereof to the foregoing instrument as its ..... and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

My commission expires ....., 19..... .....
Notary Public.

ACKNOWLEDGMENT OF INDIVIDUAL

STATE OF New Mexico
COUNTY OF McKinley } ss:

Before me, a notary public, in and for said county and State, on this 5th day of February, 1953 personally appeared J. T. Hutton and Parallee Hutton, husband and wife ....., to me known to be the identical persons who executed the within and foregoing instrument, and acknowledged to me that they executed the same as their free and voluntary act and deed for the uses and purposes therein set forth.

My commission expires 5/28, 1953 .....
Notary Public.

ACCEPTANCE BY ASSIGNEE

The assignee in the above and foregoing assignment, made subject to the approval of the Secretary of the Interior, hereby accepts such assignment and agrees to fulfill all the obligations, conditions, and stipulations in said described indenture of lease, when assigned, and the rules and regulations of the Secretary of the Interior applicable thereto, and to furnish proper bond guaranteeing a faithful compliance with said lease and this agreement.

IN WITNESS WHEREOF, the said assignee has hereunto set his hand and seal this 5th day of February, 1953

..... (Seal)
.....
.....

CONSENT OF SURETY

The ....., of ....., surety for ..... on the bond accompanying the lease above described, hereby consents to the assignment and transfer of said lease as above made and agrees that said bond shall remain in force and effect covering obligations of assignee.

Dated at ..... this ..... day of ....., 19.....

.....
.....
.....

UNITED STATES
DEPARTMENT OF THE INTERIOR,

Washington, D. C., DEC 8 1953

APPROVED:

(Sgd) E. L. ORTZ
Assistant *Commissioner of Indian Affairs.*

16—11683-2 U. S. GOVERNMENT PRINTING OFFICE

7

Form 5-154
(October 1939)

CONTINUATION SHEET

Contract No.
I-149-Ind-8913

MINING LEASE ALLOTTED INDIAN LANDS
(For Minerals other than Oil and Gas)

The Lessee hereby agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, as royalty, the sums of money as follows:

Percentage Royalty Schedule

Mine Value Per Dry Ton	Royalty Percentage of Mine Value Per Dry Ton
$ 0.01 to $ 10.01	10%
$ 10.01 to $ 20.01	11%
$ 20.01 to $ 30.01	12%
$ 30.01 to $ 40.01	13%
$ 40.01 to $ 50.01	14%
$ 50.01 to $ 60.01	15%
$ 60.01 to $ 70.01	16%
$ 70.01 to $ 80.01	17%
$ 80.01 to $ 90.01	18%
$ 90.01 to $100.01	19%
$100.01 or more	20%

"MINE VALUE PER DRY TON", wherever used herein is hereby defined as the dollar value per dry ton of crude ores at the mine as paid for by the Atomic Energy Commission or other government agency before allowance for transportation and development; however, if the government at any time hereafter does not establish and pay for said ores on a fixed or scheduled dollar value per dry ton of crude ores at the mine, or said ores contain saleable minerals, some, or all, of which are disposed of to a custom treatment plant or smelter for treatment and sale, then mine value per dry ton shall be the gross value per dry ton of said crude ore as paid for by the Atomic Energy Commission or other government authorized agency mill or other buyer, less any allowances or reimbursements for the following specific items: (1) transportation of ores; (2) allowances for exploration for, or development of ores; and (3) treatment or beneficiation of ores; which specific items shall in such event be deducted from the gross sales price received from the metal content of said ores by the seller before said percentage royalty is calculated and paid. Such payments shall be made on or before the fifteenth (15th) day of the month next following receipt by Lessee of payment for said ores together with a statement of the mine value of said ores and the amount of royalty due on each lot shipped and sold.

In addition to the above royalty payments there shall be paid to the Superintendent for the use and benefit of the Lessor 10% of any bonus paid by the United States Atomic Energy Commission for the production of ore from the above lease and particularly bonuses for the initial production of uranium ore from said lease. But this provision shall not be limited to bonuses for initial production but shall apply to any and all bonuses paid for the production of ore.

Annual Rental

The Lessee agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, in advance beginning with the date of approval of the lease as annual rental, the sum of One ($1.00) Dollar per acre for the first calendar year and the sum of One ($1.00) Dollar per acre, in advance, for each and every calendar year thereafter during the continuation of this lease.

The rentals so paid shall not be a credit on the royalties accruing under this lease and shall not be refunded to the Lessee because of any subsequent surrender or cancellation of the lease.

Development

The land described herein shall not be held by the Lessee for speculative purposes but in good faith for mining mineral specified. The Lessee shall expend in the development of said lease in each year the sum of Ten ($10.00) Dollars per acre. Such development shall consist of road building, prospecting or drilling and mining operations, and the Lessee shall each year submit to the Superintendent satisfactory reports regarding development expenditures, which reports shall be furnished within ten (10) days after the yearly anniversary date of the lease; and failure by the Lessee in the diligent development and continued operation of the mine or mines, or the expenditures of the sum provided herein for the development of said lease in each year except when the operations may be interrupted by strikes, the elements or casualties not attributable to the Lessee, shall be held as want of compliance with the purposes of this lease and shall render it subject to cancellation; provided that whenever the Secretary of the Interior shall consider the marketing facilities inadequate or economical conditions unsatisfactory he may authorize the suspension of operations for such time as he may deem advisable but such action will not release the Lessee from the payment of the advance annual rental.

Payment for Surface Damage

The Lessee shall pay to the Superintendent for the use and benefit of the Lessor, as damage to the surface of the lands covered by this lease, Ten ($10.00) Dollars per acre for each acre of land upon which the vegetation of any kind is destroyed or on which the top soil may be removed, turned or damaged by the mining operations conducted on said lease, but not including the reasonable use of the surface for roads and the construction of facilities for the operation of this lease. Provided, however, that in the event the royalty payments made under this lease shall equal or exceed the amount due for surface damages as provided in this paragraph then and in that event the Lessee shall be released from the obligation to pay such surface damages.

9

The Lessee shall not be permitted to surrender or terminate this lease until the damages provided for in this paragraph have been paid and in the event of the cancellation or forfeiture of this lease by the Secretary of the Interior as provided in said lease, the Lessee shall remain obligated to pay for surface damages as herein provided and the bondsmen of the Lessee shall not be released from liability until such surface damages are paid. The extent of the surface damages and the amount due therefor, shall be determined by the Secretary of the Interior.

The lessee shall employ Navajo labor in all positions for which they are qualified, including truck drivers, and shall protect the Indian grazing rights and other Indian rights to the surface of the lands.

The lessee shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and shall require an identical provision to be included in all subcontracts hereunder.

Two witnesses to signature of Lessee

M. D. Long

[illegible]

[illegible]
Lessee

[illegible]
(Attest)

Two witnesses to signature of Lessor

M. D. Long

[illegible]

his mark

Beowa Vandever
Lessor

Lessor

Lessor

Lessor

Lessor

Lessor

RECEIVED

5-154a
(May 1949)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

Contract No. [illegible]

ASSIGNMENT OF MINING LEASE

WHEREAS, the Secretary of the Interior has heretofore approved Uranium mining lease, dated the 7 day of June, 1951, entered into by and between Walter Vandever, Allottee [illegible] lessor, and Glenn D. Williams and J. T. Hutton, lessee, covering the following-described lands in the County of McKinley (Eastern Navajo) (Insert name of Reservation, Pueblo, Nation, etc., as needed) in the State of New Mexico, to-wit:

The North half of North half of Section 13, Township 13 North, Range 11 West, N.M.P.M.

Containing 160 acres

BUREAU OF INDIAN AFFAIRS RECEIVED NOV 16 1953 17379 Washington, D.C.

NOW, THEREFORE, for and in consideration of One and no/100 dollars ($1.00), the receipt of which is hereby acknowledged, the said J. T. Hutton, together with Parallee Hutton, his wife, two of the owner of the above-described lease, hereby bargain, sell, transfer, assign, and convey all of their right, title, and interest in and to said lease, and all of their right, title and interest in and to the land therein described,

subject to the approval of the Secretary of the Interior, to Glenn D. Williams, of Gallup, New Mexico

Said assignment to be effective from date of approval hereof by the Secretary of the Interior.

IN WITNESS WHEREOF, the said assignor have hereunto set their hand and seal, this 26th day of January, 1953

J. T. Hutton (Seal)
Parallee Hutton (Seal)

16-11683-2

[OVER]

ACKNOWLEDGMENT OF CORPORATION

STATE OF .....
COUNTY OF ..... } ss:

Before me, a notary public, in and for said county and State on this ..... day of ....., 19.....
personally appeared .....
to me known to be the identical person who subscribed the name of the maker thereof to the foregoing instrument as its
..... and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

My commission expires ....., 19..... .....
Notary Public.

ACKNOWLEDGMENT OF INDIVIDUAL

STATE OF New Mexico
COUNTY OF McKinley } ss:

Before me, a notary public, in and for said county and State, on this 5th day of February, 1953
personally appeared
J. T. Hutton and Parallee Hutton, husband and wife
, to me known to be the identical persons who executed the within and foregoing instrument, and acknowledged to me that they executed the same as their free and voluntary act and deed for the uses and purposes therein set forth.

My commission expires 5-29, 1953 .....
Notary Public.

ACCEPTANCE BY ASSIGNEE

The assignee in the above and foregoing assignment, made subject to the approval of the Secretary of the Interior, hereby accepts such assignment and agrees to fulfill all the obligations, conditions, and stipulations in said described indenture of lease, when assigned, and the rules and regulations of the Secretary of the Interior applicable thereto, and to furnish proper bond guaranteeing a faithful compliance with said lease and this agreement.

IN WITNESS WHEREOF, the said assignee has hereunto set his hand and seal this 5th day of February, 1953

..... (Seal)
.....
.....

CONSENT OF SURETY

The .....
..... , of
..... , surety for .....
..... on the bond accompanying the lease above described, hereby consents to the assignment and transfer of said lease as above made and agrees that said bond shall remain in force and effect covering obligations of assignee.

Dated at ..... this ..... day of ....., 19.....

.....
.....
.....

UNITED STATES
DEPARTMENT OF THE INTERIOR,
Washington, D. C. DEC - 8 1953

(SGD) E. L. UTZ
Assistant Commissioner of Indian Affairs.

16—13000-2 U. S. GOVERNMENT PRINTING OFFICE

Form 5-154
(October 1939)

CONTINUATION SHEET

Contract No.
I-149-Ind-8911

165

MINING LEASE ALLOTTED INDIAN LANDS
(For Minerals other than Oil and Gas)

The Lessee hereby agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, as royalty, the sums of money as follows:

Percentage Royalty Schedule

Mine Value Per Dry Ton	Royalty Percentage of Mine Value Per Dry Ton
$ 0.01 to $ 10.01	10%
$ 10.01 to $ 20.01	11%
$ 20.01 to $ 30.01	12%
$ 30.01 to $ 40.01	13%
$ 40.01 to $ 50.01	14%
$ 50.01 to $ 60.01	15%
$ 60.01 to $ 70.01	16%
$ 70.01 to $ 80.01	17%
$ 80.01 to $ 90.01	18%
$ 90.01 to $100.01	19%
$100.01 or more	20%

"MINE VALUE PER DRY TON", wherever used herein is hereby defined as the dollar value per dry ton of crude ores at the mine as paid for by the Atomic Energy Commission or other government agency before allowance for transportation and development; however, if the government at any time hereafter does not establish and pay for said ores on a fixed or scheduled dollar value per dry ton of crude ores at the mine, or said ores contain saleable minerals, some, or all, of which are disposed of to a custom treatment plant or smelter for treatment and sale, then mine value per dry ton shall be the gross value per dry ton of said crude ore as paid for by the Atomic Energy Commission or other government authorized agency mill or other buyer, less any allowances or reimbursements for the following specific items: (1) transportation of ores; (2) allowances for exploration for, or development of ores; and (3) treatment or beneficiation of ores; which specific items shall in such event be deducted from the gross sales price received from the metal content of said ores by the seller before said percentage royalty is calculated and paid. Such payments shall be made on or before the fifteenth (15th) day of the month next following receipt by Lessee of payment for said ores together with a statement of the mine value of said ores and the amount of royalty due on each lot shipped and sold.

In addition to the above royalty payments there shall be paid to the Superintendent for the use and benefit of the Lessor 10% of any bonus paid by the United States Atomic Energy Commission for the production of ore from the above lease and particularly bonuses for the initial production of uranium ore from said lease. But this provision shall not be limited to bonuses for initial production but shall apply to any and all bonuses paid for the production of ore.

Annual Rental

The Lessee agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, in advance beginning with the date of approval of the lease as annual rental, the sum of One ($1.00) Dollar per acre for the first calendar year and the sum of One ($1.00) Dollar per acre, in advance, for each and every calendar year thereafter during the continuation of this lease.

The rentals so paid shall not be a credit on the royalties accruing under this lease and shall not be refunded to the Lessee because of any subsequent surrender or cancellation of the lease.

Development

The land described herein shall not be held by the Lessee for speculative purposes but in good faith for mining mineral specified. The Lessee shall expend in the development of said lease in each year the sum of Ten ($10.00) dollars per acre. Such development shall consist of road [illegible] prospecting or drilling and mining operations, and the Lessee shall [illegible] submit to the Superintendent satisfactory reports [illegible] development expenditures, which reports shall be furnished within [illegible] after the yearly anniversary date of the lease; [illegible] failure by the Lessee in the diligent development and continued operation of the property, or the expenditures of the sum provided herein for the development of said lease in each year except when the operations are delayed by strikes, the elements or casualties not attributable to the Lessee, shall be held as want of compliance with the purposes of this lease and shall render it subject to cancellation; provided that when for the Secretary of the Interior shall consider the marketing facilities or economical conditions unsatisfactory he may authorize [illegible] for such time as he may deem advisable but such action shall not release the Lessee from the payment of the advance annual rental.

Payment for Surface Damage

The Lessee shall pay to the Superintendent for the use and benefit of the Lessor, as damages for the surface of the lands covered by this lease, Ten ($10.00) dollars per acre and each acre of land upon which the vegetation or any [illegible] upon which the top soil may be removed, turned or [illegible] mining or prospecting conducted on said lease, but not including the [illegible] of the surface for roads and the construction [illegible] operation of this lease. Provided, however, that in the event the royalty payments made under this lease shall [illegible] be for surface damages as [illegible] in this [illegible] in that event the Lessee shall be [illegible] from the [illegible] to pay such surface damages.

The Lessee shall not be permitted to surrender or terminate this lease until the damages provided for in this paragraph have been paid and in the event of the cancellation or forfeiture of this lease by the Secretary of the Interior as provided in said lease, the Lessee shall remain obligated to pay for surface damages as herein provided and the bondsmen of the Lessee shall not be released from liability until such surface damages are paid. The extent of the surface damages and the amount due therefor, shall be determined by the Secretary of the Interior.

The lessee shall employ Navajo labor in all positions for which they are qualified, including truck drivers, and shall protect the Indian grazing rights and other Indian rights to the surface of the lands.

The lessee shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and shall require an identical provision to be included in all subcontracts hereunder.

Two witnesses to signature of Lessee

[illegible] [illegible]

Lessee

[illegible]

(~~Address~~)

Two witnesses to signature of Lessor

[illegible] [illegible]

Lessor

Lessor

Lessor

Lessor

Lessor

Lessor

DEPARTMENT OF THE INTERIOR
Bureau Mines Administration
RECEIVED
MAR 1 6 1953

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

RECEIVED
SEP - 6 1955

August 29, 1955

224 New Customhouse
Denver 2, Colorado

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Report of Examination, DMEA Docket 3727, (Uranium), Santa Fe Uranium Company, McKinley County, New Mexico

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

We concur in the recommendation of the field examiners that a contract be approved for a two stage drilling program as outlined in the report.

The contract should provide for the use of casing or some other means of preventing the unconsolidated overburden from diluting the samples.

The operator should be required to provide a map of such scale as to distinctly show the boundaries of his land in Section 18, and the location of all holes with their collar elevations and depths. A copy of this map together with the drillers logs and results of sample analsis should accompany the Forms MF-104 each month.

The bids from three contractors requested in your letter of April 6, 1955 were not forwarded this office. The estimated cost of drilling at $0.80 per foot appears very reasonable. If the three bids you requested are still necessary, we will be glad to request them from the applicant.

Nathan Wechsler, Attorney, 1010 Vermont Avenue, N.W., Washington D. C. has been pushing this application. He has also represented other applicants including Utah Premier Uranium Company who have recently requested that their contract be rescinded.

Call E. T. Atherton
Have Wechsler
Have 3 copies
Have 3 bids
Have Wechsler
Have 3 copies
Have 3 bids
Have Wechsler

Reviewed by
DMEA OPERATING COMMITTEE
9-9-55
(date)

DMEA Field Team, Region III

W. M. Traver
W. M. Traver

for D R Macharen
E. N. Harshman

Enclosures

DMEA
Date Rec'd.

AUG 26 1955

BUREAU OF MINES
Denver, Colorado

RECEIVED
AUG - 1955

Region III

Building 20
Denver Federal Center
Denver 2, Colorado
August 26, 1955

TRANSMITTED
AUG 29 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shaw

Subject: DMEA 3727 (Uranium) Santa Fe tracts, Santa Fe Uranium Company, Inc., McKinley County, New Mexico

Enclosed are the original and ten copies of a "Joint Summary, Conclusions, and Recommendations", by Donald Haynes, Geologist, and Glen Walker, Mining Engineer, and the original and ten copies of an Engineering Report by Glen Walker, Mining Engineer, covering docket DMEA 3727.

The Santa Fe Uranium Company requested Government assistance in the amount of $222,321.00 to explore their property in McKinley County, New Mexico, by 39,190 feet of core drilling. A field examination was made on April 26, 1955. The examining team recommended a modified program consisting of 11,475 feet of dry rotary holes at an estimated cost of $15,179.00. This program was approved by the company representative.

It is recommended that a contract consisting of two stages of dry rotary holes be approved. The first stage would consist of 83 holes averaging 85 feet in depth making a total footage of 7,055 feet. Stage 2 would be dependent upon the results of Stage 1 and would consist of 52 holes offsetting mineralized holes encountered in Stage 1. Stage 2 would require the prior approval of the DMEA Field Team. The contract should provide for the transfer of footage and money from one stage to the other.

John F. Shaw
John F. Shaw
Supervising Mining Engineer

Enclosures

cc 10
EHinrichsen
DMEA 3727
Green

JFS/em

Reviewed by
DMEA OPERATING COMMITTEE
9-9-55
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

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SEP - 2 1955

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 3727, Santa Fe tracts

Santa Fe Uranium Company, Inc.

McKinley County, New Mexico

Uranium

Donald Haynes, Geologist
Geological Survey

Glen Walker, Mining Engineer
Bureau of Mines

August 1, 1955

Reviewed by
DMEA OPERATING COMMITTEE
9-9-55
(date)

DMEA 3727

SANTA FE TRACTS
SANTA FE URANIUM COMPANY, INC.
McKINLEY COUNTY, NEW MEXICO

Joint Summary, Conclusions, and Recommendations

By

Donald Haynes, Geologist
Geological Survey

Glen Walker, Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
9-9-55
(date)

DMEA 3727

SANTA FE TRACTS
SANTA FE URANIUM COMPANY, INC.
McKINLEY COUNTY, NEW MEXICO

JOINT SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Donald Haynes and Glen Walker

The Santa Fe Uranium Company requested Government assistance in the exploration for uranium ore on two separate 1/4 sections of Indian allotment land in McKinley County, New Mexico. They proposed 39,190 feet of core drilling in an undisclosed number of holes at a cost of $222,321.00.

A DMEA field examination was made on April 26, 1955, by T. E. Mullens and Donald Haynes of the U. S. Geological Survey and Glen Walker of the U. S. Bureau of Mines in company with Thomas Fife for the company.

It was concluded that a portion of the ground merits exploration because of its proximity to the large deposit of Haystack Development and Mining Co. (Santa Fe R.R.) and the number of favorable holes previously drilled. There was also a small production of ore from this particular 1/4 section. A program considerably modified as compared to the original was suggested by the examining team and approved by the company's representative, Mr. Fife.

It is recommended that DMEA participate in the cost of drilling 11,475 feet of dry rotary holes in the SW1/4 sec. 18, T. 13 N., R. 10 W., at an estimated expenditure of $15,179.00.

DMEA 3727

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SANTA FE TRACTS
SANTA FE URANIUM COMPANY, INC.
McKINLEY COUNTY, NEW MEXICO

Engineering Report

Glen Walker, Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
9-9-55
(date)

DMEA 3727

SANTA FE TRACTS
SANTA FE URANIUM COMPANY, INC.
McKINLEY COUNTY, NEW MEXICO

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DMEA 3727

SANTA FE TRACTS
SANTA FE URANIUM COMPANY, INC.
McKINLEY COUNTY, NEW MEXICO

ENGINEERING REPORT

By

Glen Walker

INTRODUCTION

The Santa Fe Uranium Company, Inc., a Utah corporation, made application to the DMEA for assistance in the exploration for uranium ore on two 1/4 sections of Indian allotment land in SW1/4 sec. 18, T. 13 N., R. 10 W., and N1/2N1/2 sec. 13, T. 13 N., R. 11 W., New Mexico principal meridian in McKinley County, New Mexico. The work outlined in the application included 58 Phase I and II holes and an unestimated number of Phase III holes. The holes were to be plug drilled through the overburden to the Todilto limestone, then cored through the limestone ore horizon. The total proposed footage was 39,190 feet and the project was estimated to cost $222,321.00.

An examination of the properties by a Region III DMEA examining team was made on April 26, 1955.

A modification of the applicant's proposal was agreed upon by the company's representative and the members of the examining team. The acceptable program consists of two stages of dry drilling through the Todilto formation; the first includes 83 holes in east-trending rows 200 feet apart with the holes 100 feet apart and staggered in the rows; the second phase would use 52 holes arranged around first stage mineralized

or indicative holes. All drilling is to be done in the SW1/4 sec. 18, T. 13 N., R. 10 W. The total project would entail 11,475 feet of drilling at an estimated cost of $15,215.00.

ACKNOWLEDGEMENTS

Thomas Fife, mine superintendent for the company, guided the examining team and furnished pertinent information on the subject and adjoining properties. The application has been discussed with the Exploration Division of AEC in Grand Junction, Colo.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The land mentioned in the application is in two 160-acre plots, the N1/2N1/2 sec. 13, T. 13 N., R. 11 W., and the SW1/4 sec. 18, T. 13 N., R. 10 W., New Mexico principal meridian. Sec. 18 can be reached by travelling about 9 miles, almost due north, along a newly constructed gravel road from Blue Water, New Mexico; the site of the Anaconda Copper Co. uranium mill. Blue Water is also the nearest rail point (see fig. 1). The property in sec. 13 is on the north side of Haystack Butte and is reached by a rough trail built, for the most part, along a ledge around the south and west ends of the Butte; it is about 2 miles from the ground in sec. 18 (see fig. 2).

Both quarter sections are relatively flat to gently rolling. The north one-fourth of SW1/4 sec. 18, however, is part of the abrupt south side of Haystack Butte, the top of which is 700-800 feet above the surrounding surface. Likewise the extreme east end of the subject land in sec. 13 is included in a high spur of the Butte. Although neither area has much relief, that in sec. 13 is about 200 feet higher than the SW part of sec. 18.

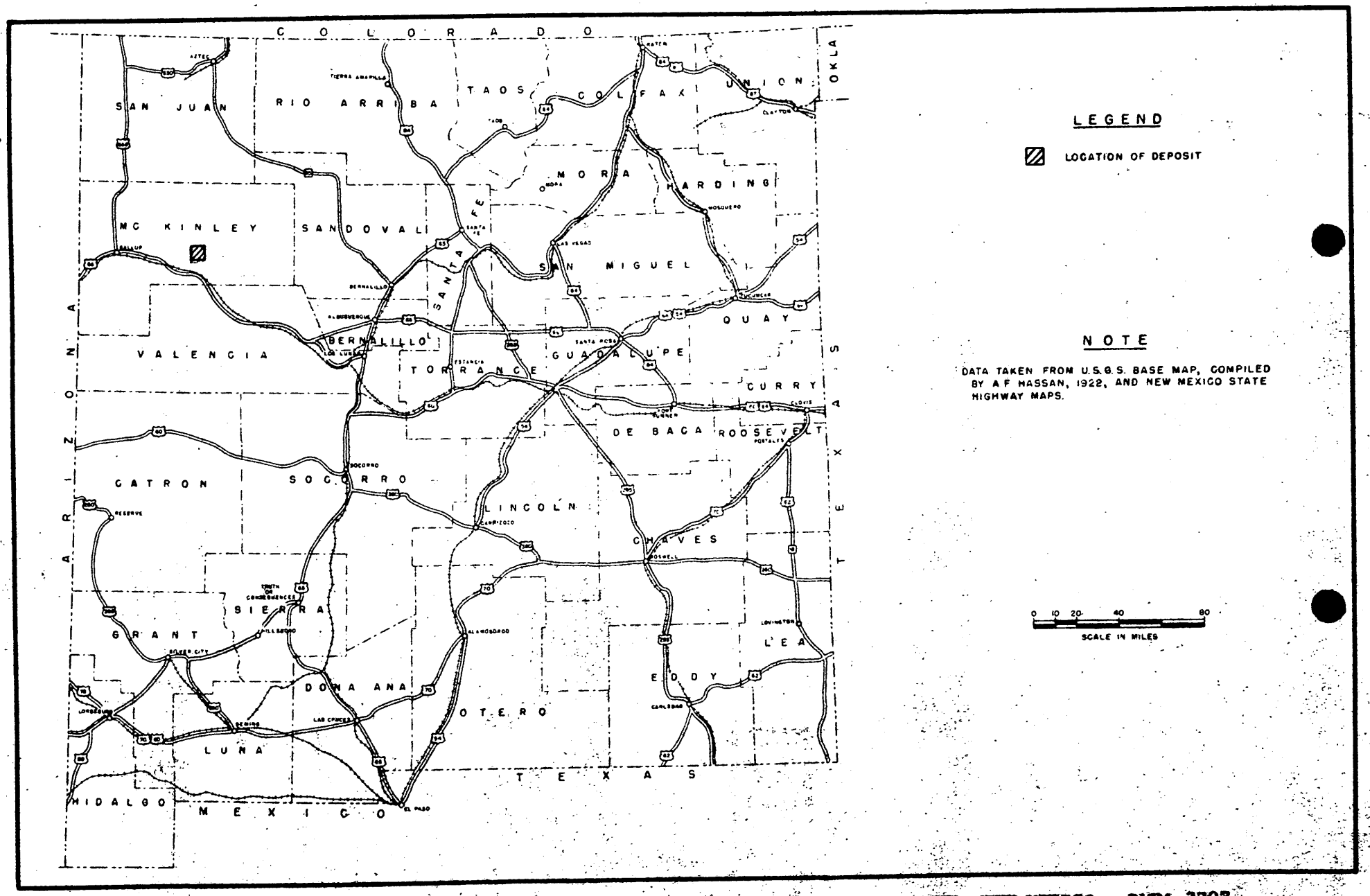

FIGURE 1 - LOCATION MAP OF SANTA FE URANIUM CO., PROPERTY IN McKINLEY COUNTY, NEW MEXICO. DMBA 3727

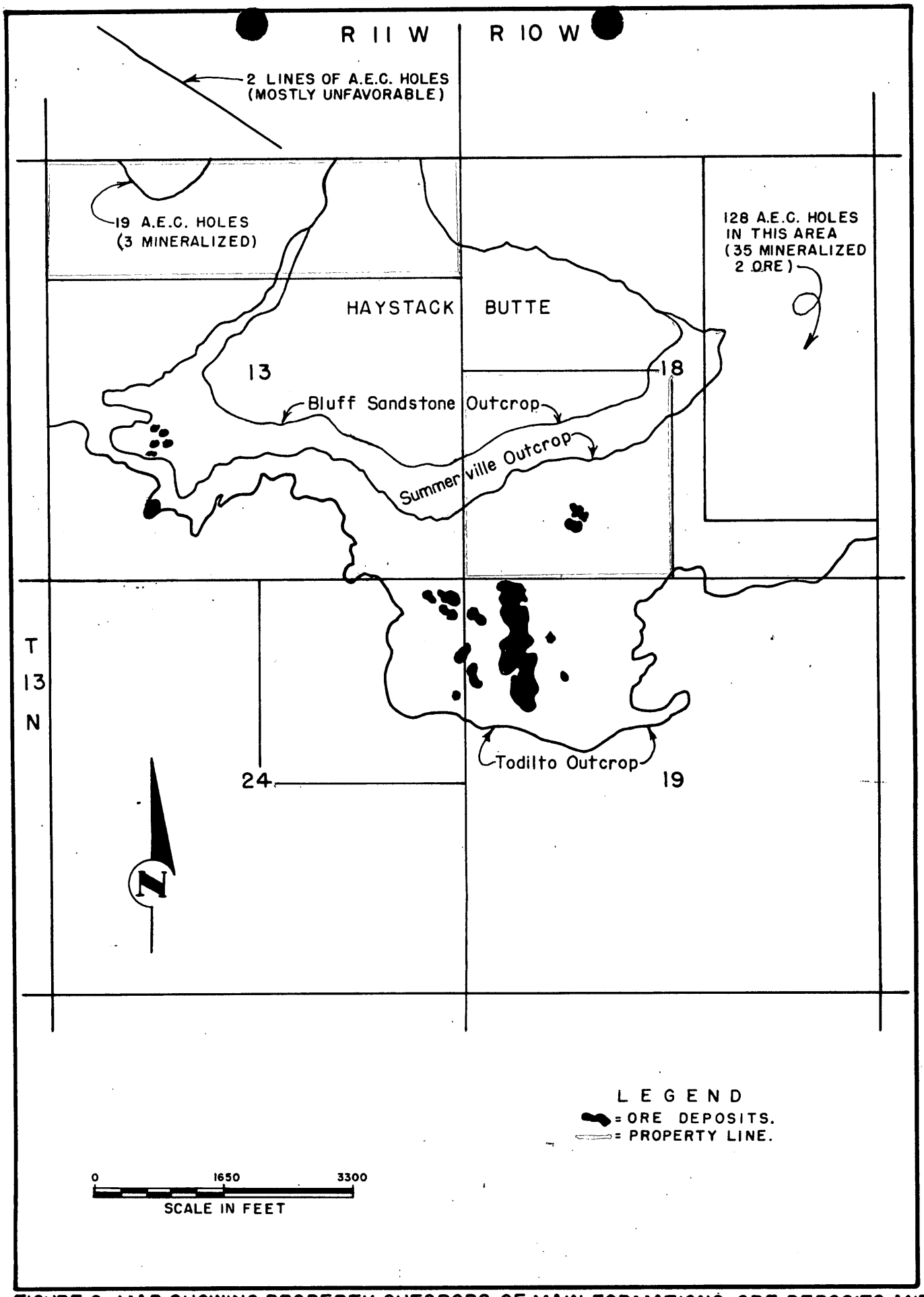

FIGURE 2-MAP SHOWING PROPERTY, OUTCROPS OF MAIN FORMATIONS, ORE DEPOSITS AND AREAS OF A.E.C. DRILLING, SANTA FE URANIUM CO., McKINLEY COUNTY, N.MEX. DMEA 3727

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The surface of both plots is covered with a space to fair growth of cedar and pinon, which would have only a limited application to a mining operation. Dimension lumber may be obtained from small saw mills on the flanks of Mt. Taylor, about 20 miles NE.

Water is at a premium in the district generally. Most of it for mining, drilling and domestic use must be hauled from agricultural wells and ponds in the vicinity.

Indians are used as common labor but experienced underground miners are rather difficult to obtain and command a high wage. Thomas Fife, the superintendent for Santa Fe Uranium Co., Inc., appears to be capable of handling any anticipated exploration or mining project on the property.

Power, for any type operation, must be supplied by internal combustion engines as public utilities are not presently available in the mining district.

HISTORY, PRODUCTION, AND OWNERSHIP

Uranium ore was first discovered in the area in 1950 on sec. 19, T. 13 N., R. 10 W., owned by the Santa Fe R.R. This deposit is estimated to have contained 128,000 tons and has produced about 30,000 tons of approximately .20 percent U_3O_8 ore. From the NE1/4 of sec. 24, T. 13 N., R. 11 W., the Santa Fe Uranium Co., Inc., has reportedly produced about 20,000 tons of ore averaging .20 percent U_3O_8. The SW1/4 of sec. 18, T. 13 N., R. 10 W., is reported to have produced 4,100 tons of .14 percent U_3O_8 ore from underground operations.

All the subject property is Indian allotment land and was originally leased by Glenn Williams and J. T. Hutton from Brown and Walter Vandever (Navajo Indians) in June 1951. Hutton assigned his equity to Williams but retained a 3 percent royalty on ore production. Williams made a sale agreement in May 1954 with Santa Fe Uranium Company, Inc., for his interest in the property.

DESCRIPTION OF DEPOSITS

All the producing deposits of the immediate area have been found in the Jurassic Todilto limestone. This formation lies above the Entrada and below the Summerville and although it is quite thin (10-35 feet) it is very persistent in lateral extent. The Todilto does not crop out on the subject ground but is known to exist from numerous drill holes and underground workings. Haystack Butte, the most prominent topographic feature in the neighborhood, has exposures of rocks from the Cretaceous Dakota to the Jurassic Summerville, and about 3/4 mile south the Entrada and Todilto crop out. The broad bench on the south side of the Butte is covered principally by unconsolidated sand. Similar conditions exist on the north side of Haystack.

All the known ore bodies in the general area appear to have a considerable range in size, shape, attitude and to a less extent grade. The largest (128,000 tons) is also the most regular and has a definite north strike; whereas many of the smaller ones appear to have more easterly trends. This inconsistency in strike may be due to prominent rock jointing in certain directions. Likewise the shape, which varies from kidney-like to very narrow and sinuous, may have been affected by certain

rock structures existing before ore deposition. The ore is in general parallel to the dip of the rock formation (2-5 degrees NE) but locally it is in sharp rolls or monoclines which have a harmful effect on the mining operation. Some open-pit mine practice includes probing of blast holes to determine as exactly as possible the top of the ore and the blasting of appreciable amounts of overlying waste material separately. The grade, here as in most uranium deposits now worked, ranges from the bare minimum saleable to considerably over 1 percent U_3O_8. Most mine operators in the area attempt to hold a shipping grade of .2 percent U_3O_8. This fact indicates the deposits are of much higher grade than .2 percent because their thinness (10 inches to 4 feet) makes dilution practically unavoidable. Very little mineralized rock was noted in the walls of abandoned pits as deposits in the Todilto limestone appear to have rather sharp lateral cut-offs.

MINABLE ORE RESERVES

Although the applicant states no reserves exist the work in progress at the underground mine in sec. 18 is directed toward the development of a roughly triangular area 190 feet by 350 feet southwest of the shaft in which seven holes indicated an average of 2.1 feet of material assaying 0.286 percent U_3O_8. It is estimated that the ore in this area has a gross value at least of $125,000.00. There is also a much smaller area northeast of the shaft that perhaps contains a few tons of slightly over 0.2 percent U_3O_8 rock. In proximity to to the shaft there appears to be approximately 5,000 tons of rock that can be extracted at a small unit profit.

PRESENT STATUS

There is no milling equipment on the property but the mining machinery includes an Allis-Chalmers HD-19 tractor with dozer blade, two Allis-Chalmers HD-5 tractors with front-end loaders, a 110-c.f.m. Schram portable air compressor (all new), three pneumatic leg feed jackhammers, one unmounted jackhammer, one 210-c.f.m. Sullivan air compressor and wagon drill mounted on a Chevrolet truck, one 315-c.f.m. Joy portable air compressor and wagon drill, one single drum hoist and miscellaneous small tools and equipment (all used).

The present company and previous lessees have done considerable mining and exploratory drilling on the SW1/4 of sec. 18; little work, other than AEC drilling, has been done on the company's land in sec. 13. On the subject land in sec. 18, a 20-degrees inclined shaft encountered a deposit of uranium about 45 feet below the surface which produced about 4,100 tons of .14 percent U_3O_8 ore. The stope or room that resulted from this production has caved but presently a drift is being driven from the bottom of the shaft in a southwesterly direction to another ore body discovered by closely spaced wagon drill holes. Another small deposit is thought by the operator to exist in the vicinity of the shaft to the northeast. His conjucture is based upon a number of reportedly mineralized holes drilled by a former lessee to satisfy stipulations of the lease.

According to data received from the applicant since the field examination 80 holes have been drilled in the SW1/4 sec. 18, 15 of which had ore showings ranging from 2 feet of 0.17 percent U_3O_8 to 2 feet of 0.40 percent U_3O_8, see figure 3.

The applicant proposed drilling 21 plug and core bit holes on 1,000-foot centers followed in the second stage by 37 holes arranged midway between the first ones. He estimated a total of 39,190 feet, 1,740 feet of which would be cored at a cost of $222,321.00, or about $5.67 per foot.

The negative results of the AEC drilling in the north part of sec. 13, T. 13 N., R. 11 W., and adjoining land eliminates this area from consideration at this time.

The applicant's representative, Thomas Fife, agreed with the examining team's program which is as follows:

Stage I, 8 rows of east-trending holes with 100 feet between holes and 200 feet between rows; the holes to be staggered in the rows. This stage would require 83 holes averaging 85 feet in depth making a total footage of 7,055 feet.

Stage II would consist of 52 holes arranged in sets of 4 and 50 feet from mineralized holes encountered in Stage I. It is estimated this stage would require a total footage of 4,420 feet. All holes are to be drilled through the Todilto formation dry and samples caught at intervals of at least 2 feet. The samples should be tested by a Geiger counter or scintillometer and those that warrant should be analyzed chemically for U_3O_8. Also the samples should be split, sacked and the sacks marked with the hole number and the depth. One split of each sample should be kept for the Government's use, the other for analyses or such use as the applicant deems necessary. The unconsolidated nature of the overburden will doubtless necessitate the use of casing or some means of preventing

caving of the holes while drilling and sampling. The first hole of Stage I should be located 150 feet east and 150 feet north of the Southwest corner of sec. 18. No hole should be drilled more than 5 feet below the bottom of the Todilto limestone formation.

The applicant would be required to make a map of such scale as to distinctly show the boundaries of his land in sec. 18, and the location of all holes with their collar elevations and depths. A copy of this map along with driller's logs and results of sample analysis should accompany the MF-104 forms each month. The proposed project should be completed in 6 months.

Stage I

<u>Independent contracts</u>		
83 dry holes totaling 7,055 feet at $.80 per foot (includes casing)		$5,644.00
<u>Labor, supervision, and technical services</u>		
1 geologist-engineer at $500.00 per month for 3-1/2 months	$1,750.00	
1 engineer's helper at $350.00 per month for 3-1/2 months	1,225.00	
Total		2,975.00
<u>Operating materials and supplies</u>		
3,000 paper sample sacks		30.00
<u>Operating equipment</u>		
None		
<u>Rehabilitation</u>		
None		
<u>New buildings and improvements</u>		
None		

Miscellaneous

Workmen's compensation, social security taxes, etc., on engineer's and helper's salaries, 5 percent of $2,975.00	$255.00	
Accounting at $50.00 per month for 3-1/2 months	148.75	
Chemical analysis, 50 at $3.00 each	150.00	
Total		$ 553.75

Total cost of Stage I $9,202.75

Cost per foot for drilling without analyses = $1.28+

Stage II

Independent contracts

52 dry holes totaling 4,420 feet at $0.80 per foot (includes casing)		$3,536.00

Labor, supervision and technical services

1 geologist-engineer at $500.00 per month for 2-1/2 months	$1,250.00	
1 engineer's helper at $350.00 per month for 2-1/2 months	875.00	
Total		$2,125.00

Operating materials and supplies

None

Operating equipment

None

Rehabilitation

None

New buildings and improvements

None

Miscellaneous

Workmen's compensation, social security taxes, etc., on engineer's and helper's salaries, 5 percent of $2,125.00	$106.25	
Accounting, at $50.00 per month for 2-1/2 months	125.00	
Chemical analysis, 40 at $3.00 each	120.00	
Total		$ 351.25

Total cost of Stage II $6,012.25

Cost per foot for drilling without analyses = $1.33

SUMMARY OF PROJECT COSTS

Phase	Footage	Duration	Estimated cost per foot	Analyses	Total cost
I	7,055	3-1/2 months	$1.28	$150.00	$ 9,180.40
II	4,420	2-1/2 months	1.33	120.00	5,998.60
Totals	11,475	6 months			$15,179.00

CONCLUSIONS

As shown on figure 2 of the geologic report there appears to be a northward trend to the Todilto ore zone which extends into the SW1/4 of sec. 18, T. 13 N., R. 10 W. This encouraging feature coupled with the fact that ore has been produced and the anticipation of more production lend support to the belief that the exploration program outlined will be successful.

RECOMMENDATIONS

It is recommended that DMEA participate in the cost of exploration as outlined.

/cm

IN REPLY REFER TO:
DMEA
Date Rec'd.
JUL 20 1955
BUREAU OF MINES
Denver, Colorado

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

July 20, 1955

TRANSMITTED
AUG 29 1955

Memorandum

To: DMEA Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3727 (Uranium), Santa Fe Uranium Company, McKinley County, New Mexico

Enclosed are 10 copies of a geologic report, and 9 extra copies of the included maps, by D. D. Haynes, U. S. Geological Survey, covering an examination of the subject property.

The examining team revised the program originally proposed by the applicant to include more intensive exploration in the geologically favorable portion of the property. The applicant's engineer has approved the revised program.

Factual data is presented in the report to substantiate the conclusion that exploration on the property is warranted and the proposed program appears satisfactory.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (19)

ENHarshman:arh

Reviewed by
DMEA OPERATING COMMITTEE
9-9-55
(date)

DMEA
Date Rec'd.
JUL 20 1955
BUREAU OF MINES
Denver, Colorado

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

July 14, 1955

TRANSMITTED
AUG 29 1955

Memorandum

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

From: J. William Hasler

Subject: DMEA 3727, Santa Fe Uranium Company, Grants District, McKinley County, New Mexico

The Santa Fe Uranium Company applied for assistance to explore for uranium in the Todilto limestone, Grants District, McKinley County, New Mexico.

The property was examined on April 26, 1955, by a Region III examing team composed of Glen Walker, U. S. Bureau of Mines; D. D. Haynes and T. E. Mullens, U. S. Geological Survey. The examining team was accompanied by Tom Fife, engineer for Santa Fe Uranium Company.

The ~~Field~~ Examining Team recommended that the original proposal be revised and it was necessary to await the arrival of additional material from the Operator and to obtain his concurrence of the revised exploration program.

The Grants uranium mining district is on the north flank of the Zuni Uplift, a broad, elongated asymmetrical dome trending in a northwest direction. The rocks exposed in the vicinity of the Santa Fe Uranium Company's property are the Jurassic Entrada sandstone, Todilto limestone, Summerville formation, Bluff sandstone, Morrison formation, and the Cretaceous Dakota sandstone. The Jurassic Todilto limestone overlies the Entrada sandstone and is the principal uranium-bearing formation on the subject property.

The ore deposits in the immediate area of the subject property range in size from 500 to tens of thousands of tons. The deposits are elongate mineralized masses, the majority of which have a trend slightly west of north, but a few have a random orientation.

Reviewed by
DMEA OPERATING COMMITTEE
9-9-55
(date)

There has been considerable production from other properties in the general area of the Santa Fe Uranium Company's property. The revised plan of exploration has been approved by the applicant and it is recommended that the plan be executed in two separate stages; the first stage is to find mineralized areas; the second stage is planned to search for and find the ore bodies within the mineralized areas, as shown on the accompanying maps. Because of the geologically favorable setting north of and adjacent to ground known to contain large deposits of uranium ore, the W$\frac{1}{2}$, SW$\frac{1}{4}$, sec. 18, T. 13 N., R. 10 W., has a good chance of containing a fairly large tonnage of uranium ore. It is, therefore, recommended that the application for DMEA assistance be approved and that the revised plan of exploration as described herein be done. I concur with the conclusions and recommendations made by the examining team.

Enclosed are 12 copies of the geologic report by D. D. Haynes, with accompanying maps and 9 extra copies. The brochure is also enclosed.

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

JWH/mlr

Enclosures

UNITED STATES DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, SECRETARY

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

DMEA 3727, Santa Fe Uranium Company
McKinley County, New Mexico

Uranium

Geologic Report

by

D. D. Haynes
U. S. Geological Survey

July 15, 1955

Reviewed by
DMEA OPERATING COMMITTEE
9-9-55
(date)

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INTRODUCTION

Application (DMEA 3727) has been made by the Santa Fe Uranium Company for Government assistance in exploring for uranium in the Todilto limestone, Grants district, McKinley County, New Mexico. The applicant proposes to explore the leased areas with a maximum of 39,190 feet of core and non-core drilling at a total cost of $222,321. The Government's share would be 75 percent or $166,740.75.

The property was visited on April 26, 1955, by a Region III examining team composed of Glen Walker of the U. S. Bureau of Mines and D. D. Haynes and T. E. Mullens of the U. S. Geological Survey. The examining team was accompanied by Thomas Fife, engineer, Santa Fe Uranium Company.

The field team recommends that the original proposal be revised to allow some exploration in the SW$\frac{1}{4}$, sec. 18, T. 13, R. 10 W.

On June 7 the writer conferred with Mr. Louis Garbrecht, U. S. Atomic Energy Commission, to evaluate the property.

The Santa Fe Uranium Company properties are in the SW$\frac{1}{4}$ sec. 18, T. 13 N., R. 10 W., and the N$\frac{1}{2}$, N$\frac{1}{2}$ sec. 13, T. 13 N., R. 11 W., N.M.P.M, McKinley County, New Mexico. The properties are accessible from Grants, New Mexico by traveling about 18 miles west on U. S. Highway 66 and thence about 8 miles northeast over graded dirt roads.

The area near the Santa Fe Uranium Company properties is readily accessible in dry weather, but is very muddy in wet weather. The graded road to the property is a fairly good truck road. The Anaconda buying station is located at Bluewater on U. S. Highway 66, a distance of about 10 miles from the subject property. The Atchinson-Topeka and Santa Fe railroad parallels Highway 66.

The local area is predominantly of low relief except for Haystack Butte, the top of which is about 700 feet above the surrounding bench.

The Santa Fe Uranium Company property in the SW $\frac{1}{4}$ sec. 18, T. 13 N., R. 10 W., is partly on the southeast quarter of Haystack Butte and partly on the surrounding flat bench. The Santa Fe Uranium Company property in the N$\frac{1}{2}$, N$\frac{1}{2}$ of sec. 13, T. 13 N., R. 11 W., is partly on the northwest quarter of Haystack Butte, but mostly on the surrounding bench.

GEOLOGY

The Grants uranium mining district is on the north flank of the Zuni Uplift, a broad, elongated, asymmetrical dome trending in a northwest direction. It is about 65 miles long and 40 miles wide. The strata underlying the Santa Fe Uranium Company property dip gently northeast.

The rocks exposed in the vicinity of the Santa Fe Uranium Company property are, in ascending order, the Jurassic Entrada sandstone, Todilto limestone, Summerville formation, Bluff sandstone, Morrison formation and Cretaceous Dakota sandstone. As only those formations below the Bluff sandstone are of concern with this report only the Entrada sandstone, Todilto limestone and Summerville formation will be discussed in detail. Information concerning the overlying formations may be obtained from Table 1.

The Jurassic Entrada sandstone is the lowest rock unit exposed in the area. It is predominantly a pale reddish brown to grayish orange pink fine- to very-fine grained, cross-bedded, cross-laminated sandstone.

The Jurassic Todilto limestone overlies the Entrada sandstone and is the principal uranium-bearing formation on the subject property. The upper part is a dark-gray, dense, thinly bedded limestone. The beds are well marked and show small folds or crinkles. The upper part has been recrystallized in the vicinity of uranium deposits. The lower part is a dark-gray, dense, thick-bedded, limestone containing lenses of calcareous silty sandstone. 1/

1/ Rappaport, Irving, Interim report on the Ore Deposits of the Grants District, New Mexico, U. S. Atomic Energy Commission, RMO 1031, November 1952.

The Jurassic Summerville formation overlies the Todilto limestone and is composed of reddish brown siltstone and white, very-fine to fine-grained sandstone. The Summerville formation commonly interfingers with the Todilto limestone and the contact is difficult to find. The Summerville formation forms wide flat benches and in this area is covered by wind-blown alluvium as much as 40 feet thick. Much of the Summerville formation has been removed by erosion in the southern part of sec. 18, but nearer Haystack Butte almost the complete thickness is present.

There are few faults in the immediate area of the Santa Fe Uranium Company property. There is one fault that trends southwest through Haystack Butte.

Table 1. Generalized stratigraphic section for the area in the vicinity of sec. 18, T. 13 N., R. 10 W., McKinley County, New Mexico

Age	Formational units	Lithology	Average thickness
Cretaceous	Dakota sandstone	SS	64
- - - - - - - - - - - - - - - -Unconformity - - - - - - - - - - - - - - - -			
	Morrison formation:		
	Brushy Basin member	MS, ST	137
	Westwater Canyon member	SS	100
Jurassic	Recapture member	SS	100
	Bluff sandstone	SS	250
	Summerville formation	SS, ST	160
	Todilto limestone	LS	20
	Entrada sandstone	SS	130-230

ORE DEPOSITS

The ore deposits in the immediate area of the Santa Fe Uranium Company property range in size from 500 to tens of thousands of tons. The deposits are elongate mineralized masses, the majority of which have a trend slightly west of north but a few have a random orientation.

The deposits range in size (dimensionally) from small mineralized masses 75 feet long and 50 feet wide to large deposits such as the one on sec. 19, owned by the Haystack Mountain Development Company, which is 1250 long and 400 feet wide. These deposits are composed of numerous ore bodies which may or may not be connected by mineralized material.

The tonnage and production of some of the deposits in the vicinity of sec. 18 is as follows: The NW$\frac{1}{4}$ sec. 19, T. 13 N., R. 10 W., Haystack Mountain Development Company owner, a total tonnage of 120,000 tons of 0.25 percent U_3O_8 with 66,558 tons of 0.21 percent U_3O_8 being shipped through April 1955; from the NE$\frac{1}{4}$ sec. 24, T. 13 N., R. 11 W., owned by Santa Fe Uranium Company, 19,346 tons of 0.24 percent U_3O_8 shipped through April 1955, with present reserves of 7000 tons of 0.45 percent U_3O_8; from the SW$\frac{1}{4}$ sec. 18, T. 13 N., R. 10 W., Glen Williams, the previous lessor of the property, shipped 4,596 tons of 0.18 percent U_3O_8 through November 1953. These figures were obtained from the U. S. Atomic Energy Commission which uses an ore grade cut-off of 0.10 percent U_3O_8 one foot or more thick.

Figure 2 shows the mineralized deposits and the present status of mining operations in the immediate area of the Santa Fe Uranium Company property.

The chief ore minerals are pitchblende, tyuyamunite and uranophane. Hematite, barite, flourite, pyrite and limonite are common accessory minerals.

PROPOSED EXPLORATION

Applicant's plan of exploration

The applicant proposes the exploration in secs. 18 and 13 to be done in three stages of drilling. He proposed that stage I be done by drilling holes on a 1,000-foot grid. Those holes in the N$\frac{1}{2}$, N$\frac{1}{2}$, sec. 13 would begin 150 feet east of the west section line and 150 feet south of the north section line. Those holes in the SW$\frac{1}{4}$ sec. 18 would begin 100 feet east of

the west section line and 100 feet north of the south section line. The applicant believes that holes drilled in stage I would help establish within fairly close limits the depths where coring of the Todilto limestone should be commenced in subsequent holes. This stage I would require 21 holes for a total of 8,925 feet of drilling. Stage II drilling includes 37 holes to be drilled on a 500-foot grid pattern offsetting stage I holes. These 37 holes would require 17,205 feet of drilling. Stage III drilling is proposed to outline favorable ground with offsets as close as 50 feet, and will total about 13,000 feet.

Revised plan of exploration

From what is now known of the distribution and habits of the Todilto deposits in the vicinity of the subject area, an alternate plan of exploration is proposed that has met with the approval of the applicant.

Under this plan the SW$\frac{1}{4}$ sec. 18 is to be explored in two stages of drilling. Stage I is to find mineralized areas. Stage II is planned to search for and define the ore bodies within the mineralized areas.

Stage I drilling is planned to be done in 8 east-trending lines of holes, the lines being 200 feet apart and the holes along the lines 100 feet apart. The holes along successive lines should be staggered to be most effective. This pattern of drilling is based on finding and outlining the minimum-sized mineralized areas. The minimum-sized mineralized area appears to be about 75 feet long and 50 feet wide. The end holes in alternating lines should be about 150 feet and 200 feet from the western boundary of sec. 18. The southernmost line should be about 150 feet from the

southern boundary of sec. 18. No hole proposed by DMEA in stage I should be closer than 50 feet to any hole previously drilled on the property. In so far as possible, the drilling should proceed from south to north in order to make use of the greatest amount of available information. Stage I will require 83 holes averaging 85 feet for a total of 7,055 feet.

Stage II drilling should be done to find and roughly outline the ore bodies within the mineralized areas. These holes should be drilled 50 feet N. 45° W., N. 45° E., S. 45° W., and S. 45° E., from any mineralized hole discovered in stage I drilling. No offset hole should be closer than 50 feet to any hole previously drilled on the applicant's property. Stage II will require about 51 holes averaging 85 feet for a total of 4,335 feet. No offset hole in stage II should be closer than 50 feet to any other hole drilled in stage I or stage II. Stages I and II will necessitate 134 holes with a maximum of 11,390 feet of drilling. No hole should be collared above the Summerville formation due to the increased drilling depth to the Todilto limestone.

Suggestions for sampling.

The general drilling practice in the Grants area is to do rotary plug-bit drilling with water. This method keeps the overburden and unconsolidated rocks from caving into the holes. That part of the hole below the plug-bit zone, say 20 feet above the estimated top of the Todilto limestone should be drilled with air.

Mr. L. S. Hilpert, district geologist for the Grants area, U. S. Geological Survey, suggests the following plan of sampling:

a) The operator is to place a geiger tube in the return air stream at the mouth of the drill hole when the base of the hole is near the ore zone, say 10 feet above the estimated top of the Todilto.

b) When the geiger instrument registers 0.02 percent eU_3O_8 or more, have the operator immediately start collecting samples for each 1 foot interval until the base of the Todilto is reached. If the last sample registers 0.02 percent eU_3O_8 or more, have samples continue to be taken until the anomaly is less than 0.02 percent eU_3O_8.

c) All samples collected should be checked radiometrically in the field. When they register 0.02 percent eU_3O_8 or more, they should be split and one-half the split be assayed in the radiometric lab. Every tenth sample assayed radiometrically should also be assayed chemically to verify the results of the radiometric analysis.

d) The other half of the splits of all samples that are assayed in the lab, radiometrically or chemically, be packaged and stored until picked up by the examining team.

e) The hole should be logged radiometrically as soon as completed so as to lessen the chance of contamination from radon gas and the results from this logging should be compared with the results of the radiometric and chemical assays.

All holes will be bottomed 5 feet into the underlying Entrada sandstone unless the samples being collected register 0.02 percent eU_3O_8 or more on the geiger instrument used to check the return air stream at which time the hole will be continued until the geiger instrument registers less than 0.02 percent eU_3O_8.

RECOMMENDATIONS AND CONCLUSIONS

Because of the geologically favorable setting north of and adjacent to ground known to contain large deposits of uranium ore, the W½ SW¼ sec. 18, T. 13 N., R. 10 W., has a good chance of containing a fairly large tonnage of uranium ore. The E½ SW¼ sec. 18 will not be explored at this time due to the greater drilling depth and to the fact it is lying north of an area considered not favorable for ore deposition. The N½, N½, sec. 13, T. 13 N., R. 11 W., is considered unfavorable, for the localization of ore deposits by the U. S. Atomic Energy Commission, which has drilled a number of holes in that area. Also the depth through the Todilto limestone is about 250 feet in sec. 13 and it would not be economical to drill at such depths for the minimum-sized ore deposits.

The plan for exploration is a modification of the one originally proposed by the applicant. The modified plan has the complete agreement of the applicant's engineer. It is, therefore, recommended that DMEA assistance be provided to explore the W½ SW¼ sec. 18 as outlined in this geologic report.

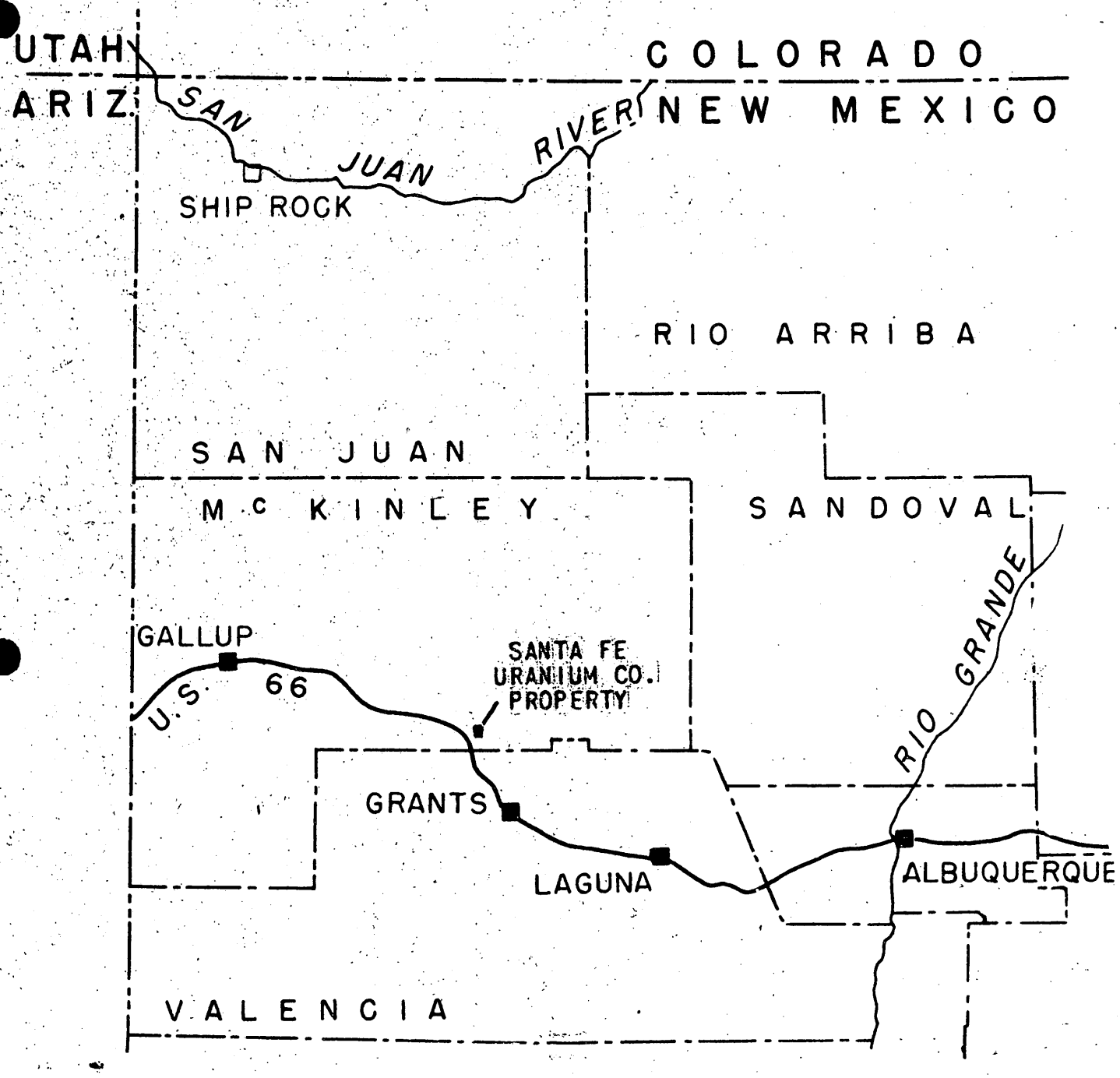

Figure 1. INDEX MAP OF NORTHWESTERN NEW MEXICO SHOWING LOCATION OF SANTA FE URANIUM CO. PROPERTY MCKINLEY COUNTY, NEW MEXICO

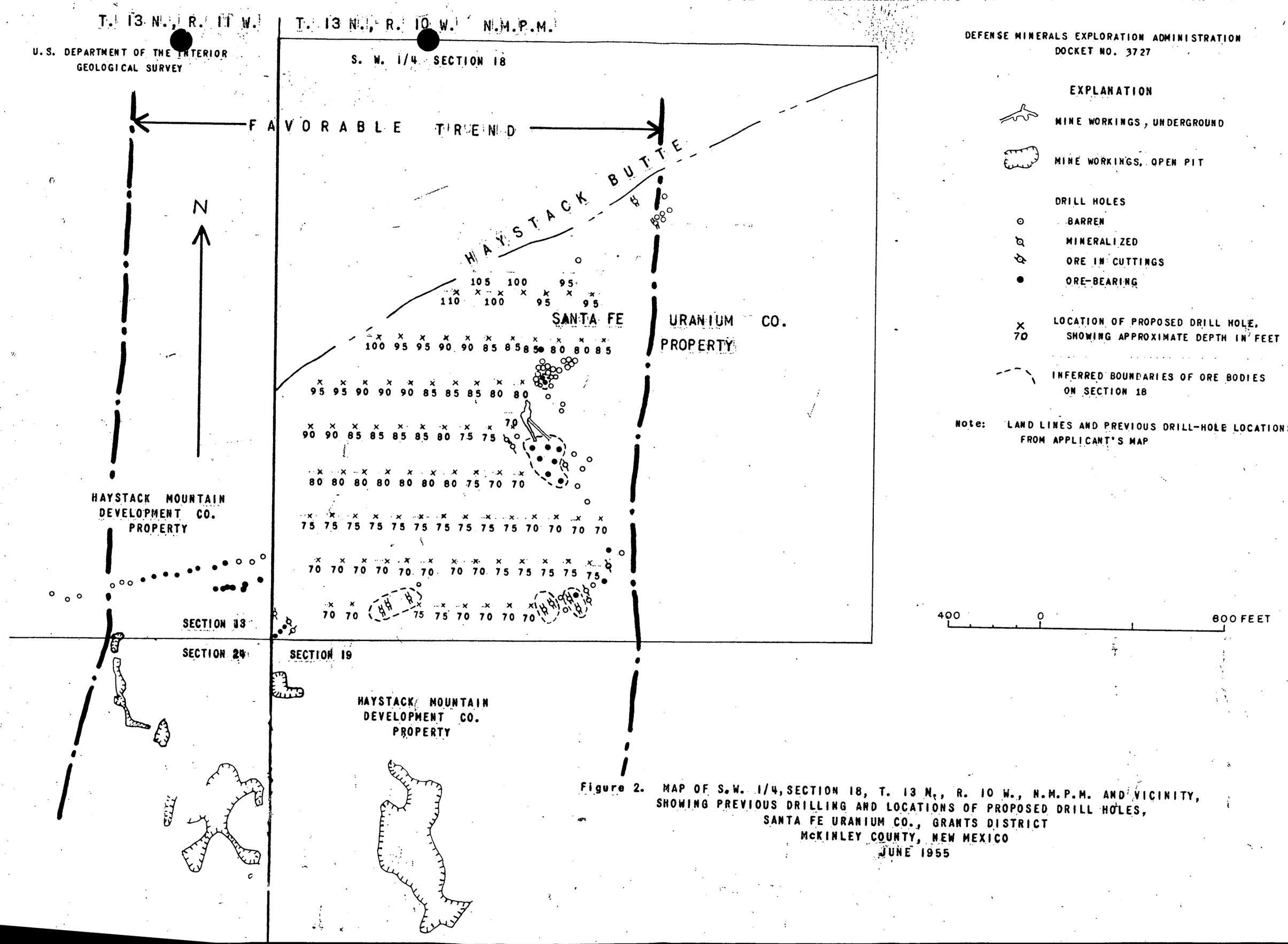

Figure 2. MAP OF S.W. 1/4, SECTION 18, T. 13 N., R. 10 W., N.M.P.M. AND VICINITY, SHOWING PREVIOUS DRILLING AND LOCATIONS OF PROPOSED DRILL HOLES, SANTA FE URANIUM CO., GRANTS DISTRICT McKINLEY COUNTY, NEW MEXICO JUNE 1955

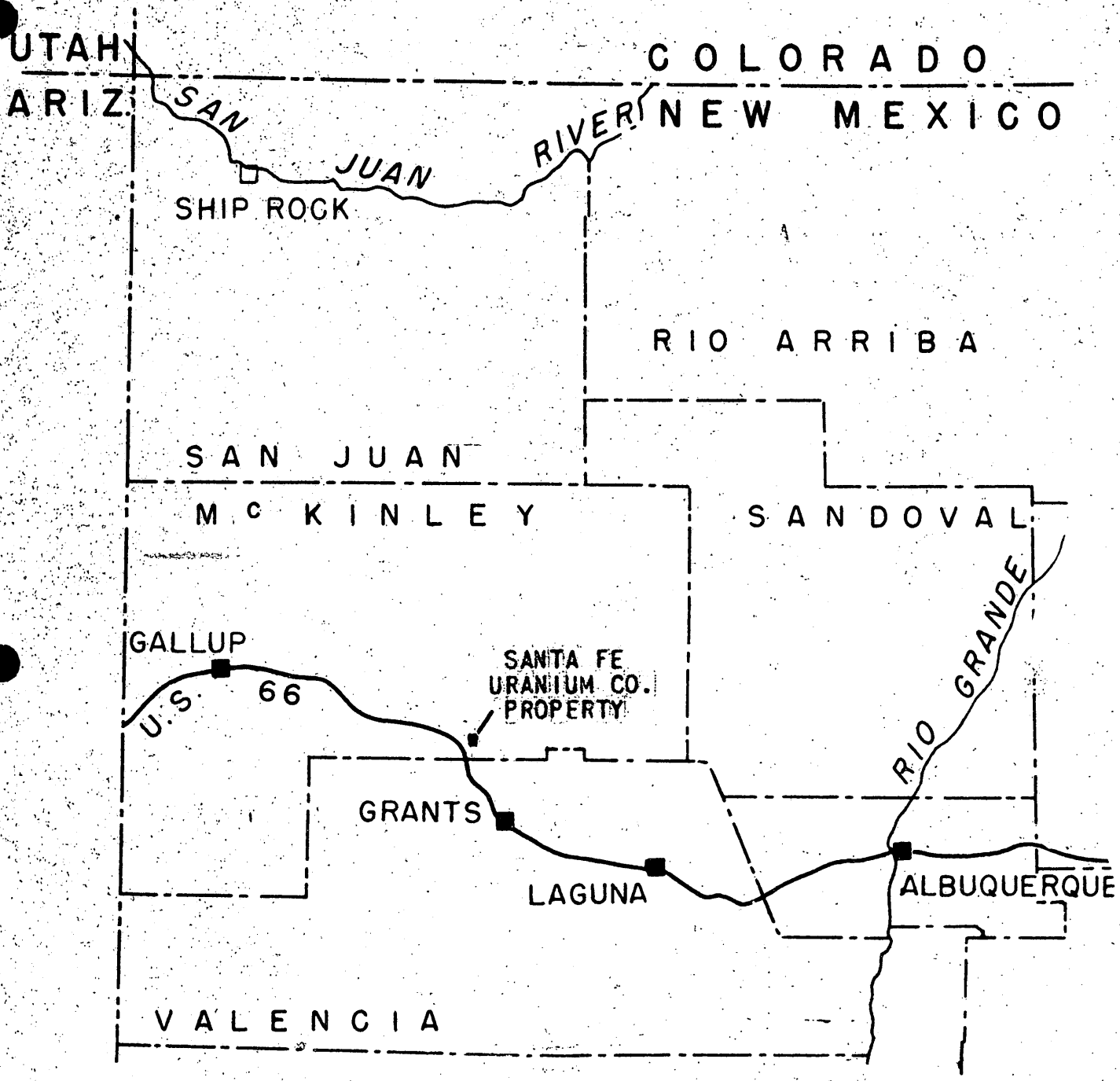

Figure 1. INDEX MAP OF NORTHWESTERN NEW MEXICO SHOWING LOCATION OF SANTA FE URANIUM CO. PROPERTY MCKINLEY COUNTY, NEW MEXICO

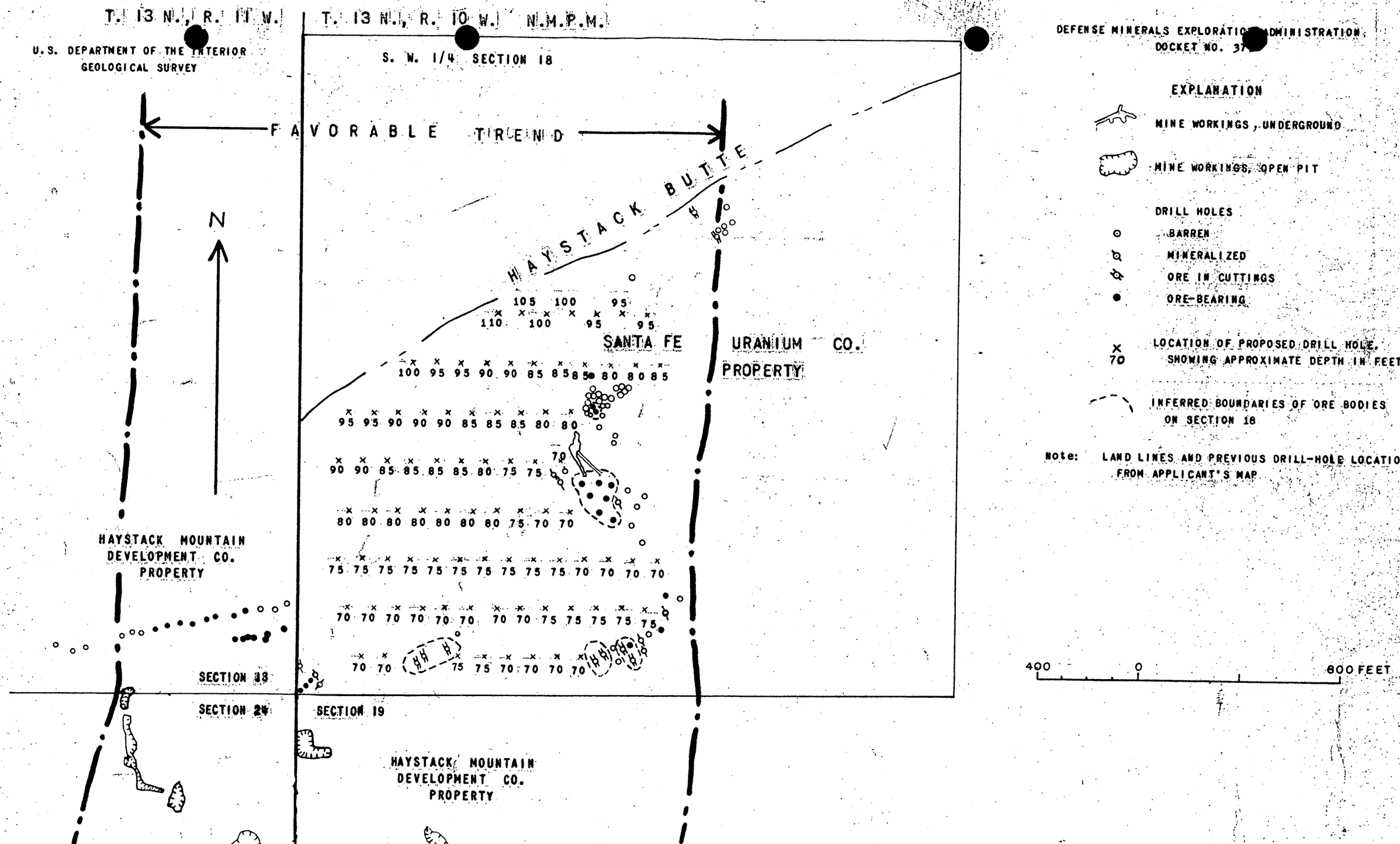

Figure 2. MAP OF S.W. 1/4, SECTION 18, T. 13 N., R. 10 W., N.M.P.M. AND VICINITY, SHOWING PREVIOUS DRILLING AND LOCATIONS OF PROPOSED DRILL HOLES, SANTA FE URANIUM CO., GRANTS DISTRICT McKINLEY COUNTY, NEW MEXICO JUNE 1955

IN REPLY REFER TO:
/DMEA
Date Rec'd,
MAY 3 1955
BUREAU OF MINES
Denver, Colorado

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

RECEIVED
MAY - 2 1955

May 3, 1955

TRANSMITTED
AUG 29 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3727, Santa Fe Uranium Company, McKinley County, New Mexico

Enclosed are 10 copies of a preliminary memorandum by T. E. Mullens, U. S. Geological Survey, covering his examination of the property.

It appears that considerable work has been done since submission of the application and that data on this work are needed before final action can be taken on the application for exploration assistance.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (10)

ENHarshman:arh

Colorado Plateau District
P. O. Box 360
Grand Junction, Colorado

RECEIVED
SEP - 1955

April 28, 1955

TRANSMITTED
MAY 20 1955

Memorandum

To: E. N. Harshman

From: W. P. Williams

Subject: DMEA 3727, Santa Fe Uranium Company

Transmitted herewith are 11 copies of a preliminary report on the subject application by T. E. Mullens.

The examining team discovered that Santa Fe Uranium, previous owners, and the AEC have done considerable work on the property where Santa Fe Uranium plans to explore with DMEA assistance. No mention of this work was made in the brochure.

Mullens believes that this work should be evaluated before he could recommend an exploration program. He, therefore, recommends that DMEA write to the applicant company and request the necessary information. The pertinent facts to be requested by DMEA are included in the preliminary report. I concur with the recommendation that DMEA request more information from the applicant company.

WPW

W. P. Williams
Geologist

Colorado Plateau District
P. O. Box 360
Grand Junction, Colorado

April 28, 1955

Memorandum

To: E. N. Marshman

From: T. E. Mullens

Subject: Preliminary report on DMEA 3727, Santa Fe Uranium Company, SW1/4 sec. 18, T. 13 N., R. 10 W., and N1/2 N1/2 sec. 13, T. 13 N., R. 11 W., McKinley County, New Mexico

The subject property was examined by a Region III examining team on April 26, 1955. The team consisted of Glen Walker, U. S. Bureau of Mines, and D. D. Haynes and T. E. Mullens, U. S. Geological Survey. The team was accompanied by Thomas Fife, Santa Fe Uranium Company engineer.

Briefly, the examining team will recommend some DMEA assistance to explore the SW1/4 sec. 18, but will not recommend DMEA assistance at this time to explore the N1/2 N1/2 sec. 13.

Santa Fe Uranium and the previous owners have done considerable work near some ore bodies in the central part of SW1/4 sec. 18. This work consists of a number of drill holes and an incline; however, none of the work was shown on the maps in the brochure with the exception of a "drill holes" notation. Without the location of the holes drilled and the incline, the examining team cannot plan an exploration program which would take advantage of previous work.

Mr. Fife told us that he had surveyed all holes on the property, but he has no map as he has not worked up his notes. Mr. Fife offered to send the Survey and the Bureau of Mines a copy of the map when he completes it. Then the examining team in connection with the company engineer could design a drilling program for the property.

As a matter of policy, I believe the map showing drill holes and incline should be included in the brochure. Thus, I recommend that DMEA write the applicant company and request 4 copies to go in the brochures. The maps should show the incline and drill holes. The drill holes should be divided into two classes: 1) drill holes which have been sampled and probed, and 2) drill holes which were not sampled or probed. The two classes are necessary as all records on some drill holes are lost and Santa Fe Uranium does not know what the holes penetrated. The map should also show the depth of the drill holes.

DMEA should also request that the company submit a drill hole map of the N1/2 N1/2 sec. 13. Nineteen AEC drill holes and several private drill holes have been drilled in this part of the section, and a map of these holes would complete the record. However, the examining team will not recommend any DMEA assistance for section 13 at this time.

T. E. Mullens

T. E. Mullens
Geologist

W. S. Martin 7/25/55 gla

RECEIVED
JUL 25 1955

BU R MINES DN35 7-25-55 9-49 PXXX AM

W S MARTIN, AING CHAIRMAN, OP. COMM., DMEA

REURTT JULY 2 DOCKET 3727, SANTA FE URANIU M, SURVEY REPORT RECEIVED, BUREAU REPORT PROMISED JULY 29. PROBABLY WILL TRANSMIT TO YOU AUG.1.

W M JAVER

7-26-55

I called Nathan Weichel's office this date & informed him of the above T.T.

Denver, Colo.

JUL 25 1 20 PM '55
BUREAU OF MINES
MAIL ROOM
WASHINGTON, D.C.

Surname 700

Ellis
Geehon
Kiilsgaard
Gehrman
Matheudoy

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

DEPARTMENT OF THE INTERIOR

JUL 22 1955

DMEA

14X4401(01)Revolving Fund,
Defense Production Act (Interior)
(Allocated Working Fund to the Office
of the Secretary)

T E L E T Y P E

W. H. TRAVER
EXECUTIVE OFFICER
DMEA FIELD TEAM, REGION III
224 NEW CUSTOMHOUSE BUILDING
DENVER 2, COLORADO

RE SANTA FE URANIUM COMPANY, INC., DOCKET 3727 PLEASE ADVISE WHEN WE MAY EXPECT FIELD TEAM REPORT.

W. S. Martin
Acting Chairman, Operating Committee (JHB)

EWEllis:am
7-22-55
cc to: Admr. Reading File
Operating Committee
Docket
Messrs. J. E. Crawford, Room 3641
T. H. Kiilsgaard, Room 5222
J. O. Hosted, Rm. 3210, GSA
Code 700
Confirmation to Region III(1)

R.C.J.

Rubin

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

APR 20 1955

Memorandum

To: The Administrator, DMEA
Attention: Mr. E. W. Ellis

Subject: Docket No. DMEA-3727 (Uranium), Santa Fe Uranium Company, Inc.

Pursuant to Mr. Knouse's memorandum of April 11, we have reviewed the subject application to determine the sufficiency of the applicant's interest in the land.

Two parcels of land are involved, one owned by Walter Vandever, and one by Brown Vandever, both Indian allottees. These lands were leased, on Indian Bureau standard forms, for periods of 15 years, and are identified as Contract No. I-149-Ind-8911 and Contract No. I-149-Ind-8913, respectively, each dated June 7, 1951. By [illegible] assignments dated June 23, 1954, approved by the [illegible] of the Interior, these leases now properly [illegible] Santa Fe Uranium Company.

[illegible] individual Indian allottee [illegible] tribal Indian land, [illegible] believe, upon investigation of the matter, that it would be most difficult to obtain a departmental approval of a consent to lien from the Indian allottee. At least it would require a long delay to determine the point. In this regard Mr. Knouse's memorandum states that the applicant would be willing to obtain a performance bond in lieu of a consent to lien and, in these circumstances, we believe it wise to accept same.

J. L. Hofflund

J. L. Hofflund
Acting Assistant Solicitor
Defense Minerals

HCRubin/emd
Copy to: DMEA Docket
Solicitor's Docket
E. W. Ellis (2)
J. L. Hofflund
H. C. Rubin
chron.

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

APR 13 1955

Memorandum

To: The Administrator, DMEA
Attention: Mr. E. W. Ellis

Subject: Docket No. DMEA-3727 (Uranium), Sante Fe Uranium Company, Inc.

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While the status of land held by an individual Indian allottee is to be distinguished from tribal Indian land, we believe, upon investigation of the matter, that it would be most difficult to obtain a departmental approval of a consent to lien from the Indian allottee. At least it would require a long delay to determine the point. In this regard Mr. Knouse's memorandum states that the applicant would be willing to obtain a performance bond in lieu of a consent to lien and, in these circumstances, we believe it wise to accept same.

J. L. Hofflund
Acting Assistant Solicitor
Defense Minerals

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

APR 13 1955.

Memorandum

To: The Administrator, DMEA
Attention: Mr. E. W. Ellis

Subject: Docket No. DMEA-3727 (Uranium), Sante Fe Uranium Company, Inc.

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While the status of land held by an individual Indian allottee is to be distinguished from tribal Indian land, we believe, upon investigation of the matter, that it would be most difficult to obtain a departmental approval of a consent to lien from the Indian allottee. At least it would require a long delay to determine the point. In this regard Mr. Knouse's memorandum states that the applicant would be willing to obtain a performance bond in lieu of a consent to lien and, in these circumstances, we believe it wise to accept same.

J. L. Hofflund

J. L. Hofflund
Acting Assistant Solicitor
Defense Minerals

Surname 700

F L Knouse
Ellis

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

April 11, 1955

Memorandum

To: Acting Assistant Solicitor, DMEA

From: F. L. Knouse, Mining Engineer
Rare and Miscellaneous Metals Division

Subject: Docket No. DMEA-3727 (Uranium)
Santa Fe Uranium Company, Inc.
Santa Fe tracts
McKinley County, New Mexico

INTERIOR DEPT.
APR 1 1 1955
SOLICITOR

The captioned application is being transferred to Region III for a field examination and recommendations on the proposed project.

Reference is made to my discussion with Mr. Rubin today regarding this application, a copy of which is attached. Kindly review the application and the legal documents attached thereto, and advise what documents we will require from the Applicant to draft a contract, i.e., Performance Bond, Owner's Consent to Lien or a Subordination Agreement.

Incidentally, I telephoned Mr. Nathan Wechsler, the Applicany's attorney in Washington and inquired whether, in the event a contract was approved, the Company would be willing to furnish a Performance Bond in lieu of an Owner's Consent to Lien to protect the Government's interest, to the extent of its participation in such contract, and he said they would.

F. L. Knouse

FLKnouse:am
Attachment
cc to: Docket
Code 700
Mr. Knouse

Surname 700

Ellis
Hedges
Kildgaard
Selfridge
Johnson

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

APR - 6 1955

Santa Fe Uranium Company, Inc.
c/o Mr. Nathan Wechsler
1010 Vermont Avenue, N. W.
Washington, D. C.

Re: Docket No. DMEA-3727 (Uranium)
Santa Fe tracts
McKinley County, New Mexico

Gentlemen:

The application for assistance in exploring the subject property in McKinley County, New Mexico, 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 if additional information is required.

Sincerely yours,

D. D. Mittendorf (for)

Administrator

FLKnouse:am
4-6-55
cc to: Admr. Reading File
Docket
Code 700
Mr. Knouse
DMEA Field Team, Region III(2)

R.C.h.

Surname 700

Ellis
Selfridge
K Johnson

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 - 6 1955

Re: Docket No. DMEA-3727 (Uranium)
Santa Fe Uranium Company, Inc.
Santa Fe tracts
McKinley County, New Mexico

Dear Mr. Traver:

The captioned application is referred to your office for a field examination and report on the proposed project. A copy of the application was transmitted to your office on March 17, 1955.

Enclosed are copies of memoranda from Mr. John E. Crawford, dated March 24, and Mr. E. L. Newcomb dated March 28, 1955, members of the Uranium Commodity Committee.

If the Field Team recommends either the program as submitted, or an alternate one approved by the Applicant, please furnish us the necessary information required to draft a contract. In this connection, your attention is directed to the cost items proposed by the Applicant for careful evaluation, i.e., drilling, supervision, sample analyses, etc., which are substantially higher than for similar work in other applications and contracts. Also, in the event independent contract drilling is proposed, the Applicant should be requested to furnish bids from three contractors.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (JHB)

Enclosures

APPROVED:

J. H. Hedges (JHB)
Member, Bureau of Mines

Thor H. Kiilsgaard (JHB)
Member, Geological Survey

FLKnouse:am
4-6-55
cc to: Admr. Reading File
Operating Committee
Docket
Messrs. J. E. Crawford, Rm. 3641
T. H. Kiilsgaard, Rm. 5224
J. O. Hosted, Rm. 3210, GSA
Code 700
Mr. Knouse

R.S.J.

4/4/55 gla

IN REPLY REFER TO:

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

Defense Minerals Administration
RECEIVED
MAR 31 1955

March 28, 1955

Re: DMEA-3727
Santa Fe Uranium Co., Inc.
(Santa Fe Tracts)
McKinley Co., N. Mex.
$222,321 - Uranium

Memorandum

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

From: E. L. Newcomb, U. S. Geological Survey

Subject: Review of proposed exploration program

The operator requests assistance to explore the SW 1/4 of Sec. 18, T. 13 N., R. 10 W. and the N.½N.½ of Sec. 13, T. 13 N., R. 11 W. His proposed project consists of three stages of drilling.

Stage I -- 1,000 foot pattern
21 holes -- 425 feet average depth
Total footage -- 8,925 feet

Stage II -- 500 foot pattern
37 holes -- 465 feet average depth
Total footage -- 17,205 feet

Stage III -- may include 50 foot offset holes
Estimated total footage -- 13,060 feet

The proposed drilling will test the Todilto formation which consists of shale, limestone and gypsum. The limestone beds are the only known mineralized rocks in the Todilto formation. Therefore, core drilling will be limited to the thickness of this horizon and will average about 20 feet per hole. Most of the drilling will be plug bit drilling to the favorable Todilto limestone.

The proposed exploration is located near the discovery area of the Grants district (NE 1/4, Sec. 19, T. 13 N., R. 10 W.) and is favorably located to the A.C.M. Co. mill at Grants.

The Santa Fe Uranium Co., Inc. controls the property included in the NE 1/4 of Sec. 24, T. 13 N., R. 11 W. However, this area is not a part of the proposed exploration program, because uranium ore is currently being produced from the property.

The operator states that as of May 1, 1954, Company controlled properties in the area have produced $347,746 worth of uranium ore containing 0.23 percent U_3O_8. Estimated reserves on the Santa Fe properties are about 23,500 tons averaging 0.23 percent U_3O_8 in a mineable zone about 2 feet thick.

Much of the exploration area is concealed by overburden which varies in thickness in different parts of the Company properties. As the zone of mineralization is comparatively thin, it is likely that extensive amounts of comparatively deep drilling may not be warranted. Further exploration appears to be justified, but the project should be planned so that maximum information is obtained at shallow depths before the deeper phases of the program are undertaken.

I recommend this application be referred to the Field Team for their recommendations and an examination report.

E. L. Newcomb

E. L. Newcomb

IN REPLY REFER TO:

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

March 28, 1955

Re: DMEA-3727
Santa Fe Uranium Co., Inc.
(Santa Fe Grants)
McKinley Co., N. Mex.
$222,321 - Uranium

Memorandum

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

From: E. L. Bennett, U. S. Geological Survey

Subject: Review of proposed exploration program

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The proposed drilling will test the Todilto formation which consists of shale, limestone and gypsum. The limestone beds are the only known mineralized rocks in the Todilto formation. Therefore, core drilling will be limited to the thickness of this horizon and will average about 20 feet per hole. Most of the drilling will be plug bit drilling to the favorable Todilto limestone.

The proposed exploration is located near the discovery area of the Grants district (NE 1/4, Sec. 19, T. 13 N., R. 10 W.) and is favorably located to the A.C.M. Co. mill at Grants.

The Santa Fe Uranium Co., Inc. controls the property included in the NE 1/4 of Sec. 24, T. 13 N., R. 11 W. However, this area is not a part of the proposed exploration program, because uranium ore is currently being produced from the property.

The operator states that as of May 1, 1954, Company controlled properties in the area have produced $347,746 worth of uranium ore containing 0.23 percent U_3O_8. Estimated reserves on the Santa Fe properties are about 23,500 tons averaging 0.23 percent U_3O_8 in a minemble zone about 2 feet thick.

Much of the exploration area is concealed by overburden which varies in thickness in different parts of the Company properties. As the zone of mineralization is comparatively thin, it is likely that extensive amounts of comparatively deep drilling may not be warranted. Further exploration appears to be justified, but the project should be planned so that maximum information is obtained at shallow depths before the deeper phases of the program are undertaken.

I recommend this application be referred to the Field Team for their recommendations and an examination report.

E. L. Newcomb

ELNewcomb:hlm
G-3/28/55

Copy to: Director's reading, 4212
Branch reading, 4212
DMRA (3)
Docket file
J. E. Crawford, 3641 Interior

3/25/55 fa

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

March 24, 1955

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4445

From: Bureau of Mines Member
Uranium Commodity Committee

Subject: DMEA Docket 3727, Santa Fe Uranium Company,
620 Judge Building, Salt Lake City, Utah

I have reviewed the attached application of the Santa Fe Uranium Company, DMEA Docket 3727. Joseph O. Hosted, Washington representative of the Atomic Energy Commission, also reviewed the application, and we have discussed it together.

The data supplied in the application of the Santa Fe Uranium Company indicates that significant ore reserves on the property already have been proven by an extensive exploration program. If such is the case, the proposed drilling plan presented by the organization would represent development work.

Based on the information contained in the attached application we suggest that assistance be denied.

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)

March 17, 1955
Subject: DMEA 3727
Re: Exploration Assistance

Santa Fe Uranium Company, Inc.
C/o Mr. Nathan Wechsler
1010 Vermont Avenue Nw.
Washington, D. C.

Gentlemen:

The receipt of your application dated March 12, 1955 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA 3727 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

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
MAR 16 1955

Not to be filled in by applicant

Docket No. 3727
Metal or Mineral Uranium-Vanadium
Date Received 3-16-55
Estimated Cost $222,321
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: Santa Fe Uranium Company, Inc.
620 Judge Building
Salt Lake City, Utah

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

(*c*) If a corporation, add to above statement, titles, names and addresses of officers. See Report, Page 1

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

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

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract See Report - Page 2

(*b*) State any mine name by which the property is known. See Report - Page 2

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

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

(*e*) If you own the land, describe any liens or encumbrances on it See Report - Page 2

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

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. See Report - Page 3

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. See Report - Page 3, 4 & 5

(*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 Report - Page 3, 4 & 5

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. See Report - Page 8

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power. See Report - Page 8

16—66551-1

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

(*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 Report - Page 8

(*c*) The work will start within 6 weeks days and be completed within 8 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See Report Page 11

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 Report - Page 13

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

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel. See Report - Page 13

(*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 Report - Page 13

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

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project. See Report-Page 13

(*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 Report - Page 13

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

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

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)? - See Report - Page 14

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

☒ Money ☐ Use of equipment owned by you ☐ Other

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated March 12, 1955

Santa Fe Uranium Company, Inc.
(Applicant)

By Meechan Tolchaber
Power of attorney

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

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

APPLICATION TO DMEA

SANTA FE URANIUM COMPANY

Address all communications to:

Mr. Nathan Wechsler
1010 Vermont Avenue, NW
Washington, D. C.

Prepared by:

WECHSLER AND COMPANY
1010 Vermont Avenue, N.W.
Washington, D. C.

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, That SANTA FE URANIUM COMPANY, a Utah Corporation, does hereby make, constitute and appoint, NATHAN WECHSLER, his agents and attorneys, its true and lawful attorney to appear for it and represent it before the United States Department of Interior, Defense Minerals Exploration Administration, in connection with any matters involving application for aid in an exploration project in which it is a party, giving its said attorney full power to do everything whatsoever requisite and necessary to be done in these matters, and to execute all agreements in these matters, as fully as the undersigned might do if done in its own capacity, with full power of substitution and revocation at any time subsequent to the date hereof and prior to the revocation hereof.

It is requested that all communications addressed to the undersigned, regarding any matter in which the said attorney is hereby authorized to act, be addressed to:

Mr. Nathan Wechsler
1010 Vermont Avenue, N.W.
Washington, D. C.

All powers of attorney for this purpose heretofore filed or executed by us are hereby revoked.

IN WITNESS WHEREOF, the said SANTA FE URANIUM COMPANY, has executed this power of attorney in duplicate by causing its name to be hereunto signed by H. R. Brownson, its President, with its corporate seal affixed and attested by A. D. Morgan, its Secretary, this 3rd day of February, 1955. A. D.

SANTA FE URANIUM COMPANY

BY: H. R. Brownson
President

ATTEST:

A. D. Morgan
Secretary

STATE OF UTAH

COUNTY OF SALT LAKE

On the 3rd day of February A. D., 1955, personally appeared before me H. R. Brownson and A. D. Morgan who, being by me duly sworn, did say that they are the President and Secretary, respectively, of the above corporation, whose names are signed to the foregoing power of attorney, and who have acknowledged the same before me in the city and county aforesaid.

Witness my hand and notarial seal this 3rd day of February, 1955.

My Commission Expires:

R. D. Ruckenbrod
Notary Public

7-24-58

SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

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SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

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SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

REPORT ACCOMPANYING APPLICATION TO DMEA

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 16 1955

1. NAME OF APPLICANT

(a) The applicant is the Santa Fe Uranium Company, 620 Judge Building, Salt Lake City, Utah.

(b) The Santa Fe Uranium Company is a corporation organized under the laws of the State of Utah, and authorized to do business in New Mexico.

(c) The following are the titles, names and addresses of officers:

(1) President and Director:

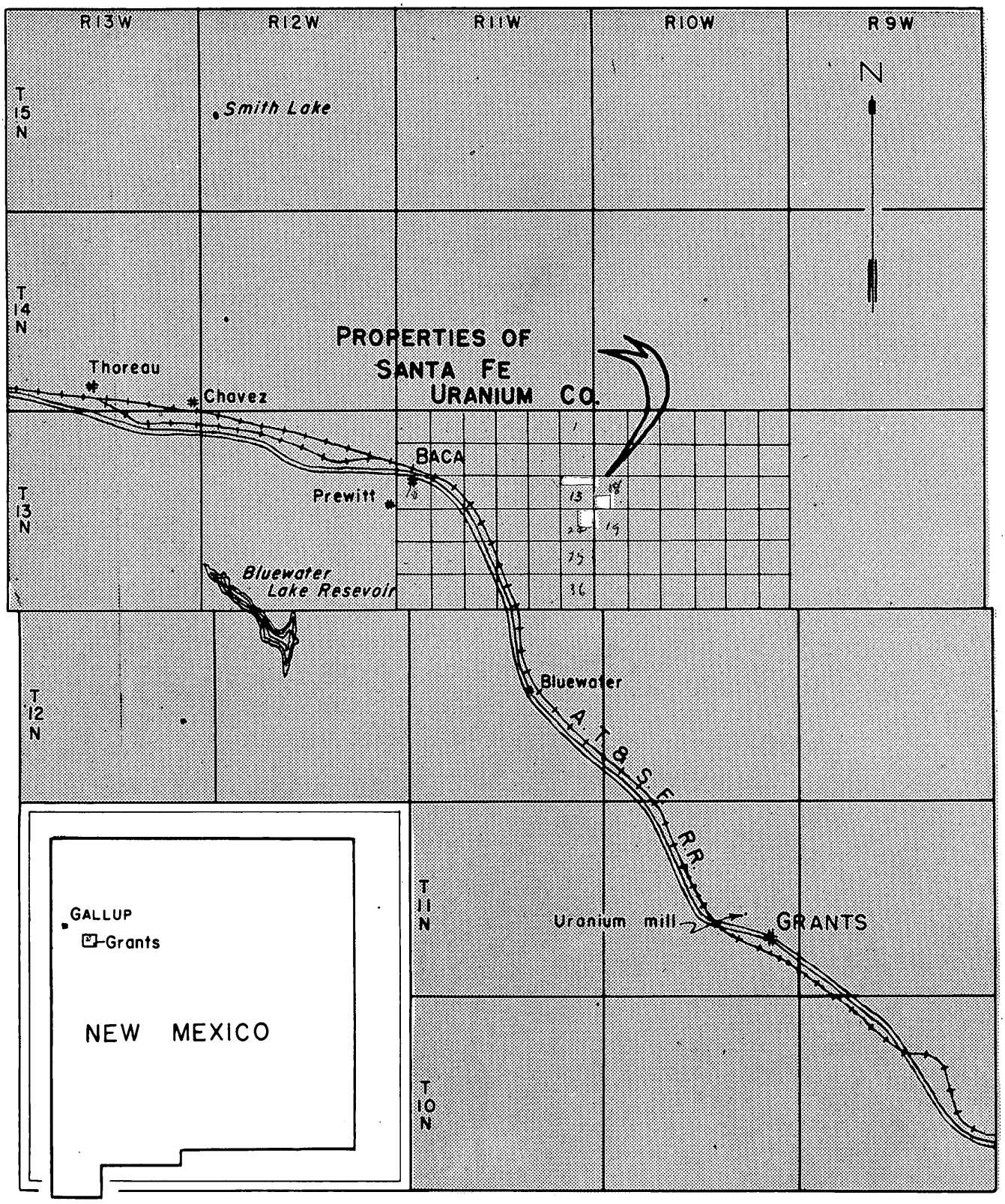
H. R. Brownson
Wenatchee, Washington

(2) Vice-President and Director:

Hyrum Schnieder
4 1 Florence Drive
Lafayette, California

(3) Secretary and Treasurer:

A. D. Morgan
579 12th Avenue
Salt Lake City, Utah



INDEX MAP SHOWING LOCATION
OF THE
SANTA FE URANIUM COMPANY NEW MEXICO

SCALE

1 3/4 1/2 1/4 0 mile

GEOPROFESSIONAL
SERVICES INC.

any way casts doubt on the possibility of ore under cover back of the present known deposits. In other words all evidence favors the interpretation that the ore bodies are probably just as numerous under cover as they are at the eroded and stripped edge of the formation where they are being mined at present. This idea is vital to an evaluation of the district as a whole and in this instance particularly to the Santa Fe Uranium Company properties.

The area in the immediate vicinity of the Santa Fe Uranium Company properties is known as one of the largest producers of Todilto type ore in the Grants district. This is one of the most favorable factors regarding the properties. As shown by the appended map, the two southern tracts of the Santa Fe Uranium Company property directly adjoin and partially surround the very large and productive mines of the Santa Fe Railroad Company. While some of the ground within Sec. 24 lies below the Todilto formation and has little value, some of it covers exposed Todilto and also thinly covered favorable ground. In fact this area has, as of April 30, 1954, already produced ore having a value of $301,-932.81 and has not been fully explored. The tract in Sec. 18 covers a small amount of actual outcrop of Todilto, but about half of the area appears to have cover which can be economically removed if ore is being followed or has been located by drilling. The northern tract, in Sec. 13 has deeper cover but the productive formation is still within the range of economic development.

PRODUCTION DATA
(To May 1, 1954)

SW¼, Sec. 18, T. 13 N., R. 10 W.–Approx. 1600 tons. Average U3O8 content /0.23–value $45,-813.18.

NE¼, Sec. 24, T. 13 N., R. 11 W.–Approx. 12,000 tons. Average U3O8 content /0.23–value $301,-932.81.

The foregoing includes bonuses and haulage allowances.

ORE RESERVES

On April 30, stripping operations had exposed a bend of Todilto limestone. Since that date the chief activity has consisted of drilling to determine the trend of known ore bodies and to establish new reserves. On July 1, 1954, 80 drill holes had been completed and these were examined and tested with the Geiger probe to determine the tenure and tonnage of newly found ore. The said drill holes are spaced from 15 to 23 feet apart and have tested an area comprising 65,450 square feet. Of the said 80 drill holes, 8 had collapsed and no data were obtainable. The remaining holes were all in mineralized formation. Thickness of the ore bearing bed ranges from 10 to 20 inches.

On the basis of our inspection of the property and from the prior operations thereon and the aforesaid drilling data, we believe that the potential reserves of marketable ore are large.

It should be noted that said Geiger counter readings and estimates may or may not be accurate. They do not constitute the most accurate method of determining ore reserves.

SUMMARY

The Santa Fe Uranium Company properties are considered favorable for the production of uranium ore on a profitable basis for the following reasons:

1. They are located on the productive Todilto limestone and cover structures (folds) and types of rock that are favorable to ore formations by all known criteria.

2. They are in geographically favorable territory. The SW¼, Sec. 18 and NW¼, Sec. 24 are immediately adjacent to the large and highly productive tracts owned by the Santa Fe Railroad Company. Production from these adjacent tracts has averaged over 200 tons of ore per [illegible] for more than one year.

3. To date, mining has been from easily discovered surface exposures and has chiefly "followed the ore." Much untested ground remains to be explored.

4. Drill holes have encountered ore in the SW¼, SW¼, Sec. 18.

5. The uniform tenure of the ore, demonstrated ore reserves, close proximity to milling facilities, and ease of mining are features which contribute to the economic attractiveness of the Santa Fe Uranium Company properties.

Submitted by,
GEOPROFESSIONAL SERVICES, INC.,

/s/ A. J. Eardley
A. J. Eardley

/s/ F. W. C. by N. C. W. A.J.E.
F. W. Christiansen

/s/ Norman C. Williams
Norman C. Williams

SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 16 1955

3. PROPERTY RIGHTS

The company holds mineral leases on the following described properties located in McKinley County, East Navajo, New Mexico, the same being allotted Indian Lands on which the DMEA loan application is being applied for.

2-20-55
Note: Disregard this "line out." It is correct as stated, per Nathan Wechsler the above date. EWR.

(1) ~~Lots 3 and 4 and the E 1/2 of~~ SW 1/4 of Section 18, Township 13 North, Range 10 West, N.M.P.M.

(2) The N 1/2 of N 1/2 of Section 13, Township 13 North, Range 11 West, N.M.P.M.

The said leases are subject to overriding royalties of 3% in favor of J.T. Hutton and Parallee Hutton, Farmington, New Mexico, and a sliding royalty of 10% to 20% depending upon grade of ore in favor of the Indian lessors, as follows:

Mine Value per Dry Ton	Royalty Percentage
$ .01 to $ 10.00 inclusive	10%
10.01 to 20.00 "	11%
20.01 to 30.00 "	12%
30.01 to 40.00 "	13%
40.01 to 50.00 "	14%
50.01 to 60.00 "	15%
60.01 to 70.00 "	16%
70.01 to 80.00 "	17%
80.01 to 90.00 "	18%
90.01 to 100.00 "	19%
100.01 to more	20%

The location of the said properties are more fully set forth in the geological report and accompanying maps included in this report. Matters of title are also set forth herein. The foregoing constitute all of the properties presently held by the company except the NE 1/4 of Section 24, Township 13, North, Range 11 West, upon which no loan application is being made and upon which there is current production.

SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

4. PHYSICAL DESCRIPTION

(a) History

The Santa Fe Uranium Company uranium properties comprise three tracts of 160 acres each. The properties are centrally located in the Grants uranium district which extends for approximately 65 miles along the southern flank of the San Juan basin between Thoreau and Correo, New Mexico. Uranium was discovered in the Grants area in 1950, in the NE 1/4, Sec. 19, T. 13 N., R. 10W., adjacent to two of the Santa Fe Uranium Company quarter-sections. Compared to other uranium districts of the Colorado Plateau, the Grants district is of relatively recent discovery and is in an early stage of development. The Grants district has not yet entered the stage of feverish land play which exists, for example, in southeastern Utah. Nevertheless, the district is well established and portends to become of major importance. Numerous new mines are being developed and the Anaconda Copper Mining Company is expanding mill facilities at Grants, New Mexico, to accommodate the increase of production of ore.

The area in the immediate vicinity of the Santa Fe Uranium Company properties is known as one of the largest producers of Todilto type ore in the Grants distric t. This is one of the most favorable factors regarding the properties. As shown by the appended map, the two southern tracts of the Santa Fe Uranium Company property directly adjoin and partially surround the very large and productive mines of the Santa Fe Railroad Company. While some of the ground within Sec. 24 lies below the Todilto formation and has little value, some of it covers exposed Todilto and also thinly covered favorable ground. In fact this area has, as of April 30, 1954, already produced ore having a value of

$301,932.81 and has not been fully explored. The tract in Sec. 18 of the area appears to have cover which can be economically removed if ore is being followed or has been located by drilling. The northern tract, in Sec. 13 has deeper cover but the productive formation is still within the range of economic development.

(b) Past Production (to May 1, 1954)

SW¼, Sec. 18, T. 13 N., R. 10W - Average U308 content +0.23 -- Value $45,813.18

NE¼, Sec. 24, T. 13 N., R. 11 W. - Average U308 content +0.23 -- Value $301,932.81

Ore Reserves:

On April 30, stripping operations had exposed a bench of ore-grade Todilto limestone which was measured and calculated to contain 17,000 to 20,000 tons of ore. Since this date, the chief activity has consisted of drilling to determine the trends of known ore bodies and to establish new reserves. On June 5, 1954, 45 drill holes had been completed and these were examined and tested with the Geiger probe to determine the tenure and tonnage of newly found ore. The 45 drill holes are spaced from 15 to 23 feet apart and have tested an area comprising 36,800 square feet. Of the 45 drill holes, 8 had collapsed and no data were obtainable. The remaining 37 holes were all in mineralized formation and indicated ore ranging from .20% U308 to 1.80% U308. Thickness of the ore bearing bed ranges from 10 to 20 inches. The 36,800 square foot areas averages 1 foot of .40% U308 ore which reduced to an optimum grade of .21% U308 would permit of approximately a two foot mineable zone containing about 6,500 tons. This 6,500 tons represents a reserve of mineable ore which is in addition to the 17,000

to 20,000 tons of exposed ore.

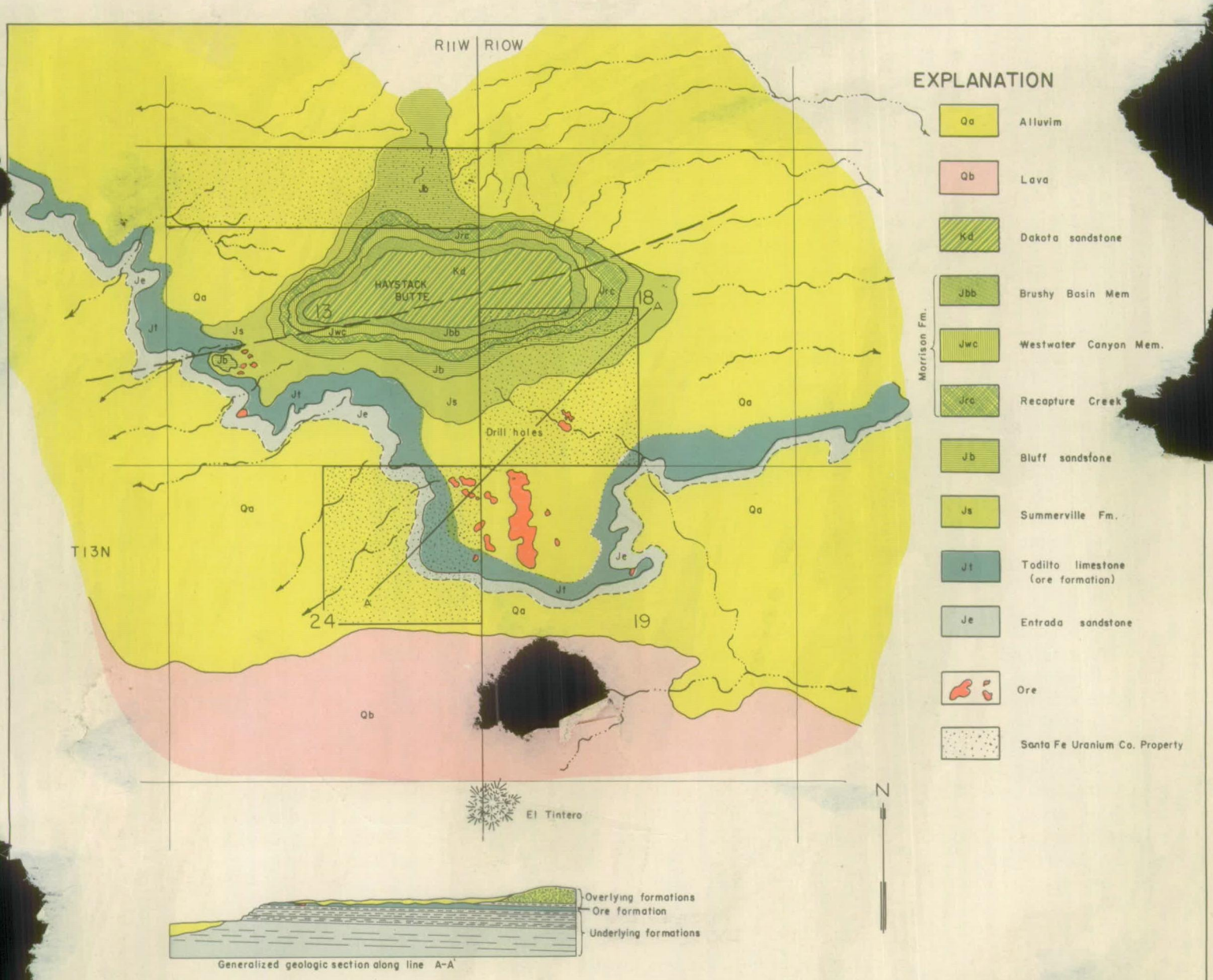
To date, the ore on the Santa Fe Uranium Company properties and on large adjacent ore bodies has demonstrated a remarkably uniform grade. The average U308 content ranges from 0.20 to 0.26. Higher and lower content is present, but for overall economy, the operators seek to maintain an average shipping grade of 0.21 to 0.24% U308.

(c) Geologic Setting

Rocks exposed in the Grants Uranium District include Triassic, Jurassic and Cretaceous formations which are mainly of continental origin. Ore has been found in the Todilto limestone, the Morrison and Dakota sandstone. Production from each of these formations has been significant and promises to increase.

The district lies mainly on the northeast flank of the Zuni uplift and the beds dip gently northward into the San Juan Basin. The hard and soft formations outcrop as cliffs and slopes, the harder beds, including the Todilto limestone, forming wide dip slopes. The Todilto outcrops are near the valley level and transportation and road building to the chief ore deposits have been relatively easy.

The ore consists of a variety of minerals but the outstanding characteristic is the high content of limestone that must be mined and treated to extract the uranium. This type of ore is much different from the sandstone type lone mined from the Morrison formation. The new Anaconda mill which is designed specifically for limestone ores will greatly stimulate mining.



GEOLOGIC MAP of SANTA FE URANIUM CO. AND ADJOING PROPERTIES, N.M.

SCALE

1000 0 1/4 1/2 3/4 1 mile

GEOPROFESSIONAL SERVICES INC.
1311 WALKER BANK BUILDING, SALT LAKE CITY, 1, UTAH

REPORT ON THE SANTA FE URANIUM COMPANY PROPERTIES, GRANTS, NEW MEXICO

INTRODUCTION

The Santa Fe Uranium Company uranium properties comprise three tracts of 160 acres each. The properties are centrally located in the Grants uranium district which extends for approximately 65 miles along the northern flank of the San Juan basin between Thoreau and Correo, New Mexico. Specifically, the properties are the SW¼, Sec. 18, T. 13 N., R. 10 W.; NW¼, Sec. 24, T. 13 N., R. 11 W.; N½, N½, Sec. 13, T. 13 N., R. 11 W.

Uranium was discovered in the Grants area in 1950, in the NE¼, Sec. 19, T. 13 N., R. 10 W., adjacent to two of the Santa Fe Uranium Company quarter-sections. Compared to other uranium districts of the Colorado Plateau, the Grants district is of relatively recent discovery and is in an early stage of development. The Grants district has not yet entered the stage of feverish land play which exists, for example, in southeastern Utah. Nevertheless, the district is well established and portends to become of major importance. N[illegible] new mines are being developed and the Anaconda Copper Mining Company is expanding mill facilities at Grants, New Mexico, to accommodate the increase of production of ore.

General Geology

Rocks exposed in the Grants uranium district include Triassic, Jurassic and Cretaceous formations which are mainly of continental origin. Ore has been found in the Todilto limestone, the Morrison and Dakota sandstones. Production from each of these formations has been significant and promises to increase.

The district lies mainly on the northeast flank of the Zuni uplift and the beds dip gently northward into the San Juan Basin. The hard and soft formations outcrop as cliffs and slopes, the harder beds, including the Todilto limestone, forming wide dip slopes. The Todilto outcrops are near the valley level and transportation and road building to the chief ore deposits have been relatively easy.

The ore consists of a variety of minerals but the outstanding characteristic is the high content of limestone that must be mined and treated to extract the uranium. This type of ore is much different from the sandstone type long mined from the Morrison formation. The new Anaconda mill which is designed specifically for limestone ores will greatly stimulate mining.

Relation of Uranium to the Todilto Limestone

The Todilto formation consists of shale, limestone and gypsum and is thought to have been deposited in a shallow arm of the sea. Uranium is known only in the limestone beds which were apparently laid down in an intermediate position between the shore where shale was deposited and the deeper central part of the basin where gypsum was formed. The limestone occurs in thin beds and is seldom over 15 feet in [illegible] In many places the formation exhibits numerous small-scale folds or crenulations and is also cut by fractures and joints. Much study has been made of possible effects of the folding and jointing on the formation of ore. Ore does seem to be localized chiefly in the folds but relatively few of the folds are mineralized. Mapping of one of the chief min-[illegible] has showed that five out of seven ore bodies [illegible] in primary folds despite the fact that these [illegible] less than 10 percent of the linear extent of [illegible] universally accepted ideas have been [illegible] explain the time of origin of the ore [illegible] progress has been made on guides which predict the presence of ore bodies hidden from view. In a few instances analysis of vegetation rooted in ore has helped in outlining mineralized ground but the use of the method is limited. Drilling remains the best method for proving ore and calculating reserves and so far drilling has been relatively easy since the overburden is shallow and easily penetrated.

Analysis of the Santa Fe Uranium Company Property

[illegible]estions must be answered as fully as possible [illegible] on the value and potential of any property [illegible]ered for purchase or lease: (1) Is it in a favorable [illegible]on? (2) Is it in a mineralized district, area o[illegible] (3) Does it cover ground that can be mined [illegible]ent economic demands for uranium? (4) Wh[illegible] previous production record and does this indica[illegible] properties are exhausted of ore? As proved by long e[illegible]rience the best indications as to what may be expect[illegible] on undeveloped property is what can be seen on adjacent developed ground. The grade and type of ore of any depo[illegible] be like the deposits found nearby although the [illegible]ive assurance that this will be the case.

The properties are located in the Todilto formation of Jurassic age which is rated in the top four uranium producing formations in the Colorado Plateau. Uranium mineralization occurs along the outcrop of the Todilto which extends approximately 65 miles from Thoreau to near Correo, along the Santa Fe Railway. Literally scores of ore bodies have been found by surface prospecting and also by drilling and geobotanical methods. The Santa Fe Uranium Company properties include and are adjacent to some of the better known deposits. Although many theories have been put forth to explain the localization of the ore no one theory has gained much support. The details of the various ideas need not be given here except to point out that no evidence exists which in

SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
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Relation of Uranium to the Todilto Limestone:

The Todilto formation consists of shale, limestone and gypsum and is thought to have been deposited in a shallow arm of the sea. Uranium is known only in the limestone beds which were apparently laid down in an intermediate position between the shore where shale was deposited and the deeper central part of the basin where gypsum was formed. The limestone occurs in thin beds and is seldom over 15 feet in thickness. In many places the formation exhibits numerous small-scale folds or crenulations and is also cut by fractures and joints. Much study has been made of possible effects of the folding and jointing on the formation of ore. Ore does seem to be localized and chiefly in the folds but relatively few of the folds are mineralized. Mapping of one of the chief mineralized areas showed that five out of seven ore bodies are localized on primary folds despite the fact that these folds occupy less than 10 per cent of the linear extent of the rim. No universally accepted ideas have been advanced which explain the time of origin of the ore and not much progress has been made on guides which will predict the presence of ore bodies hidden from view. In a few instances analysis of vegetation rooted in ore has helped in outlining mineralized ground but the use of the method is limited. Drilling remains the best method for proving ore and calculating reserves and so far drilling has been relatively easy since the overburden is shallow and easily penetrated.

Analysis of the Santa Fe Uranium Company Property:

Four questions must be answered as fully as possible in deciding on the value and potential of any property being considered for purchase

or lease: (1) Is it in a favorable formation. (2) Is it in a mineralized district, area or "trend", (3) Does it cover ground that can be mined under present economic demands for uranium and (4) What is the previous production record and does this indicate the properties are exhausted of ore. As proved by long experience the best indication as to what may be expected on undeveloped property is what can be seen on adjacent developed ground. The grade, type of ore, and probable size of any deposit is apt to be very much like the deposits found nearby. Since the Santa Fe Uranium Company properties are mostly undeveloped their potential must be judged largely by reference to adjoining ground.

The properties are located in the Todilto formation of Jurassic age which is rated in the top four uranium producing formations in the Colorado Plateau. Uranium mineralization occurs along the outcrop of the Todilto which extends approximately 65 miles from Thoreau to near Correo, along the Santa Fe Railway. Literally scores of ore bodies have been found by surface prospecting and also by drilling and geobotanical methods. The Santa Fe Uranium Company properties include and lie adjacent to some of the better known deposits. Although many theories have been put forth to explain the localization of the ore no one theory has gained much support. The details of the various ideas need not be given here except to point out that no evidence exists which in any way casts doubt on the possibility of ore under cover back of the present known deposits. In other words all evidence favors the interpretation that the ore bodies are probably just as numerous under cover as they are at the eroded and stripped edge of the formation where they are being mined at present.

This idea is vital to an evaluation of the district as a whole and in this instance particularly to the Santa Fe Uranium Company properties.

(d) Accessibility

The properties are located in the Grants uranium district, between Thoreau and Correo, New Mexico.

(d) Availability of Manpower, Materials, Supplies and Equipment:

Manpower, materials, supplies, equipment, etc., are available from Gallup, New Mexico, Grants, New Mexico and Albuquerque, New Mexico.

5. THE EXPLORATION PROJECT

(a) Objective

The sole objective of the exploration program is the discovery of uranium-vanadium ore.

(b) Proposed Work

The program of proposed work submitted for your consideration and examination is, at best, only tentative, since it is fully realized that at this stage neither the full scope of the project, if approved, nor the direction it will take, can be determied with any certainty. With these limitations in mind, it is possible to formulate a general plan of exploration which may serve as a basis for later discussions between the corporation and the DMEA.

So far as may be anticipated at this time, the exploratory work may be divided conveniently into three stages; the work in each new stage dependent upon the results obtained in the stage just completed. No rigid rules can be laid down, as any program to be successful must be reasonably flexible to permit alterations in plans as new data become available.

SANTA FE URANIUM COMPANY
620 Judge Building
Salt Lake City, Utah

It is obvious that the major costs for any program in the area will be represented by the cost of drilling. The amount of drilling required to thoroughly prospect the ground will be the basic factor governing the length of the project, and this factor, in turn, will largely control the overall costs. It is important, therefore, that some tentative drilling footages and depths should be determined in order that a basis may be established for submitting this application to your agency.

Phase 1 - Reference is made to Plate 1 (following Page 10) which will show the approximate number of holes, spaced on 1,000 foot center, which could be drilled within acreage available for exploration. It will be noted that the Santa Fe Company's claim group has been divided into three separate phases. Holes drilled on this coordinate spacing would be for the primary purpose of obtaining a better understanding of the sub-surface geologic conditions, especially those related to thicknesses, characteristics and mineralization of the formation. Data obtained in this Phase 1 drilling will help to establish within close limits the depths where coring of the formation should be commenced in subsequent holes.

The number of holes and the drilling footages for the area (Plate 1) may be estimated as follows:

Phase 1:	21 Holes	425 feet Average Depth	8925 Total Footage

It may be noted that the coordinate lines of the grid have been oriented in such a way as to be normal to what is considered the mineralized zone trend.

It may be noted that the coordinate lines of the grid have been oriented in such a way as to be normal to what is considered the mineralized zone trend.

Although the exact thickness of the Todilto is not known, it has been estimated for calculation purposes that 420 feet of coring will be necessary to penetrate this unit. This figure may possibly be reduced after several holes have been drilled and the mineralized zone definitely established.

Using this average for Phase 1, it is estimated that the 21 holes will require about 420 feet of coring and about 8505 feet of plugging with rotary bits.

It is suggested that core diameters should not be less than BX in size. The diameter of the hole from the surface to the top of the cored section will depend upon the equipment employed by the drilling contractor.

It is proposed to carry out standard radio-metric drill-hole logging during this and subsequent phases of the work.

Phase 2 - The overlay on Plate 1 (following Page 10 indicated the approximate number of holes required to explore the property on a 500-foot spacing.

Assuming for estimation purposes that such a program were carried out the footage and holes to be drilled may be calculated as follows:

37 Holes	465 Feet Average Depth	17205 Total Footage

It must be noted that the average depth of the holes varies somewhat in Phases 1 and 2 because of the varying number of holes in area 1 and 2 as indicated on Plate 1.

On the basis of 20 feet of coring per hole, the total cored footage would amount to 740 feet, leaving a balance of 16465 feet of plug-hole drilling.

Summary of Phases 1 and 2

A recapitulation of the drilling footages in Phases 1 and 2 are as follows:

Phase 1	Number of Holes	Feet of Coring	Feet of Plugged Drilling	Total Feet
1	21	420	8505	8925
2	37	740	16465	17205
	58	1160	24970	26130

Area (See Plate 1)	Number of Holes	Average Depth	Total Feet
1	25	383	9575
2	33	501.66	16555
	58		26130

The 26130 feet shown above for Phases 1 and 2 would represent the optimum possible footage.

Phase 3 - The maximum amount of drilling which may be required in this phase is less easily calculated than for the previous two phases. The objective of this phase is to outline any favorable ground with more closely spaced holes, in some cases this interval may be as small as 50 feet. 7

If we assume for calculation purposes that 50 per cent more drilling is required to establish a deposit found in Phase 1 and 2 drilling, an additional 13060 feet would be required.

Summary of Phases 1, 2 and 3

According to our estimates, a total of approximately 39190 feet of drilling will be required for this project.

(c) Time of work

The work will start within four weeks after the loan is granted, and will be completed within eight months.

(d) Operating Experience and Background of Applicant:

The project will be under the supervision of the following persons:

1. H. R. Brownson, Director and President

Education: University of Washington
Business Administration

Employment History:

Mr. Brownson has been engaged in the lumber business in Wenatchee and Seattle, Washington, for the past 25 years and has actively engaged in supplying the building industry throughout the area.

2. Hyrum Schnieder, Director and Vice-President

Doctor's Degree in Geology from University of Wisconsin
Fellow in Geological Society of America
The Mineralogical Society of America
The American Association for the Advancement of Science
Utah Academy of Science

Head of the Department of Geology at University of Utah from 1939 to 1948.

3. Lyle K. Campbell, Director

Degree in Mechanical Engineering
Masters Degree in Business Administration

Employment History:

Mr. Campbell is the manager of Construction Engineering Company and has been active in the construction business in Salt Lake City for the past four years.

4. Christopher Riley, Director

Education:

Doctor's Degree in Mining and Geology from the University of Chicago.

Employment History

Mr. Riley is a professional engineer, in charge of all exploration work for Pioneer Gold Mines (B.C.) Ltd., one of Canada's largest producers of gold.

5. A. D. Morgan, Secretary and Treasurer

Education: High School

Employment History:

Mr. Morgan has been engaged as a field representative for petroleum and mining interests in Canada for a number of years.

6. ESTIMATE OF COSTS

Costs for the project have been projected on a nine-month period for purposes of estimation, and we have used the total drilling footage of 39190 feet as a basis for calculations. These following costs, therefore, are based on a maximum figure, and for this reason the cost of the entire project will be considered as a whole.

Phases 1, 2 and 3

(a) Independent Contracts

(1)	39190 feet drilling @ $4.00 per foot	$156,760.00
(2)	Clearing drill sites, bulldozing, etc.	3,000.00
(3)	Assaying 75 samples @ $10.00 each	750.00
	Sub-Total	$160,510.00

(b) Labor, Supervision and Consultants

(1)	Common Labor 3 men @ $400 per month ($1,200 x 8)	9,600.00
(2)	Geologist ($600 per month x 8)	4,800.00
(3)	Recording Clerk ($300 per month x 8)	2,400.00
(4)	Superintendent ($800 per month x 8)	6,400.00
(5)	Consultants, Mining, Engineering and Geology	1,000.00
	Sub-Total	$24,200.00

(c)	Operating Materials and Supplies	$3,000.00
(d)	Operating Equipment	
	(1) Truck ($500 per month x 8)	4,000.00
	(2) Jeep Station Wagon ($400 per month x 8)	3,200.00
	Sub-Total	$10,200.00
(e)	Rehabilitation and Repairs	
(f)	Buildings Rent of building @ $150 for 8 months	1,200.00
(g)	Miscellaneous	6,000.00

Summary of Estimated Costs

(a)	Independent Contracts	$160,510.00
(b)	Labor, Supervision and Consultants	24,200.00
(c)	Operating Materials and Supplies	3,000.00
(d)	Operating Equipment	7,200.00
(e)	Rehabilitation and Repairs	
(f)	Buildings	1,200.00
(g)	Miscellaneous	6,000.00
		$202,110.00
(h)	Add 10% for Contingencies	20,211.00
	Total Estimated Costs	$222,321,00

7. PARTICIPATION OF THE CORPORATION

The Corporation is prepared to furnish its share of the cost of the proposed project in accordance with the regulation of government participation.

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June 10, 1954

Santa Fe Uranium Company
620 Judge Building
Salt Lake City 1, Utah

Dear Sirs:

Attached you will find our report and accompanying map pertaining to the three 160 acre tracts under lease to the Santa Fe Uranium Company and located near Grants, New Mexico.

As you will note from our geological report, we feel very optimistic about the Uranium ore producing potentiality of your property.

If we can be of further service to you, please feel free to call upon us. We authorize the use of said report in connection with the public offering and offering circular to be made and used by the Company.

Sincerely yours,

GEOPROFESSIONAL SERVICES, INC.,

A. J. Eardley

A. J. Eardley

F. W. C. by NCW A. J. E.

F. W. Christiansen

Norman C. Williams

Norman C. Williams

NCW:ns
Enclosure

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REPORT ON THE SANTA FE URANIUM COMPANY PROPERTIES, GRANTS, NEW MEXICO

INTRODUCTION

The Santa Fe Uranium Company uranium properties comprise three tracts of 160 acres each. The properties are centrally located in the Grants uranium district which extends for approximately 65 miles along the southern flank of the San Juan basin between Thoreau and Correo, New Mexico. Specifically, the properties are the SW$\frac{1}{4}$, Sec. 18, T. 13 N., R. 10 W; NW$\frac{1}{4}$, Sec. 24, T. 13 N., R. 11 W.; N$\frac{1}{2}$, N$\frac{1}{2}$, Sec. 13, T. 13 N., R. 11 W.

Uranium was discovered in the Grants area in 1950, in the NE$\frac{1}{4}$, Sec 19, T. 13 N., R. 10 W., adjacent to two of the Santa Fe Uranium Company quarter-sections. Compared to other uranium districts of the Colorado Plateau, the Grants district is of relatively recent discovery and is in an early stage of development. The Grants district has not yet entered the stage of feverish land play which exists, for example, in southeastern Utah. Nevertheless, the district is well established and portends to become of major importance. Numerous new mines are being developed and the Anaconda Copper Mining Company is expanding mill facilities at Grants, New Mexico, to accommodate the increase of production of ore.

General Geology

Rocks exposed in the Grants uranium district include Triassic, Jurassic and Gretaceous formations which are mainly of continental origin. Ore has been found in the Todilto limestone, the Morrison and Dakota sandstone. Production from each of these formations has been significant and promises to increase.

The district lies mainly on the northeast flank of the Zumi uplift and the beds dip gently northward into the San Juan Basin. The hard and soft formations outcrop as cliffs and slopes, the

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harder beds, including the Todilto limestone, forming wide dip slopes. The Todilto outcrops are near the valley level and transportation and road building to the chief ore deposits have been relatively easy.

The ore consists of a variety of minerals but the outstanding characteristic is the high content of limestone that must be mined and treated to extract the uranium. This type of ore is much different from the sandstone type long mined from the Morrison formation. The new Anaconda mill which is designed specifically for limestone ores will greatly stimulate mining.

Relation of Uranium to the Todilto Limestone

The Todilto formation consists of shale, limestone and gypsum and is thought to have been deposited in a shallow arm of the sea. Uranium is known only in the limestone beds which were apparently laid down in an intermediate position between the shore where shale was deposited and the deeper central part of the basin where gypsum was formed. The limestone occurs in thin beds and is seldom over 15 feet in thickness. In many places the formation exhibits numerous small-scale folds or crenulations and is also cut by fractures and joints. Much study has been made of possible effects of the folding and jointing on the formation of ore. Ore does seem to be localized and chiefly in the folds but relatively few of the folds are mineralized. Mapping of one of the chief mineralized areas showed that five out of seven ore bodies are localized on primary folds despite the fact that these folds occupy less than 10 percent of the linear extent of the rim. No universally accepted ideas have been advanced which explain the time of origin of the ore and not much progress has been made on guides which will predict the presence of ore bodies hidden from view. In a few instances analysis of vegetation rooted in ore has helped in outlining mineralized ground but the use of the method is limited. Drilling remains the best method for proving ore and calculating reserves and so far drilling has been relatively easy since the overburden is shallow and easily penetrated.

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Analysis of the Santa Fe Uranium Company Property

Four questions must be answered as fully as possible in deciding on the value and potential of any property being considered for purchase or lease: (1) Is it in a favorable formation. (2) Is it in a mineralized district, area or "trend", (3) Does it cover ground that can be mined under present economic demands for uranium and (4) What is the previous production record and does this indicate the properties are exhausted of ore. As proved by long experience the best indication as to what may be expected on undeveloped property is what can be seen on adjacent developed ground. The grade, type of ore, and probable size of any deposit is apt to be very much like the deposits found nearby. Since the Santa Fe Uranium Company properties are mostly undeveloped their potential must be judged largely by reference to adjoining ground.

The properties are located in the Todilto formation of Jurassic age which is rated in the top four uranium producing formations in the Colorado Plateau. Uranium mineralization occurs along the outcrop of the Todilto which extends approximately 65 miles from Thoreau to near Correo, along the Santa Fe Railway. Literally scores of ore bodies have been found by surface prospecting and also by drilling and geobotanical methods. The Santa Fe Uranium Company properties include and lie adjacent to some of the better known deposits. Although many theories have been put forth to explain the localization of the ore no one theory has gained much support. The details of the various ideas need not be given here except to point out that no evidence exists which in any way casts doubt on the possibility of ore under cover back of the present known deposits. In other words all evidence favors the interpretation that the ore bodies are probably just as numerous under cover as they are at the eroded and stripped edge of the formation where they are being mined at present. This idea is vital to an evaluation of the district as a whole and in this instance particularly to the Santa Fe Uranium Company properties.

The area in the immediate vicinity of the Santa Fe Uranium Company properties is known as one of the largest producers of

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of Todilto type ore in the Grants district. This is one of the most favorable factors regarding the properties. As shown by the appended map, the two southern tracts of the Santa Fe Uranium Company property directly adjoin and partially surround the very large and productive mines of the Santa Fe Railroad Company. While some of the ground within Sec. 24 lies below the Todilto formation and has little value, some of it covers exposed Todilto and also thinly covered favorable ground. In fact this area has, as of April 30, 1954, already produced ore having a value of $301,932.81 and has not been fully explored. The tract in Sec. 18 of the area appears to have cover which can be economically removed if ore is being followed or has been located by drilling. The northern tract, in Sec. 13 has deeper cover but the productive formation is still within the range of economic development.

PRODUCTION DATA
(to May 1, 1954)

SW$\frac{1}{4}$, Sec. 18, T. 13 N., R. 10 W.
Average U_3O_8 content $\not{/}$0.23--value $45,813.18

NE$\frac{1}{4}$, Sec. 24, T. 13 N., R. 11 W.
Average U_3O_8 content $\not{/}$0.23--value $301,932.81

ORE RESERVES

On April 30, stripping operations had exposed a bench of ore-grade Todilto limestone which was measured and calculated to contain 17,000 to 20,000 tons of ore. Since this date, the chief activity has consisted of drilling to determine the trends of known ore bodies and to establish new reserves. On June 5, 1954, 45 drill holes had been completed and these were examined and tested with the Geiger probe to determine the tenure and tonnage of newly found ore. The 45 drill holes are spaced from 15 to 23 feet apart and have tested an area comprising 36,800 square feet. Of the 45 drill holes, 8 had collapsed and no data were obtainable. The remaining 37 holes were all in mineralized formation and indicated

ore ranging from .20% U_3O_8 to 1.80% U_3O_8. Thickness of the ore bearing bed ranges from 10 to 20 inches. The 36,800 square foot areas averages 1 foot of .40% U_3O_8 ore which reduced to an optimum grade of .21% U_3O_8 would permit of approximately a two foot mineable zone containing about 6,500 tons. This 6,500 tons represents a reserve of mineable ore which is in addition to the 17,000 to 20,000 tons of exposed ore.

To date, the ore on the Santa Fe Uranium Company properties, and on large adjacent ore bodies has demonstrated a remarkably uniform grade. The average U_3O_8 content ranges from 0.20 to 0.26. Higher and lower content is present, but for overall economy, the operators seek to maintain an average shipping grade of 0.21 to 0.24% U_3O_8.

SUMMARY

The Santa Fe Uranium Company properties are considered favorable for the production of uranium ore on a profitable basis for the following reasons.

(1) They are located on the productive Todilto limestone and cover structures (folds) and types of rock that are favorable to ore formations by all known criteria.

(2) They are in geographically favorable territory. The SW¼, Sec. 18 and NW¼, Sec. 24 are immediately adjacent to the large and highly productive tracts owned by the Santa Fe Railroad Company. Production from these adjacent tracts has averaged over 200 tons of ore per day for more than one year.

(3) To date, mining has been from easily discovered surface exposures and has chiefly "followed the ore." Much untested ground remains to be explored.

(4) Drill holes have encountered ore in the SW¼, SW¼, Sec. 18.

(5) The uniform tenure of the ore, demonstrated ore reserves, close proximity to milling facilities, and ease of mining are features which contribute to the economic attractiveness of the Santa Fe Uranium Company properties.

Submitted by,
GEOPROFESSIONAL SERVICES, INC.,

A. J. Fardley

A. J. Fardley

F.W.C. by NCW G. J. F.

F. W. Christiansen

Norman C. Williams

Norman C. Williams

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A G R E E M E N T

THIS AGREEMENT made and entered into this 21ST day of May, 1954, by and between GLENN D. WILLIAMS and EDITH A. WILLIAMS, his wife, of Gallup, New Mexico, hereinafter referred to as "First Parties", and SANTA FE URANIUM COMPANY, INC., a Utah corporation, hereinafter referred to as "second Party",

W I T N E S S E T H

WHEREAS, First Parties are the owners of assigned mining leases which are attached hereto and made a party hereof and which are identified as Exhibits A, B, and C, being assigned mining leases covering lands in the County of McKinley (Eastern Navajo) in the State of New Mexico, more particularly described as follows, to wit:

1. Lease from Non a.bah Vandever, being Contract No. I-149-Ind-8912, covering NE$\frac{1}{4}$ of Section 24, Township 13 North, Range 11 West, N.M.P.M., said Lease having been recorded in Book 8 of Leases, Page 146 of the Records in the office of the County Clerk of McKinley County, N.M., and

2. Lease from Brown Vandever, being Contract No. I-149-Ind-8913, covering Lots 3 & 4 and E$\frac{1}{2}$ SW$\frac{1}{4}$ of Section 18, Township 13 North, Range 10 West, N.M.P.M. said Lease having been recorded in Book 8 of Leases, page 154 of said records, and

3. Lease from Walter Vandever, being Contract No. I-149-Ind-8911, covering N$\frac{1}{2}$N$\frac{1}{2}$ of Section 13, Township 13 North, Range 11 West, N.M.P.M., said Lease having been recorded in Book 8 of Leases, Page 162 of said records; and

WHEREAS, J. T. HUTTON and PARALEE HUTTON, his wife, have assigned, executed and delivered to First Parties proper assign-

2. Second Party agrees to pay to First Parties an additional Fifty Thousand Dollars ($50,000.00) within sixty (60) days from the date of the Bureau of Indian Affairs approves the assignment from First Parties to Second Party of the foregoing described properties.

3. Second Party agrees to pay the remaining Two Hundred Thirty Thousand Dollars ($230,000.00) of the purchase price out of mining operations as follows, to wit:

   a. One Hundred Thousand Dollars ($100,000.00) on or before January 15, 1955 to be paid from escrow funds deposited in the First State Bank of Gallup, New Mexico, accumulated from ores milled and mined from the foregoing premises on the basis of Six Dollars ($6.00) per dry ton. Second Party further agrees to secure the minimum payment of the aforesaid One Hundred Thousand Dollars ($100,000.00) by promissory notes made on the basis of Four Dollars ($4.00) per dry ton of all ores milled and mined from said premises, said notes to be payable on or before January 15, 1955.

      In the event there is an accumulation of escrow funds in the amount of One Hundred Thousand Dollars ($100,000.00) before January 15, 1955, First Parties shall at their option have the right to receive said sum prior to the 15th day of January, 1955. In the event said escrow funds exceed the sum of One Hundred Thousand Dollars ($100,000.00) prior to January 15, 1955, said accumulations in excess of One Hundred Thousand Dollars ($100,000.00) shall be retained in escrow to secure the payment of the second One Hundred Thirty Thousand Dollars ($130,000.00) as hereinafter provided in paragraph 3 (b) herein.

   b. One Hundred Thirty Thousand Dollars ($130,000.00) on or before January 15, 1956, payable out of funds accumulated in escrow on the basis of Six Dollars ($6.00) per dry ton, together with Second Party's promissory note payable to First Parties in the amount of Four Dollars ($4.00) per dry ton payable on or before January 15, 1956.

      In the event there is an accumulation of escrow funds in the amount of One Hundred Thirty Thousand Dollars ($130,000.00) before January 15, 1956, First Parties shall at their option have the right to receive said sum prior to the 15th day of January, 1956.

ments of their interest in and to the aforesaid mining lease contracts on the forms provided therefor by the Bureau of Indian Affairs, and

WHEREAS, said assignments have been approved by the Bureau of Indian Affairs and

WHEREAS, First Parties have agreed to pay to the aforesaid J. T. Hutton or his assigns a three percent (3%) royalty on all uranium ores mined and milled from said properties as shown in the attached Agreement and identified as Exhibit "D", and

WHEREAS, First Parties desire to assign to Second Party all of its right and interest remaining in the foregoing leases identified as contract Nos. I-149-Ind-8911, I-149-Ind-8912 and I-149-Ind-8913, subject to the approval of the Bureau of Indian Affairs and subject to a three percent (3%) royalty payable to J. T. Hutton or his assigns, and

WHEREAS, the Second Party desires to purchase the same for the sum of Three Hundred Thousand Dollars ($300,000.00);

NOW THEREFORE, it is mutually agreed by and between the parties as follows, to wit:

1. Second Party will place in escrow on or before the 24th day of May, 1954, at the First State Bank of Gallup, New Mexico, Twenty Thousand Dollars ($20,000.00), which sum will be payable to the First Parties upon delivery to the said Bank by the First Parties of a properly assigned lease or properly assigned leases approved by the Bureau of Indian Affairs, transferring to Second Party the interest now held by First Parties in and to the properties herein described and referred to in the leases identified as Nos. I-149-Ind-8911, I-149-Ind-8912 and I-149-Ind-8913.

c. The foregoing payments shall be made on or before the due dates thereof, and are not to be deemed conditioned on the existence of sufficient funds in escrow from ore production to make such payments.

4. It is understood and agreed by and between the undersigned that the balance of the purchase price as herein provided shall not bear interest.

5. It is understood and agreed by and between the parties hereto that Second Party will undertake and pay to J. T. Hutton the three percent (3%) royalty which First Parties are now obligated to pay to the said J. T. Hutton from any uranium ores mined from the aforesaid properties, as shown in the attached Agreement identified herein.

6. It is understood and agreed by and between the undersigned that the Second Party will assume and undertake to pay to the GEOPROFESSIONAL SERVICES, INC. any sums which may be due and owing to them from the First Parties by reason of the services of the GEOPROFESSIONAL SERVICES, INC. in rendering services and assisting the First Parties in disposing of their properties.

7. In the event the First Parties are unable to secure, within sixty (60) days, approval from the Bureau of Indian Affairs of the assignment from the First Parties to the Second Party of the foregoing leases, then in that event, said Second Party shall be entitled to a refund to them of Twenty Thousand Dollars ($20,000.00) placed in escrow as herein provided and the parties hereto shall be relieved thereafter of any obligation incurred by reason of this agreement.

8. It is understood and agreed by and between the undersigned that pending the approval from the Bureau of Indian Affairs of the assignments herein referred to, First Parties shall have the right to mine and stockpile ores on the premises and that Second Party shall pay to First Parties the reasonable cost of said operations during said period. Second Party shall be entitled to the proceeds received from all of said ores, subject to the provisions of this lease as herein stated.

9. It is understood and agreed by and between the undersigned that in the event the Second Party becomes in default in any of the payments as herein provided, that the First Parties shall notify the Second Party by registered mail of such default and that in the event said Second Party does not place the contract in good standing by making up the default payments as herein provided for within thirty (30) days from receipt of said notice, said First Parties shall have the immediate right to terminate said contract

and declare the said sums paid herein forfeited as liquidated damage.

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

Glenn D. Williams (Seal)
Glenn D. Williams

Edith A. Williams (Seal)
Edith A. Williams

SANTA FE URANIUM COMPANY

By _____
Its President

STATE OF NEW MEXICO)
: ss.
County of McKinley)

On this 26th day of May, 1954, before me personally appeared Glenn D. Williams and Edith A. Williams, husband and wife, to me known to be the persons described in and who executed the foregoing instrument and acknowledged that they executed the same. Witness my hand and seal the day and year above written.

_____
Notary Public
Residing at: Gallup, N.M.

My Commission Expires:
12/30/54

STATE OF UTAH)
: ss.
County of Salt Lake)

On this 21st day of May, 1954, before me personally appeared [illegible], President of the Santa Fe Uranium Company, to me known to be the person described in and who executed the foregoing instrument on behalf of the Santa Fe Uranium Company and acknowledged that he executed the same as a free act and deed of the Santa Fe Uranium Company and that he was duly authorized by resolution of the said company to execute said instrument. Witness my hand and seal the day and year above written.

[illegible]
Notary Public

Residing at: Salt Lake City, Ut.

My Commission Expires:

April 16, 1957

5-154e
(May 1940)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

CONTRACT NO.
I-149-IND-8912

ASSIGNMENT OF MINING LEASE

WHEREAS, the Secretary of the Interior has heretofore approved Uranium mining lease, dated the 7th day of June, 1954, entered into by and between NON A BAH VANDEVER, Navajo Indian Allottee 059419, lessor, and GLENN D. WILLIAMS and J. T. HUTTON, lessee, covering the following-described lands in the County of McKinley (Eastern Navajo) (Insert name of Reservation, Pueblo, Nation, etc., as needed) in the State of New Mexico, to wit:

The North East Quarter of
Section 24
Township 13 North, Range 11 West, N.M.P.M.
Containing 160 Acres

BUREAU OF INDIAN AFFAIRS
RECEIVED
JUL 6 1954
9936
Washington, D.C.

NOW, THEREFORE, for and in consideration of One and no/100 dollars ($1.00), the receipt of which is hereby acknowledged, the said Glenn D. Williams (Assignee of J. T. Hutton and Paralee Hutton, his wife) (whose wife, Edith A. Williams, joins him in the execution hereof) the owner of the above-described lease, hereby bargains, sells, transfers, assigns, and conveys All their right, title, and interest in and to said lease, and all their right, title and interest in and to the land therein described

subject to the approval of the Secretary of the Interior, to Santa Fe Uranium Company, of Salt Lake City, Utah

Said assignment to be effective from date of approval ~~hereby~~ of by the Secretary of the Interior.

IN WITNESS WHEREOF, the said assignor has hereunto set our hand and seal, this 23rd day of June, 1954

Glenn D. Williams
Edith A. Williams

16—11683-2

[OVER]

ACKNOWLEDGMENT OF CORPORATION

STATE OF .....
COUNTY OF ..... } ss:

Before me, a notary public, in and for said county and State on this ..... day of ....., 19.....
personally appeared .....
me known to be the identical person who subscribed the name of the maker thereof to the foregoing instrument as its ..... and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

.....
Notary Public.

My commission expires ....., 19.....

ACKNOWLEDGMENT OF INDIVIDUAL

STATE OF New Mexico
COUNTY OF McKinley } ss:

Before me, a notary public, in and for said county and State, on this 23rd day of June, 1954
personally appeared GLENN D. WILLIAMS and EDITH A. WILLIAMS, his wife
.....
.....
....., to me known to be the identical persons who executed the within and foregoing instrument, and acknowledged to me that they executed the same as their free and voluntary act and deed for the uses and purposes therein set forth.

John E. Perry
Notary Public.

My commission expires December 30, 1954

ACCEPTANCE BY ASSIGNEE

The assignee in the above and foregoing assignment, made subject to the approval of the Secretary of the Interior, hereby accepts such assignment and agrees to fulfill all the obligations, conditions, and stipulations in said described indenture of lease, when assigned, and the rules and regulations of the Secretary of the Interior applicable thereto, and to furnish proper bond guaranteeing a faithful compliance with said lease and this agreement.

IN WITNESS WHEREOF, the said assignee has hereunto set our hand and seal this 23rd day of June, 1954

SANTA FE URANIUM COMPANY

By Noland H. Schneider
Vice President

ATTEST:
E. Shope
Secretary

CONSENT OF SURETY

The CENTRAL SURETY AND INSURANCE CORPORATION, of Kansas City, Missouri, surety for Glenn D. Williams on the bond accompanying the lease above described, hereby consents to the assignment and transfer of said lease as above made and agrees that said bond shall remain in force and effect covering obligations of assignee.

Dated at Kansas City, Missouri this 11th day of June, 1954

CENTRAL SURETY AND INSURANCE CORPORATION

By J. F. Daniel
J. F. Daniel, Attorney-in-Fact

RECEIVED JUN 10 1954 CENTRAL SURETY CORPORATION

UNITED STATES
DEPARTMENT OF THE INTERIOR,
Washington, D. C., JUL - 9 1954

APPROVED: (Sgd) H. M. Dale Field
~~Commissioner~~ *of Indian Affairs.*
Chief, Branch of Realty

Approved under authority delegated by Secretarial Order No. 2508, January 11, 1949 (14 F.R. 259) and Order No. 551, Amendment 7 (19 F.R. 1330).

U. S. GOVERNMENT PRINTING OFFICE

Form 5-154
(October 1939)

CONTINUATION SHEET

Contract No.
I-149-Ind-8912

MINING LEASE ALLOTTED INDIAN LANDS
(For Minerals other than Oil and Gas)

The Lessee hereby agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, as royalty, the sums of money as follows:

Percentage Royalty Schedule

Mine Value Per Dry Ton	Royalty Percentage of Mine Value Per Dry Ton
$ 0.01 to $ 10.01	10%
$ 10.01 to $ 20.01	11%
$ 20.01 to $ 30.01	12%
$ 30.01 to $ 40.01	13%
$ 40.01 to $ 50.01	14%
$ 50.01 to $ 60.01	15%
$ 60.01 to $ 70.01	16%
$ 70.01 to $ 80.01	17%
$ 80.01 to $ 90.01	18%
$ 90.01 to $100.01	19%
$100.01 or more	20%

"MINE VALUE PER DRY TON", wherever used herein is hereby defined as the dollar value per dry ton of crude ores at the mine as paid for by the Atomic Energy Commission or other government agency before allowance for transportation and development; however, if the government at any time hereafter does not establish and pay for said ores on a fixed or scheduled dollar value per dry ton of crude ores at the mine, or said ores contain saleable minerals, some, or all, of which are disposed of to a custom treatment plant or smelter for treatment and sale, then mine value per dry ton shall be the gross value per dry ton of said crude ore as paid for by the Atomic Energy Commission or other government authorized agency mill or other buyer, less any allowances or reimbursements for the following specific items: (1) transportation of ores; (2) allowances for exploration for, or development of ores; and (3) treatment or beneficiation of ores; which specific items shall in such event be deducted from the gross sales price received from the metal content of said ores by the seller before said percentage royalty is calculated and paid. Such payments shall be made on or before the fifteenth (15th) day of the month next following receipt by Lessee of payment for said ores together with a statement of the mine value of said ores and the amount of royalty due on each lot shipped and sold.

In addition to the above royalty payments there shall be paid to the Superintendent for the use and benefit of the Lessor 10% of any bonus paid by the United States Atomic Energy Commission for the production of ore from the above lease and particularly bonuses for the initial production of uranium ore from said lease. But this provision shall not be limited to bonuses for initial production but shall apply to any and all bonuses paid for the production of ore.

Witness:
M. D. Long
Ruby Foster

150

Annual Rental

The Lessee agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, in advance beginning with the date of approval of the lease as annual rental, the sum of One ($1.00) Dollar per acre for the first calendar year and the sum of One ($1.00) Dollar per acre, in advance, for each and every calendar year thereafter during the continuation of this lease.

The rentals so paid shall not be a credit on the royalties accruing under this lease and shall not be refunded to the Lessee because of any subsequent surrender or cancellation of the lease.

Development

The land described herein shall not be held by the Lessee for speculative purposes but in good faith for mining mineral specified. The Lessee shall expend in the development of said lease in each year the sum of Ten ($10.00) Dollars per acre. Such development shall consist of road building, prospecting or drilling and mining operations, and the Lessee shall each year submit to the Superintendent satisfactory reports regarding development expenditures, which reports shall be furnished within ten (10) days after the yearly anniversary date of the lease; and failure by the Lessee in the diligent development and continued operation of the mine or mines, or the expenditures of the sum provided herein for the development of said lease in each year except when the operations may be interrupted by strikes, the elements or casualties not attributable to the Lessee, shall be held as want of compliance with the purposes of this lease and shall render it subject to cancellation; provided that whenever the Secretary of the Interior shall consider the marketing facilities inadequate or economical conditions unsatisfactory he may authorize the suspension of operations for such time as he may deem advisable but such action will not release the Lessee from the payment of the advance annual rental.

Payment for Surface Damage

The Lessee shall pay to the Superintendent for the use and benefit of the Lessor, as damage to the surface of the lands covered by this lease, Ten ($10.00) Dollars per acre for each acre of land upon which the vegetation of any kind is destroyed or on which the top soil may be removed, turned or damaged by the mining operations conducted on said lease, but not including the reasonable use of the surface for roads and the construction of facilities for the operation of this lease. Provided, however, that in the event the royalty payments made under this lease shall equal or exceed the amount due for surface damages as provided in this paragraph then and in that event the Lessee shall be released from the obligation to pay such surface damages.

4

The Lessee shall not be permitted to surrender or terminate this lease until the damages provided for in this paragraph have been paid and in the event of the cancellation or forfeiture of this lease by the Secretary of the Interior as provided in said lease, the Lessee shall remain obligated to pay for surface damages as herein provided and the bondsmen of the Lessee shall not be released from liability until such surface damages are paid. The extent of the surface damages and the amount due therefor, shall be determined by the Secretary of the Interior.

The lessee shall employ Navajo labor in all positions for which they are qualified, including truck drivers, and shall protect the Indian grazing rights and other Indian rights to the surface of the lands.

The lessee shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and shall require an identical provision to be included in all subcontracts hereunder.

Two witnesses to signature of Lessee

M. D. Long

Ruby Foster

Lessee

L. J. Hutton

(~~Attest~~)

her mark

Two witnesses to signature of Lessor

M. D. Long

Ruby Foster

Non-a-bah Vanderver

Lessor

Lessor

Lessor

Lessor

Lessor

Lessor

5-154 c
(May 1949)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

DEC - 8 1953

CONTRACT NO.
I-149-Ind-8913

ASSIGNMENT OF MINING LEASE

WHEREAS, the Secretary of the Interior has heretofore approved Uranium mining lease, dated the 7 day of June, 19 51, entered into by and between Brown Vandever, Allottee 077031, lessor, and Glenn D. Williams and J. T. Hutton, lessee, covering the following-described lands in the County of McKinley (Eastern Navajo) (Insert name of Reservation, Pueblo, Nation, etc., as needed) in the State of New Mexico, to-wit:

Lots 3, 4, E½ SW¼ of
Section 18,
Township 13 North, Range 10 West, N.M.P.M.
Containing 163.38 acres

BUREAU OF INDIAN AFFAIRS
RECEIVED
NOV 16 1953
17381
Washington, D. C.

NOW, THEREFORE, for and in consideration of One and no/100 dollars ($ 1.00), the receipt of which is hereby acknowledged, the said J. T. Hutton, together with Parallee Hutton, his wife, two of the owner~~s~~ of the above-described lease, hereby bargain~~s~~, sell~~s~~, transfer~~s~~, assign~~s~~, and convey~~s~~ all of their right, title, and interest in and to said lease, and all of their right, title and interest in and to the land therein described, subject to the approval of the Secretary of the Interior, to Glenn D. Williams, of Gallup, New Mexico.

Said assignment to be effective from date of approval here~~by~~of by the Secretary of the Interior.

IN WITNESS WHEREOF, the said assignor~~s~~ have hereunto set their hand~~s~~ and seal~~s~~ this 26th day of January, 19 53.

J. T. Hutton (Seal)
Parallee Hutton (Seal)

16—11683-2

[OVER]

6

ACKNOWLEDGMENT OF CORPORATION

STATE OF .....
COUNTY OF ..... } ss:

Before me, a notary public, in and for said county and State on this ..... day of ....., 19..... personally appeared .....
to me known to be the identical person who subscribed the name of the maker thereof to the foregoing instrument as its ..... and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

My commission expires ....., 19..... .....
Notary Public.

ACKNOWLEDGMENT OF INDIVIDUAL

STATE OF New Mexico
COUNTY OF McKinley } ss:

Before me, a notary public, in and for said county and State, on this 5th day of February, 1953 personally appeared J. T. Hutton and Parallee Hutton, husband and wife .....
....., to me known to be the identical persons who executed the within and foregoing instrument, and acknowledged to me that they executed the same as their free and voluntary act and deed for the uses and purposes therein set forth.

My commission expires 5/28, 1953 .....
Notary Public.

ACCEPTANCE BY ASSIGNEE

The assignee in the above and foregoing assignment, made subject to the approval of the Secretary of the Interior, hereby accepts such assignment and agrees to fulfill all the obligations, conditions, and stipulations in said described indenture of lease, when assigned, and the rules and regulations of the Secretary of the Interior applicable thereto, and to furnish proper bond guaranteeing a faithful compliance with said lease and this agreement.

IN WITNESS WHEREOF, the said assignee has hereunto set his hand and seal this 5th day of February, 1953.

Glenn D. Williams (Seal)

CONSENT OF SURETY

The ....., of ....., surety for ..... on the bond accompanying the lease above described, hereby consents to the assignment and transfer of said lease as above made and agrees that said bond shall remain in force and effect covering obligations of assignee.

Dated at ..... this ..... day of ....., 19.....

UNITED STATES
DEPARTMENT OF THE INTERIOR,

Washington, D. C., DEC 8 1953

APPROVED:

(Sgd) E. L. UTZ
Assistant *Commissioner of Indian Affairs.*

16—11683-2 U. S. GOVERNMENT PRINTING OFFICE

7

DEPARTMENT OF THE INTERIOR
Lessee Minerals Administration
RECEIVED
MAR 1 6 1955

Form 5-154
(October 1939)

CONTINUATION SHEET

Contract No.
I-149-Ind-8913

MINING LEASE ALLOTTED INDIAN LANDS
(For Minerals other than Oil and Gas)

The Lessee hereby agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, as royalty, the sums of money as follows:

Percentage Royalty Schedule

Mine Value Per Dry Ton	Royalty Percentage of Mine Value Per Dry Ton
$ 0.01 to $ 10.01	10%
$ 10.01 to $ 20.01	11%
$ 20.01 to $ 30.01	12%
$ 30.01 to $ 40.01	13%
$ 40.01 to $ 50.01	14%
$ 50.01 to $ 60.01	15%
$ 60.01 to $ 70.01	16%
$ 70.01 to $ 80.01	17%
$ 80.01 to $ 90.01	18%
$ 90.01 to $100.01	19%
$100.01 or more	20%

"MINE VALUE PER DRY TON", wherever used herein is hereby defined as the dollar value per dry ton of crude ores at the mine as paid for by the Atomic Energy Commission or other government agency before allowance for transportation and development; however, if the government at any time hereafter does not establish and pay for said ores on a fixed or scheduled dollar value per dry ton of crude ores at the mine, or said ores contain saleable minerals, some, or all, of which are disposed of to a custom treatment plant or smelter for treatment and sale, then mine value per dry ton shall be the gross value per dry ton of said crude ore as paid for by the Atomic Energy Commission or other government authorized agency mill or other buyer, less any allowances or reimbursements for the following specific items: (1) transportation of ores; (2) allowances for exploration for, or development of ores; and (3) treatment or beneficiation of ores; which specific items shall in such event be deducted from the gross sales price received from the metal content of said ores by the seller before said percentage royalty is calculated and paid. Such payments shall be made on or before the fifteenth (15th) day of the month next following receipt by Lessee of payment for said ores together with a statement of the mine value of said ores and the amount of royalty due on each lot shipped and sold.

In addition to the above royalty payments there shall be paid to the Superintendent for the use and benefit of the Lessor 10% of any bonus paid by the United States Atomic Energy Commission for the production of ore from the above lease and particularly bonuses for the initial production of uranium ore from said lease. But this provision shall not be limited to bonuses for initial production but shall apply to any and all bonuses paid for the production of ore.

Brown Vanderer
Witness
M. E. Kang
Ruby Foster

Annual Rental

The Lessee agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, in advance beginning with the date of approval of the lease as annual rental, the sum of One ($1.00) Dollar per acre for the first calendar year and the sum of One ($1.00) Dollar per acre, in advance, for each and every calendar year thereafter during the continuation of this lease.

The rentals so paid shall not be a credit on the royalties accruing under this lease and shall not be refunded to the Lessee because of any subsequent surrender or cancellation of the lease.

Development

The land described herein shall not be held by the Lessee for speculative purposes but in good faith for mining mineral specified. The Lessee shall expend in the development of said lease in each year the sum of Ten ($10.00) Dollars per acre. Such development shall consist of road building, prospecting or drilling and mining operations, and the Lessee shall each year submit to the Superintendent satisfactory reports regarding development expenditures, which reports shall be furnished within ten (10) days after the yearly anniversary date of the lease; and failure by the Lessee in the diligent development and continued operation of the mine or mines, or the expenditures of the sum provided herein for the development of said lease in each year except when the operations may be interrupted by strikes, the elements or casualties not attributable to the Lessee, shall be held as want of compliance with the purposes of this lease and shall render it subject to cancellation; provided that whenever the Secretary of the Interior shall consider the marketing facilities inadequate or economical conditions unsatisfactory he may authorize the suspension of operations for such time as he may deem advisable but such action will not release the Lessee from the payment of the advance annual rental.

Payment for Surface Damage

The Lessee shall pay to the Superintendent for the use and benefit of the Lessor, as damage to the surface of the lands covered by this lease, Ten ($10.00) Dollars per acre for each acre of land upon which the vegetation of any kind is destroyed or on which the top soil may be removed, turned or damaged by the mining operations conducted on said lease, but not including the reasonable use of the surface for roads and the construction of facilities for the operation of this lease. Provided, however, that in the event the royalty payments made under this lease shall equal or exceed the amount due for surface damages as provided in this paragraph then and in that event the Lessee shall be released from the obligation to pay such surface damages.

9

The Lessee shall not be permitted to surrender or terminate this lease until the damages provided for in this paragraph have been paid and in the event of the cancellation or forfeiture of this lease by the Secretary of the Interior as provided in said lease, the Lessee shall remain obligated to pay for surface damages as herein provided and the bondsmen of the Lessee shall not be released from liability until such surface damages are paid. The extent of the surface damages and the amount due therefor, shall be determined by the Secretary of the Interior.

The lessee shall employ Navajo labor in all positions for which they are qualified, including truck drivers, and shall protect the Indian grazing rights and other Indian rights to the surface of the lands.

The lessee shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and shall require an identical provision to be included in all subcontracts hereunder.

Two witnesses to signature of Lessee

M. D. Long

Lessee

(Attest)

Two witnesses to signature of Lessor

M. D. Long

his mark

Brown Vandever
Lessor

Lessor

Lessor

Lessor

Lessor

Lessor

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 1 6 1955

E-1340
(May 1949)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

CONTRACT NO.
I-149-Ind-8911

ASSIGNMENT OF MINING LEASE

WHEREAS, the Secretary of the Interior has heretofore approved Uranium mining lease, dated the 7 day of June, 1951, entered into by and between Walter Vandever, Allottee 077411, lessor, and Glenn D. Williams and J. T. Hutton, lessee, covering the following-described lands in the County of McKinley (Eastern Navajo) (Insert name of Reservation, Pueblo, Nation, etc., as needed) in the State of New Mexico, to-wit:

The North half of North half of
Section 13,
Township 13 North, Range 11 West, N.M.P.M.
Containing 160 acres

NOW, THEREFORE, for and in consideration of One and no/100 dollars ($1.00), the receipt of which is hereby acknowledged, the said J. T. Hutton, together with Parallee Hutton, his wife, two of the owner of the above-described lease, hereby bargain, sell, transfer, assign, and convey all of their right, title, and interest in and to said lease, and all of their right, title and interest in and to the land therein described,

subject to the approval of the Secretary of the Interior, to Glenn D. Williams, of Gallup, New Mexico

Said assignment to be effective from date of approval hereof by the Secretary of the Interior.

IN WITNESS WHEREOF, the said assignor have hereunto set their hand and seal, this 26th day of January, 1953.

J. T. Hutton (Seal)
Parallee Hutton (Seal)

(OVER)

ACKNOWLEDGMENT OF CORPORATION

STATE OF .....
COUNTY OF ..... } ss:

Before me, a notary public, in and for said county and State on this ..... day of ....., 19.....
personally appeared .....
to me known to be the identical person who subscribed the name of the maker thereof to the foregoing instrument as its
..... and acknowledged to me that
he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

.....
Notary Public.

My commission expires ....., 19.....

ACKNOWLEDGMENT OF INDIVIDUAL

STATE OF New Mexico
COUNTY OF McKinley } ss:

Before me, a notary public, in and for said county and State, on this 5th day of February, 1953
personally appeared
J. T. Hutton and Parallee Hutton, husband and wife
, to me known to be the identical persons who executed the within and foregoing instrument, and acknowledged to me that they executed the same as their free and voluntary act and deed for the uses and purposes therein set forth.

Gallup
Notary Public.

My commission expires 5-29, 1953

ACCEPTANCE BY ASSIGNEE

The assignee in the above and foregoing assignment, made subject to the approval of the Secretary of the Interior, hereby accepts such assignment and agrees to fulfill all the obligations, conditions, and stipulations in said described indenture of lease, when assigned, and the rules and regulations of the Secretary of the Interior applicable thereto, and to furnish proper bond guaranteeing a faithful compliance with said lease and this agreement.

IN WITNESS WHEREOF, the said assignee has hereunto set his hand and seal this 5th day of February, 1953

[illegible] (Seal)

CONSENT OF SURETY

The ....., of
....., surety for .....
..... on the bond accompanying the lease above described, hereby consents to the assignment and transfer of said lease as above made and agrees that said bond shall remain in force and effect covering obligations of assignee.

Dated at ..... this ..... day of ....., 19.....

UNITED STATES
DEPARTMENT OF THE INTERIOR,

Washington, D. C., DEC 8 1953

APPROVED:
(Sgd) E. L. UTZ
Assistant *Commissioner of Indian Affairs.*

16—11620-6 U. S. GOVERNMENT PRINTING OFFICE

Form 5-154
(October 1939)

CONTINUATION SHEET

Contract No.
I-149-Ind.-9911

MINING LEASE ALLOTTED INDIAN LANDS
(For Minerals other than Oil and Gas)

The Lessee hereby agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, as royalty, the sums of money as follows:

Percentage Royalty Schedule

Mine Value Per Dry Ton	Royalty Percentage of Mine Value Per Dry Ton
$ 0.01 to $ 10.01	10%
$ 10.01 to $ 20.01	11%
$ 20.01 to $ 30.01	12%
$ 30.01 to $ 40.01	13%
$ 40.01 to $ 50.01	14%
$ 50.01 to $ 60.01	15%
$ 60.01 to $ 70.01	16%
$ 70.01 to $ 80.01	17%
$ 80.01 to $ 90.01	18%
$ 90.01 to $100.01	19%
$100.01 or more	20%

"MINE VALUE PER DRY TON", wherever used herein is hereby defined as the dollar value per dry ton of crude ores at the mine as paid for by the Atomic Energy Commission or other government agency before allowance for transportation and development; however, if the government at any time hereafter does not establish and pay for said ores on a fixed or scheduled dollar value per dry ton of crude ores at the mine, or said ores contain saleable minerals, some, or all, of which are disposed of to a custom treatment plant or smelter for treatment and sale, then mine value per dry ton shall be the gross value per dry ton of said crude ore as paid for by the Atomic Energy Commission or other government authorized agency mill or other buyer, less any allowances or reimbursements for the following specific items: (1) transportation of ores; (2) allowances for exploration [illegible], or development of ores; and (3) treatment or beneficiation of ores; which specific items shall in such event be deducted from the gross sales price received from the metal content of said ores by the seller before said percentage royalty is calculated and paid. Such payments shall be made on or before the fifteenth (15th) day of the month next following receipt by Lessee of payment for said ores together with a statement of the mine value of said ores and the amount of royalty due on each lot shipped and sold.

In addition to the above royalty payments there shall be paid to the Superintendent for the use and benefit of the Lessor 10% of any bonus paid by the United States Atomic Energy Commission for the production of ore from the above lease and particularly bonuses for the initial production of uranium ore from said lease. But this provision shall not be limited to bonuses for initial production but shall apply to any and all bonuses paid for the production of ore.

Annual Rental

The Lessee agrees to pay or cause to be paid to the Superintendent for the use and benefit of the Lessor, in advance beginning with the date of approval of the lease as annual rental, the sum of One ($1.00) Dollar per acre for the first calendar year and the sum of One ($1.00) Dollar per acre, in advance, for each and every calendar year thereafter during the continuation of this lease.

The rentals so paid shall not be a credit on the royalties accruing under this lease and shall not be refunded to the Lessee because of any subsequent surrender or cancellation of the lease.

Development

The land described herein shall not be held by the Lessee for speculative purposes but in good faith for mining mineral specified. The Lessee shall expend in the development of said lease in each year the sum of Ten ($10.00) Dollars per acre. Such development shall consist of road building, prospecting or drilling and mining operations, and the Lessee shall each year submit to the Superintendent satisfactory reports regarding development expenditures, which reports shall be furnished within ten (10) days after the yearly anniversary date of the lease; and failure by the Lessee in the diligent development and continued operation of the mine or mines, or the expenditures of the sum provided herein for the development of said lease in each year except when the operations may be interrupted by strikes, the elements or casualties not attributable to the Lessee, shall be held as want of compliance with the purposes of this lease and shall render it subject to cancellation; provided that whenever the Secretary of the Interior shall consider the marketing facilities inadequate or economical conditions unsatisfactory he may authorize the suspension of operations for such time as he may deem advisable but such action will not release the Lessee from the payment of the advance annual rental.

Payment for Surface Damage

The Lessee shall pay to the Superintendent for the use and benefit of the Lessor, as damage to the surface of the lands covered by this lease, Ten ($10.00) Dollars per acre for each acre of land upon which the vegetation of any kind is destroyed or on which the top soil may be removed, turned or damaged by the mining operations conducted on said lease, but not including the reasonable use of the surface for roads and the construction of facilities for the operation of this lease. Provided, however, that in the event the royalty payments made under this lease shall equal or exceed the amount due for surface damages as provided in this paragraph then in that event the Lessee shall be released from the obligation to pay such surface damages.

The Lessee shall not be permitted to surrender or terminate this lease until the damages provided for in this paragraph have been paid and in the event of the cancellation or forfeiture of this lease by the Secretary of the Interior as provided in said lease, the Lessee shall remain obligated to pay for surface damages as herein provided and the bondsmen of the Lessee shall not be released from liability until such surface damages are paid. The extent of the surface damages and the amount due therefor, shall be determined by the Secretary of the Interior.

The lessee shall employ Navajo labor in all positions for which they are qualified, including truck drivers, and shall protect the Indian grazing rights and other Indian rights to the surface of the lands.

The lessee shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and shall require an identical provision to be included in all subcontracts hereunder.

Two witnesses to signature of Lessee

M. D. Long

Lessee

(~~Lessee~~)

Two witnesses to signature of Lessor

M. D. Long

Walter [illegible]

Lessor

Lessor

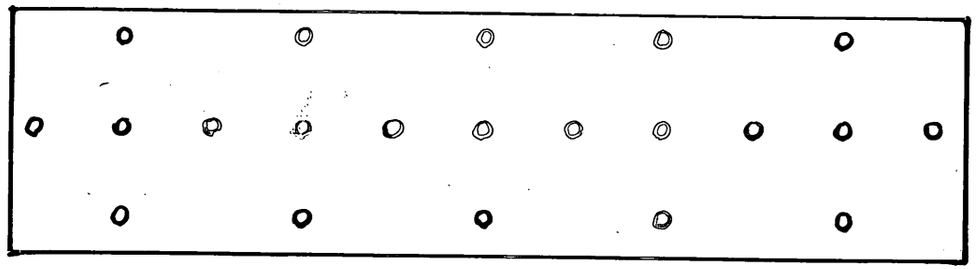
Lessor

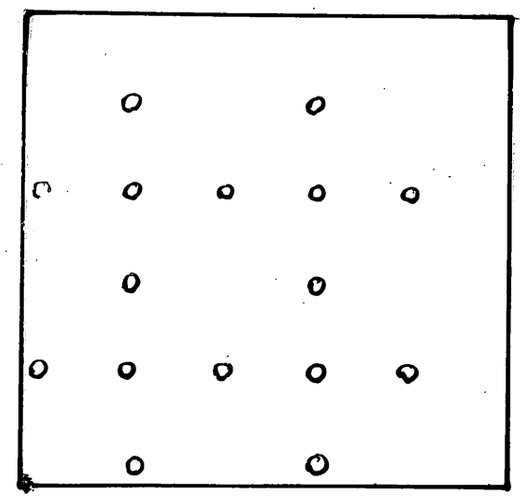
Lessor

Lessor

Lessor

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 1 8 1955





Overlay No 1
Showing Phase 2
Drill holes on 500' Centers

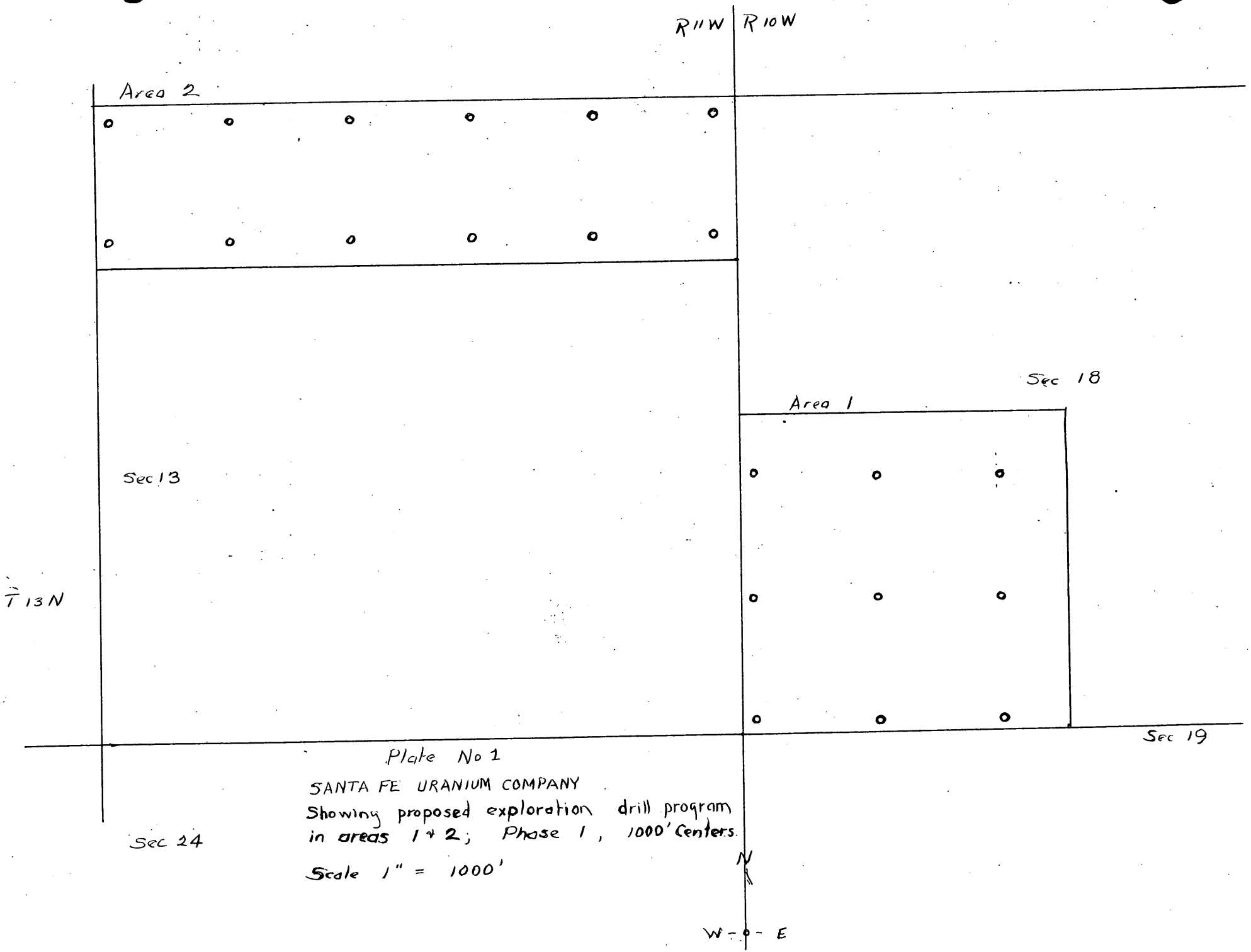
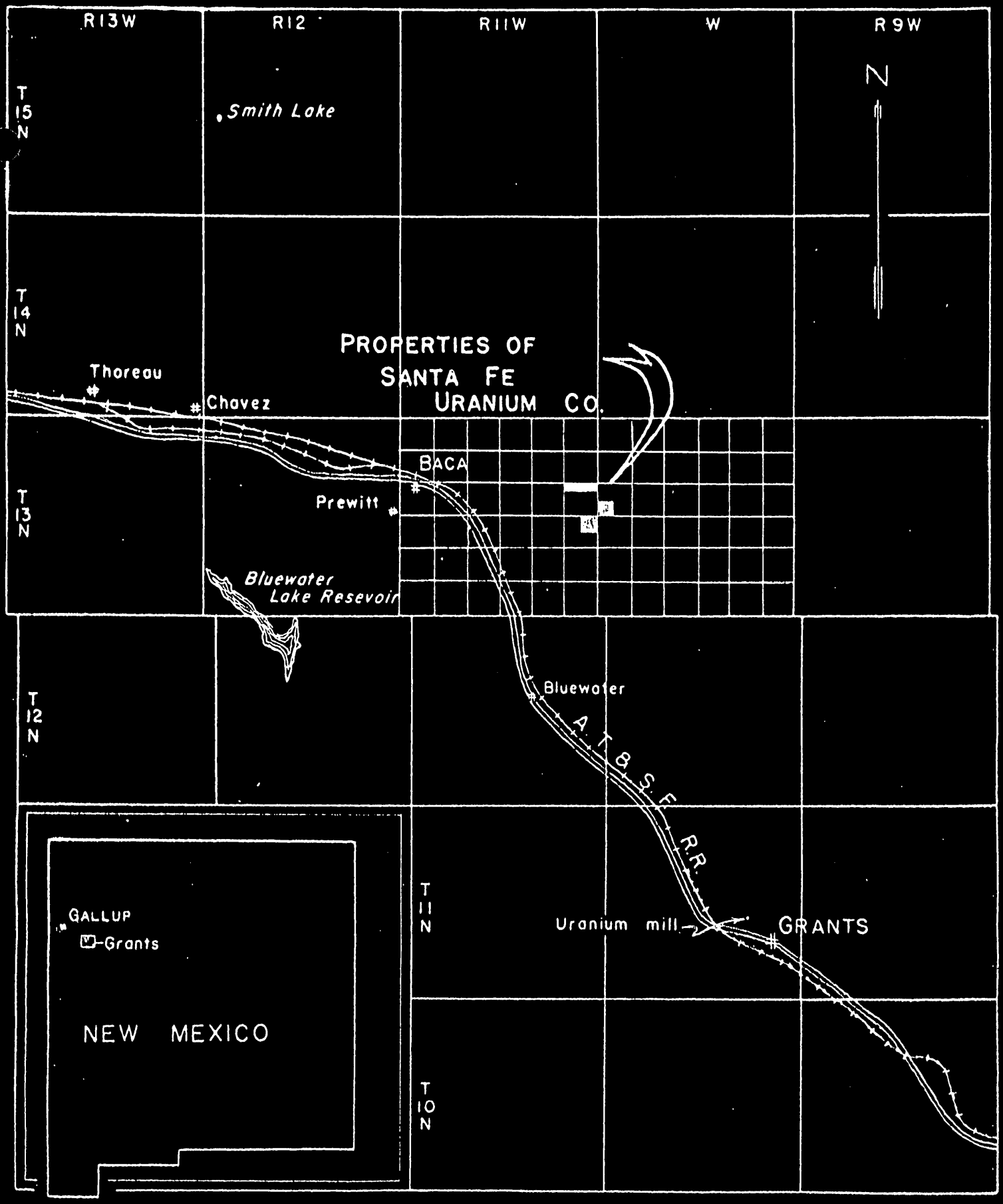


Plate No 1

SANTA FE URANIUM COMPANY

Showing proposed exploration drill program in areas 1 & 2; Phase 1, 1000' Centers.

Scale 1" = 1000'

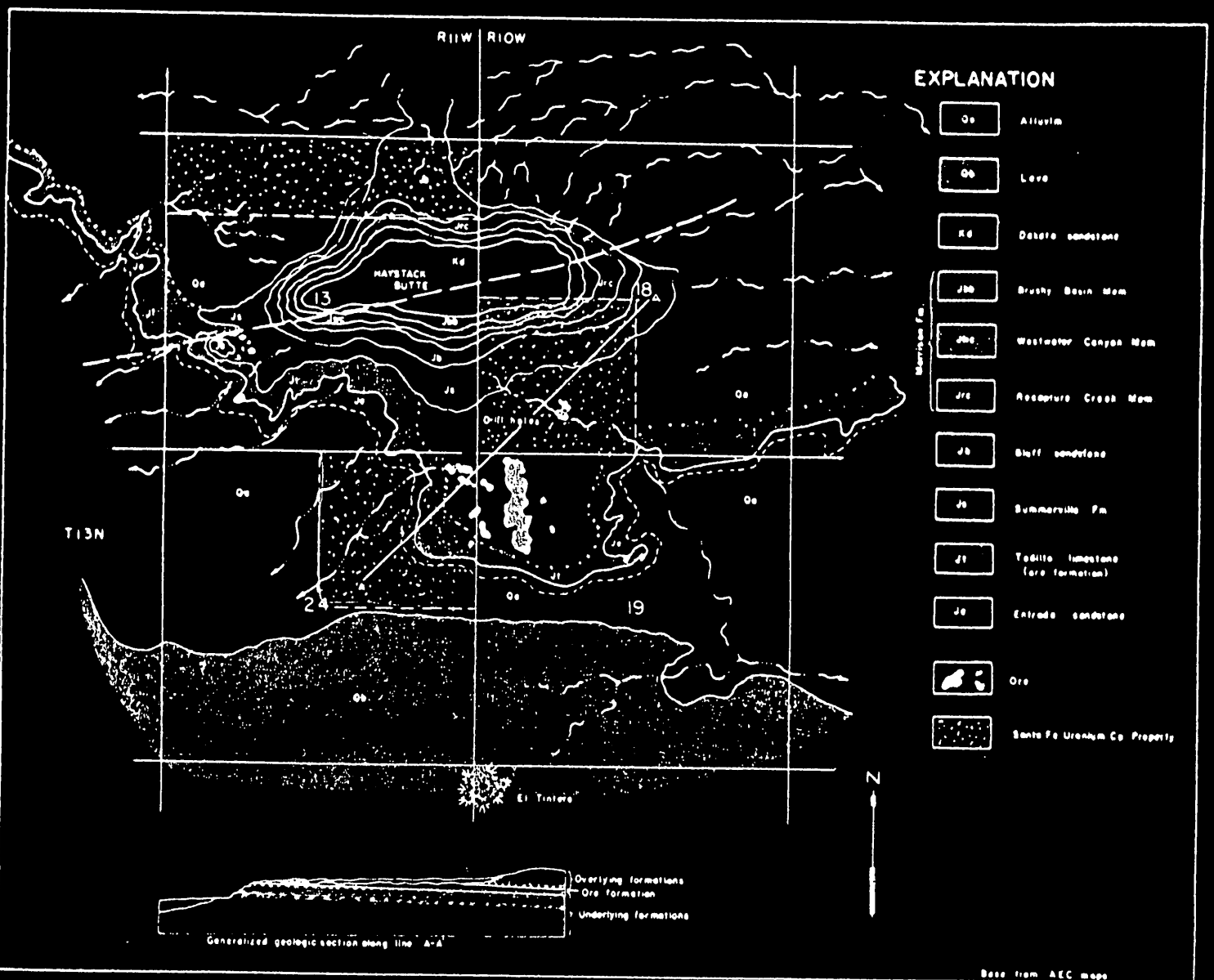


INDEX MAP SHOWING LOCATION
OF THE
SANTA FE URANIUM COMPANY NEW MEXICO

SCALE

1 3/4 1/2 1/4 0 mile

GEOPROFESSIONAL
SERVICES, INC.



GEOLOGIC MAP

of

SANTA FE URANIUM CO. PROPERTIES NEAR GRANTS, N.M.

and adjoining

SCALE

1000 0 1/4 1/2 3/4 mile

GEOPROFESSIONAL SERVICES INC.

1311 WALKER BANK BUILDING, SALT LAKE CITY, UTAH

DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

[redacted]

OFFICIAL BUSINESS

U. S. GEOLOGICAL SURVEY
SOUTH 157 HOWARD ST.
SPOKANE 4, WASHINGTON

SPOKANE
MAR 11
7 PM
1955
WASH.

2

30 CENTS 30
1955
WASH.

~~Mr. George C. Selfridge~~
~~Chairman, Operating Committee~~
Defense Minerals Explor. Admin.
Department of the Interior
Washington 25, D. C.

maps

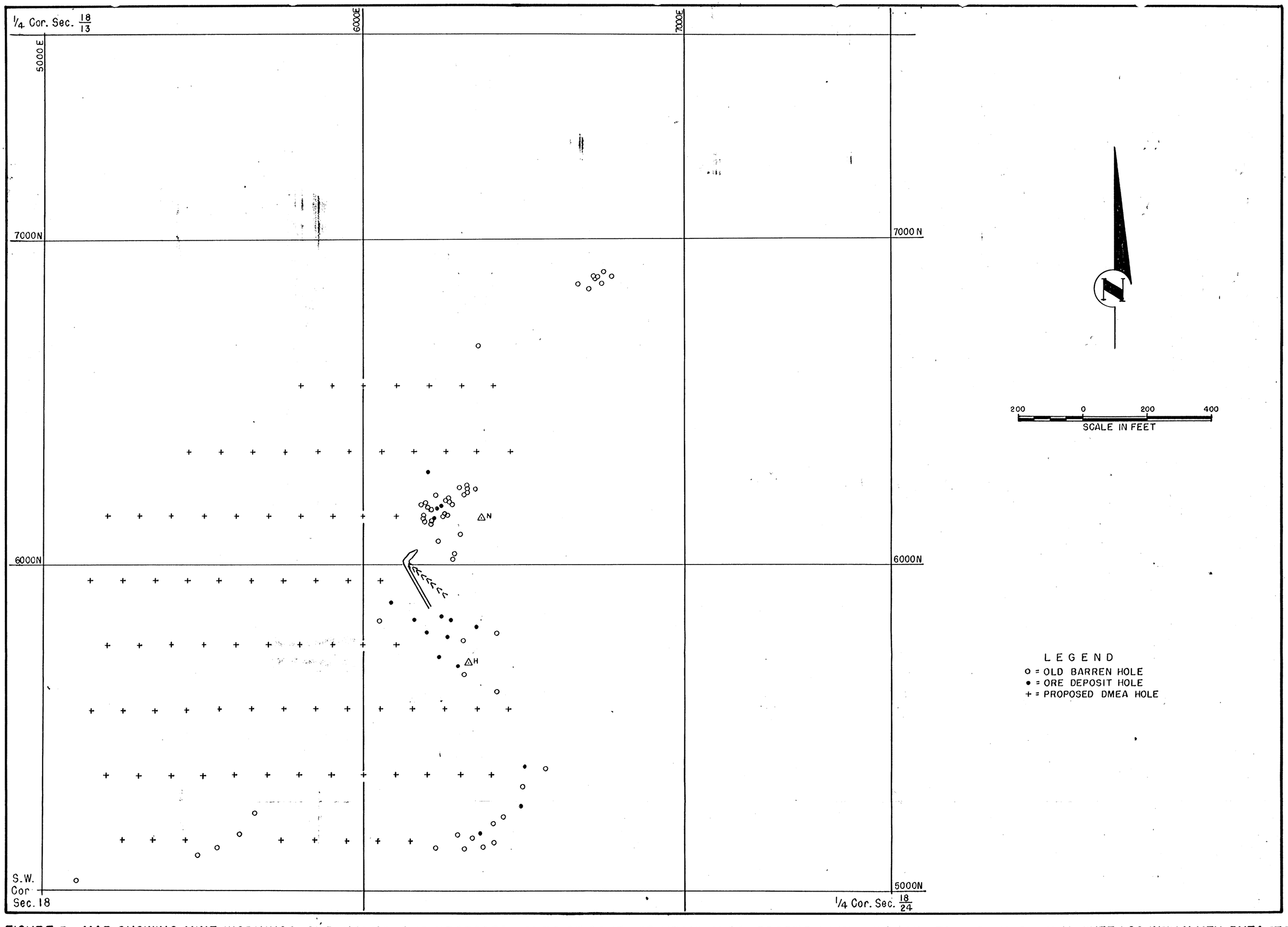


FIGURE 3 - MAP SHOWING MINE WORKINGS, OLD HOLES, AND PROPOSED HOLES OF SANTA FE URANIUM CO., PROPERTY IN S.W. 1/4 OF SEC. 18, T. 13 N., R. 10 W., McKINLEY COUNTY, N. MEX. DMEA 3727