DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE Idm-E NO._____ DMEA NO. 5043

Application
- [ ] Denied
- [ ] Withdrawn

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

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

Folder No. 1:

Left Side

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

Right Side

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

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

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

Additional Folders:

Left Side

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

Right Side

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

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

Folders No._____: Settlement Sheets

Folders No._____: Drill Logs

Folders No._____: Royalty material

17963

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
So. 157 Howard Street
Spokane 4, Washington

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 9 1958

DATE	INITIALS	CODE

June 5, 1958

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: New Application (Thorium)
Sawyer Petroleum Company
T. 10 S., R. 15 W., P. M.
Lemhi Pass District
Beaverhead County, Montana

Dear Mr. Selfridge:

Enclosed are the original and two copies of an application for DMEA aid to explore for thorium in Beaverhead County, Montana. The property includes the claims explored under the terms of Contract Idm-E144, Docket No. DMEA-1168X, but the area of proposed exploration is farther west. (1184)

The applicant proposes to explore in two stages by bulldozing, crosscutting, drifting, and underground diamond drilling at an estimated total cost of $200,000.

Only two copies of a letter dated January 20, 1958, from Sawyer Petroleum Company to the Republic National Bank of Texas, were received with the application. We are retaining one copy for our files.

A field examination will be scheduled for the week of June 9, 1958.

Sincerely yours,

A. E. Weissenborn

A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I

Enclosures

cc: USBM (2)
Prinz

Please address all correspondence to the Los Angeles Office.

June 2, 1958

ORIGINAL FILE COPY
DMEA
JUN 9 1958

Mr. A. E. Weissenborn
Executive Officer
D. M. E. A. Field
U.S. Geological Survey
157 South Howard
Spokane, Washington

Dear Mr. Weissenborn:

I am forwarding under separate cover, via Air Express, an original and three (3) copies of an application for a D.M.E.A. loan on the Sawyer Petroleum Company Thorium property in Beaverhead County, Montana.

It is hoped that the application is complete and that it will receive your favorable consideration.

Sincerely yours,

SAWYER PETROLEUM COMPANY

E. W. Sawyer, Jr.
President

RECEIVED
JUN 4 1958
U. S. G. S.
SPOKANE, WASH.

EWS:mr

Form MF-103
Revised Oct. 1957

UNITED STATES
DEPARTMENT OF THE INTERIOR

DMEA

Budget Bureau No. 42-R1035.3
Approval expires June 30, 1958

DEFENSE MINERALS EXPLORATION ADMINISTRATION

APPLICATION FOR AID IN AN EXPLORATION PROJECT

PURSUANT TO DMEA ORDER I, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

NAME OF APPLICANT (Full legal name and mailing address as it should appear on contract if one is executed)

Sawyer Petroleum Company
Oatman, Arizona

address

RECEIVED
JUN 4 1958
U. S. G. S.
SPOKANE, WASH.

APPLICANT NOT TO USE THIS BLOCK

Docket Number: DMEA-5043
Date Received: 6-9-58
Government Participation %:
Region: I
Division Code: 700

BUSINESS ORGANIZATION (Check one)

- Individual [ ]
- Corporation [X]
- Partnership [ ]
- Other (Specify) [ ]

State in which firm is organized: Arizona

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

Name	Address	Title
E. W. Sawyer, Jr.	650 S. Grand Ave., Los Angeles, Cal.	President
J. A. Sawyer	650 S. Grand Ave., Los Angeles, Cal.	Vice-Pres.
R. D. Sawyer	650 S. Grand Ave., Los Angeles, Cal.	Vice-Pres.
E. W. Sawyer, Sr.	650 S. Grand Ave., Los Angeles, Cal.	Asst. Sec.
Carl W. Faucett	650 S. Grand Ave., Los Angeles, Cal.	Secretary

Mineral(s) for which you wish to explore: Thorium

Estimated Cost of Project: $ 200,000.00

LOCATION OF PROPERTY

Name	County	State
T.10S., R.15W., P.M. Lemhi Pass District	Beaverhead	Montana

GENERAL INSTRUCTIONS

Before filling out this application, please read DMEA Order-I, Revised, "Government Aid in Defense Exploration Projects." To assure prompt action, your application must provide all applicable material and information specified on the back of this application form. Avoid unnecessary correspondence and delays by submitting complete and accurate information. *Please submit four copies of this application and all accompanying papers* except as otherwise noted. Place your name and address on each sheet. Each item of information, maps, and reports required as a part of this application is described on the back of this form. Identify each attached statement by the item number to which it applies. If an item does not apply to your application, show the item number on your statement and after it write "not applicable." Maps or sketches should be used to supplement narrative descriptions of the property location and boundaries in item 1, existing mine workings and geology in item 2, and the proposed exploration project in item 4. When this information is not too complex, all of it may be shown on one map or sketch. All documents and other attachments submitted as a part of this application, except those in item 2(g) which you mark to be returned, become the property of the Government and will not be returned to the applicant. Send true copies, *not originals,* of leases, contracts, and other documents which are an essential part of your business records. *File this application with the Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest DMEA Field Office.*

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.

May 5, 1958
Dated

E. W. Sawyer
BY (Signature)

President
Title

A wilfully false statement or certification to any Department or Agency of the United States Government is a criminal offense. U. S. Code, Title 18, Sec. 1001.

INFORMATION REQUIRED WITH THIS APPLICATION

1. *Applicant's Property Rights:*

(a) State the legal description (section, township, and range; metes and bounds; patent number of claims) of the land upon which you wish to explore, and all land adjacent to the proposed project area which you own or control. Describe any part of the project land or workings which should not be subject to Government lien for royalty payments. If the land consists of unpatented claims, state the book and page number for each recorded location notice, including amended locations, and the place where recorded (courthouse, recorder's office, county, and state).

(b) State all the names by which you know the property.

(c) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise. If you are not the owner, submit with this application one exact copy of the lease, contract, or other document (with address of owner) under which you control the property.

(d) Describe all liens, mortgages, or other encumbrances on the property.

2. *Physical Description:*

(a) Describe in detail and illustrate with maps or sketches all mining or exploration operations which you know have been or are being conducted upon the lands, including existing mine workings. Describe all production facilities.

(b) State your interest, if any, in operations stated in 2*(a)*.

(c) State, as far as you know, the past and current production, supporting your statement with copies of settlement sheets, mine records, or published data if available.

(d) Describe known ore reserves on the property giving quantities and grades and sampling methods used, supporting your statement with copies of assay certificates and assay maps if available.

(e) Describe by narrative and maps or sketches the geologic features of the property, including ore minerals, geologic formations if known, and type of deposit (vein, bedded, etc.).

(f) State your reasons for expecting to find ore, and if you have sampled the area you propose to explore, show where the samples were taken, describe sampling methods used, and provide copies of assay certificates.

(g) Send with your application at least *two* copies of all geologic, or engineering reports, assay maps, or technologic information which you may have, indicating on each whether you require its return to you.

3. *Accessibility of Project:*

(a) To aid DMEA representatives who may be required to examine the property, state the name and address of the person who will meet the DMEA representative; give directions for reaching the property; and describe accessibility of the property including the mine workings.

(b) Name the shipping and supply points and places where employees reside and state the distances between them and the property.

4. *The Exploration Project:*

(a) Describe fully the proposed exploration project giving individual footages and sizes of openings *for each item of work.* Use narrative, maps, plans, and longitudinal and cross sections as necessary. Show the location of the proposed work as related to geologic features such as veins, ore-bearing beds, contacts of rock formations, etc. Show also the relation of the proposed work to any existing mine workings and to *property boundaries* or to the closest identifiable corner.

(b) If an access road to the project must be built, show the location on the property map and state the length, type, and construction methods proposed.

(c) In the event that an exploration contract with DMEA is executed, how soon will the work start and how many months will be required to complete it? State your anticipated average daily or monthly rate of progress for each type of work.

5. *Experience:*

State your operating experience and background with relation to your ability to carry out this exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of Costs:*

Furnish detailed estimates of the costs *for each item of the work proposed in 4(a)* under the headings listed below with a total for each heading and the estimated total cost of the project. Costs for any work to be performed by an independent contractor should be shown separately under category *(a)* below. Costs for any work that is not to be performed by an independent contractor should be given in detail under categories *(b)* through *(g)*.

(a) Independent contracts. State the cost of any proposed independent contract for the performance of all or any part of the work, expressed in units of work, such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved. Cost estimates should be supported by bids from three contractors if possible. *(Note* – If none of the work is to be contracted, write "none" after this item.)

(b) Personal services. For necessary supervision, engineering and geological services, and labor, include an itemized schedule of numbers, classes, rates of wages, salaries or fees, and periods of employment. State whether these technicians and employees are available.

(c) Operating materials and supplies. List items of material and supplies with their cost. Include under this heading power, water, and fuel, and units of equipment and tools costing less than $50 each.

(d) Operating equipment. List items of operating equipment to be used giving specifications and indicating how each item is to be acquired – i.e., rented, purchased, or provided by the applicant. If it is rented or purchased, state the estimated rental or purchase price. If it is to be furnished by the applicant, give its present fair market value.

(e) Initial rehabilitation and repairs. Describe the type and the cost of necessary *initial* rehabilitation or repair of existing buildings, fixtures, installations (exclusive of mine workings), and movable operating equipment now owned by the applicant, which will be used on the exploration project.

(f) New buildings, fixtures, installations. Describe each building, fixed improvement, and installation to be purchased, constructed, or installed for the exploration project stating specifications and cost including labor, materials and supervision.

(g) Miscellaneous. For the operating equipment listed in 6*(d)*, describe the type and estimate the cost of repairs and maintenance expected during project operations. Do not repeat initial repairs listed in 6*(e)*. Show also the costs of analytical work, accounting, workmen's compensation and employees' liability insurance, payroll taxes, and other required costs that do not fall within the previous categories.

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)* State whether you are prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation stated in Sec. 7 of DMEA Order–I, Revised.

(b) Explain to what extent you propose to furnish your share of the costs by providing money, by use of equipment owned by you, or otherwise.

* * * * *

INT.-DUP. SEC., WASH., D.C. 25960

Only 2 copies rec'd
To DMEA
1 for Requesting & file

RECEIVED
JUN 4 1958
U. S. G. S.
SPOKANE, WASH.

C
O
P
Y

SAWYER PETROLEUM COMPANY
Oatman, Arizona

Petroleum and Mineral Exploration

Los Angeles Office
650 So. Grand Ave.,
Los Angeles 17, Calif.

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 9 1958

DATE	INITIALS	COPY

January 20, 1958

Republic National Bank of Texas
Pacific and Ervay
Dallas, Texas

Attention: Mr. Dewitt Ray

Re: Ragand Minerals Co., Inc.

Gentlemen:

We hand you herewith the following instruments, under conditions whereby this letter shall constitute escrow instructions relative to the acquisition by the undersigned, Sawyer Petroleum Company, an Arizona corporation, hereafter for convenience referred to as "Sawyer", of all the assets of Ragand Minerals Co., Inc., a Delaware corporation, hereafter for convenience referred to as "Ragand", it being understood and agreed by the parties hereto that the confirmation and execution of these escrow instructions by Sawyer and Ragand shall constitute, in accordance with the terms herein set forth, a binding contractional obligation on the part of Ragand to take all necessary steps and to transfer said assets and on the part of Sawyer to receive said assets:

A. Triplicate copies of the herein letter.

B. Certified copy of resolution of Sawyer authorizing Sawyer to enter into and consumate this transaction.

C. Form of royalty deed to be executed by Ragand granting to George N. George, for services rendered, a 3% royalty with respect to said assets of Ragand, it being understood and agreed that Sawyer hereby consents to receive said assets subject to said royalty and that Ragand will take, prior to execution, such legal steps as may be necessary in the States of Texas and Montana to obtain approval of the issuance of said royalty.

D. Form of deed to be executed by Ragand.

E. Form of Bill of Sale to be executed by Ragand with respect to inventory of equipment, buildings and other personal property owned by Ragand, hereinafter for convenience referred to as "said equipment".

F. Form of Warranty of Title to be executed by George N. George.

G. Certificate of Ragand that it has no debts other than disclosed in these escrow instructions, secured by all property transferred by it through the herein escrow,

and Sawyer will hereafter hand you, when this herein letter and escrow instructions have been executed by Ragand and by C. Andrade,III, and a fully executed copy of same has been received by Sawyer, together with Ragand's corporate minute book for examination by Sawyer and a certified copy of the resolution of the Board of Directors of Ragand authorizing the herein transaction:

(a) The sum of Twenty-Five Thousand Dollars ($25,000.00) and

(b) Sawyer's written approval of a licensed mineral surveyor selected by Ragand to do the survey work hereinafter specified, it being understood that Sawyer will approve of any State or Federal licensed surveyor, and

(c) Six Hundred Thousand (600,000) shares of stock of Sawyer, it being understood and agreed that any and all stock of Sawyer acquired by Ragand pursuant to this agreement shall be held by Ragand for investment purposes under S.E.C. regulations, said stock to become the property if Ragand only in the event this escrow closes as herein prescribed,

each of which items, other than said Twenty-Five Thousand Dollars ($25,000.00) which will be disbursed as set forth in paragraph (ii) page six hereof, you may use for the purposes hereinafter set forth when, and only when, you shall have received from Ragand, at Ragand's expense, (except that Sawyer will at its expense pay one-half (1/2) of the surveyor's professional fee for the surveying herein set forth in paragraph I hereof) and for unconditional delivery to Sawyer,each of the following items, save and except as any one or more of the same may be hereafter waived by Sawyer's written instruction delivered to you:

I. A properly drafted and certified survey prepared by a licensed mineral surveyor selected by Ragand and so approved by Sawyer, covering the lands set forth on Exhibits "A" and "B" attached hereto and by this reference made a part hereof,hereinafter for convenience referred to as "said lands", and consisting of first a map showing the location of each of the mining claims located on Exhibits "A" and "B", and secondly a memorandum setting forth a full and complete metes and bounds description of each of said claims and of any areas lying between said claims where one or more of the same may not be contiguous, said survey to be so conducted as to fulfill the

following conditions:

(i) Proper relation of discovery work to lovation of claim,

(ii) End lines to be parallel,

(iii) Claim size to be not greater than 1500 feet by 600 feet,

(iv) Claims to be contiguous,

(v) Each claim to have done thereon the full legal discovery work,

(vi) Claims to comply with all pertinent Montana and Federal statutes,

provided, however, that if Frying Pan No. 2 is not now contiguous to any claim set forth in Exhibits "A" and "B" and cannot be made so, Sawyer agrees to waive said condition (iv) as to said Frying Pan No. 2, with any such waiver in no way being deemed or construed as a waiver of said condition as to any other claim or claims; and thirdly, an individual plat of each of said claims setting forth thereon the metes and bounds description thereof and properly identifying the natural object relating thereto, and properly tying each said claim to U. S. Geodetic Survey Bench Marks or properly placed iron posts presently on said lands marking section corners. After the survey herein referred to is completed, Ragand shall have the right to correct or amend the description of any claim at any time prior to September 1, 1958, or the close of this escrow, whichever shall first occur.

II. Recorded originals of Amended Certificates or Location, when necessary, with respect to each of the claims set forth on Exhibits "A", each of said certificates to describe the claim covered thereby in accordance with said survey and the conditions enumerated in paragraph I above, including a description of the full legal discovery work done thereon.

III. Recorded originals of Certificates of Location of new claims covering any areas between said claims set forth on Exhibit "A" where the same may not be found by said survey to be contiguous, each of said certificates to describe the claim covered thereby in accordance with said survey and the conditions enumerated in paragraph I above, including a description of the full legal discovery work done thereon.

IV. Recorded originals of Proof of Annual Labor for each of said claims since original Certificate of Location of each, provided any such Proof of Annual Labor may cover one or a group of claims.

V. Recorded original Quitclaim Deed of Leonard Kessel in favor of Ragand with respect to Last Chance Quartz Lode Mining Claim and Brown Bear Lode Mining Claim, which instrument Sawyer represents has been located and will be furnished.

VI. Recorded original Quitclaim Deed of Dave Wellborn and spouse, if any, in favor of Ragand with respect to The Shady Tree Claim and the Brown Bear Lode Mining Claim.

VII. Recorded original Quitclaim Deeds of spouses of Ned Wellborn and Billy Wellborn in favor of Ragand as to said lands.

VIII. Recorded original Quitclaim Deed of spouse of C. Andrade, III in favor of Ragand as to said lands.

IX. Recorded original Quitclaim Deed of R.A.Wellborn in favor of Ragand,dated July 25, 1957,covering those certain lode mining claims known as Ragand Lode Mining Claim and Ragand Lode Mining Claims 1, 2, 3, 4, 6, 8, 9, 10, 11, 12 and 13.

X. Recorded original Quitclaim Deed executed by C.J.A. Price, President, on behalf of Elkhorn Mining Co. (under date of March 24,1954) in favor of R. A. Wellborn, Billy Wellborn, Ned Wellborn, Darrel Peterson, Leonard Kessell, Dave Wellborn covering the Last Chance Quartz Lode Mining Claim, The Shady Tree Mining Claim and The Brown Bear Lode Mining Claim, which instrument Sawyer represents has been located and will be furnished.

XI. Statement of Southern Montana Abstract and Title Company that its certain Abstract covering portions of said lands dated July 23, 1957 had only 107 pages when originally prepared.

XII. Southern Montana Abstract and Title Company Abstract covering said property dated not more than one week prior to the close of escrow,which,for the purpose of these instructions, shall be deemed to mean the date upon which the final payment of funds deposited herein by Sawyer for Ragand is disbursed by you to Ragand and upon which all documents delivered herein for Sawyer are delivered to Sawyer, said Abstract to cover specifically all legal proceedings and judgments of record against any person referred to in these escrow instructions.

E.W.S.Jr.

C.W.F.

XIII. Sawyer's written acknowledgement of Receipt of Possession of said lands and said equipment confirmed in writing by Ragand,it being understood between the parties hereto that Sawyer may have possession at its request at any time after the date hereof, but Sawyer shall take possession not later than May 1, 1958. Sawyer agrees that it will do all the annual labor assessment work and file the necessary Annual Proof of Labor due June 30, 1958 with respect to all of said lands, on or before June 1, 1958 and will send notice of filing of said Annual Proof of Labor to Ragand. Sawyer further agrees that after taking possession of said lands as herein set forth it will keep the claims in effect pending the final consummation of this contract, and Sawyer further agrees that afterit takes possession of said lands as aforesaid, that it will be responsible for any loss of said equipment and for workmen's compensation, public liability and property damage with respect to said lands, and Sawyer agrees to save harmless and indemnify Ragand against these same.

XIV. Beaverhead County Property Tax Receipt for 1957 covering said equipment.

XV. Certificate of Title properly endorsed in favor of Sawyer on the two jeep trucks listed on said Bill of Sale, accompanied endorsements transferring to Sawyer any insurance on said vehicles.

XVI. Deed described in paragraph D fully executed by Ragand.

XVII. Bill of Sale described in paragraph E fully executed by Ragand.

XVIII. Form of Warranty of Title described in paragraph F fully executed.

XIX. Such arrangement as you may require for the payment of your fees and the cost of the herein escrow, provided Sawyer hereby agrees to pay one-half (1/2) of your fees and the cost of the herein escrow.

XX. Recorded original of deed or deeds from Wellborn conveying said lands to C. Andrade,LLL,hereinafter for convenience referred to as "Andrade", and recorded original deed or deeds from Andrade conveying said lands to Ragand.

it being mutually understood and agreed by Sawyer and Ragand as follows:

(i) Compliance with each and all of the foregoing items, I through XX which pertain to said lands will satisfy Sawyer's objections to title as shown by said Abstract of Title dated July 23, 1957 and consisting of only 107 pages.

(ii) That uou, as escrow holder, will disburse to Ragand, when you have received these escrow instructions executed by Ragand and C. Andrade,III, the Twenty-five Thousand Dollars ($25,000.00) payment made into escrow by Sawyer as set forth in paragraph (a) hereinabove as soon as the same shall have been received by you, but each and every further item deposited in escrow by Sawyer shall be held by you in escrow and not delivered to Ragand (~~until-all the-conditions-herein-set-forth-to-be-performed-by-Ragand have-been-completed-by-Ragand-(or-waived-by-Sawyer-as provided-hereinabove)-and-~~) until said escrow is ready to be closed.

R. D. &
E. W. S. Jr.

(iii) That Sawyer, in order to carry out the payments due Wellborn, will, on or before April 1, 1958,pay to State Bank & Trust Company of Dillon, Montana , on behalf of R. A. Wellborn,Mattie Wellborn,Billy Wellborn and Ned Wellborn, hereinafter collectively for convenience referred to as "Wellborn", the sum of Fifteen Thousand Dollars ($15,000.00), and under like terms and conditions the further sum, on or before October 1, 1958, of Fifteen Thousand Dollars ($15,000.00), and under like terms and conditions the further sum,on or before April 1,1959,of Fifteen Thousand Dollars ($15,000.00) and in order to give Ragand necessary notice Sawyer will,thirty (30) days prior to each such date,notify Ragand in writing of Sawyer's intention to make the required payment,provided,however, that Ragand and C. Andrade,III,each by the signature of each affixed hereto, personally agree to repay to Sawyer any sums paid by Sawyer to Wellborn or any sums paid out of escrow by Republic National Bank of Dallas in the event the title to any portion of said lands set forth on Exhibit "A" shall, during the period of this escrow, be found to be defective. It is understood that Ragand's and Andrade's agreement to repay ceases after title has been accepted by Sawyer.

(iv) That Ragand will, until Sawyer takes possession of said lands, be responsible for any loss of said equipment and for Workmen's Compensation, public liability and property damage with respect to said lands and Ragand agrees to save harmless and indemnify Sawyer agains the same.

E.W.S.Jr.
C.W.F

(v) That Ragand will execute such instruments as may assist Sawyer in obtaining Atomic Energy Commission licensing and a Defense Minerals Emergency Administration loan for exploration or development of said lands; provided, that such instruments shall be merely formal instruments and shall not in any manner involve Ragand or its stockholders financially, and, provided further, that Ragand shall have the right of approval of such instruments before being executed.

(vi) Ragand shall have until July 15, 1958, within which to complete the steps set forth in the conditions designated in Paragraphs I through XX of these escrow instructions. Sawyer, however, shall deposit on or before May 15, 1958, in escrow the following:

(aa) Fifty-Eight Thousand Dollars ($58,000.00) in cash, to be paid at the close of escrow to Andrade and Raigorodsky in full liquidation of all of the liabilities of Ragand, including both notes payable and accounts payable.

provided, however, said Fifty-Eight Thousand Dollars ($58,000.00) shall be deposited in escrow not later than May 15, 1958, notwithstanding the fact that the steps to be performed by Ragand as set forth in Paragraphs I through III of the herein escrow instructions may not have been completed.

(vii) That until such time as Sawyer shall have made available for use with respect to the ore produced from said lands, a mill capable of processing one hundred (100) tons of raw ore each day and shall have commenced operations of said mill, Sawyer shall not increase its authorized capital stock to an amount exceeding Five Million (5,000,000) shares without the written consent of Ragand or Andrade, provided, however, anything to the contrary herein notwithstanding that said restriction shall not apply to any other form of financing selected by Sawyer other than its issuance of its said capital stock, and said restriction shall not last for a period longer than eighteen (18) months from the date hereof; provided further that Sawyer agrees to actually start the construction of the one hundred (100) ton plant on or before September 1, 1958.

(viii) That in the event Sawyer shall fail to give the notice required under paragraph (111) hereof or shall fail to make any required payment, then the rights of Sawyer hereunder to said lands shall be forfeited, and the obligations of the parties hereto shall be terminated, and any moneys paid by Sawyer shall be forfeited, including any moneys expended by it for assessment work.

E.W.S.Jr.

(ix) That each of the parties will execute such instruments as may be necessary to carry out the purposes hereof.

C.W.F.

[illegible] national bank of [illegible]
January 23, 1958
page [illegible]

(v) [illegible] will encourage open [illegible] to [illegible] [illegible] obtaining electric energy generation licensing [illegible] a [illegible] [illegible] [illegible] [illegible] or development of said lands; provided, [illegible] such [illegible] shall be merely formal [illegible] and shall not [illegible] any [illegible] [illegible] or in [illegible] [illegible] [illegible], provided however, that [illegible] [illegible] the right or approval of such [illegible] [illegible] [illegible].

(vi) [illegible] will have [illegible] January 15, 1958, [illegible] [illegible] example [illegible] the [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible]

and you are hereby instructed:

1. To close the herein escrow as soon as Sawyer shall have approved in writing documents supplied pursuant to paragraphs I through III hereof and as soon as all of the conditions (a) through (c), I through XX, and (vi) have been complied with, or waived by Sawyer.

2. At the close of escrow to deliver all of the moneys, stock and instruments herein set forth, other than the Twenty-Five Thousand Dollars ($25,000.00) theretofore disbursed, to the parties entitled thereto.

3. In the event you are not able to close the herein escrow as aforesaid for any reason whatsoever on or before the expiration of eight (8) months from the date hereof, then the items deposited herein by each of the parties hereto shall be returned to the party depositing the same, upon written instructions therefor by Sawyer and Ragand, subject, however, to payment of all charges and expenses incurred by you in connection with this escrow, and subject to the provisions of paragraph (viii).

4. In consideration of your acting as escrow holder herein, it is agreed that you shall in no case or event be liable for the failure of any of the conditions of this escrow or damage caused by the exercise of your discretion in any particular manner, or for any other reason, except gross negligence or willful misconduct with reference to the said escrow, and you shall not be liable or responsible for your failure to ascertain the terms or conditions, or to comply with any of the provisions of, any agreement, contract, or other document filed herewith or referred to herein, nor shall you be liable or responsible for forgeries or false personation.

SAWYER PETROLEUM COMPANY

By E. W. Sawyer, Jr.,
President

By Carl W. Faucett
Secretary

(S E A L)

SAWYER

(Sawyer Petroleum Company
Incorporated
Dec. 1906

Arizona)

The foregoing instructions are hereby approved and agreed to by the undersigned, and Ragand will hand you such funds and papers as may be required to complete the herein escrow, all of which you are instructed to use in order to comply with the foregoing.

RAGAND MINERALS CO., INC.,

By_____
President

(SEAL)

By_____
Secretary

RAGAND

_____
C. Andrade, III

ANDRADE

Receipt of the foregoing instructions and instruments is hereby acknowledged this 27 day of February, 1958, by the undersigned escrow holder.

REPUBLIC NATIONAL BANK OF TEXAS

By_____

Last Chance Quartz Lode Mining Claim
Last Chance No. 1 Quartz Lode Mining Claim
Last Chance No. 2 Quartz Lode Mining Claim
Last Chance No. 3 Quartz Lode Mining Claim
Last Chance No. 4 Quartz Lode Mining Claim
Last Chance No. 5 Lode Mining Claim
Last Chance No.25 Lode Mining Claim
Last Chance No.26 Lode Mining Claim
Last Chance No.27 Lode Mining Claim
Last Chance No.29 Lode Mining Claim
Last Chance No.30 Lode Mining Claim
Last Chance No.31 Lode Mining Claim
Last Chance No.32 Lode Mining Claim
Last Chance No.33 Lode Mining Claim
Last Chance No.34 Lode Mining Claim
Last Chance No.36 Lode Mining Claim
Last Chance No.37 Lode Mining Claim
Last Chance No.38 Lode Mining Claim
Last Chance No.39 Lode Mining Claim
Last Chance No.39 A Lode Mining Claim (Fraction)
Last Chance No.40 Lode Mining Claim
Last Chance No.41 Lode Mining Claim
Last Chance No.42 Lode Mining Claim
Last Chance A Lode Mining Claim
Last Chance B Lode Mining Claim
Last Chance C Lode Mining Claim
Last Chance D Lode Mining Claim
Last Chance E Lode Mining Claim
Last Chance F Lode Mining Claim
Last Chance G Lode Mining Claim
Last Chance H Lode Mining Claim
Last Chance I Lode Mining Claim
Last Chance J Lode Mining Claim
Frying Pan
Frying Pan No. 2
The Shady Tree
The Brown Bear Lode

Exhibit "A"

Ragand Lode Mining Claim
Ragand 1 Lode Mining Claim
Ragand 2 Lode Mining Claim
Ragand 3 Lode Mining Claim
Ragand 4 Lode Mining Claim
Ragand 6 Lode Mining Claim
Ragand 8 Lode Mining Claim
Ragand 9 Lode Mining Claim
Ragand 10 Lode Mining Claim
Ragand 11 Lode Mining Claim
Ragand 12 Lode Mining Claim
Ragand 13 Lode Mining Claim
David Tunnel Site
Last Chance Tunnel Site

51 claims listed above

34 shown on map (Exhibit A) and listed above.

13 claims shown on Exhibit A but not listed above.

mc

Exhibit "B"

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APPLICATION FOR DMEA EXPLORATION LOAN

SAWYER PETROLEUM CORPORATION

1. Applicants Property Rights:

a. The land considered under this proposed Government participation exploration contract, commonly called DMEA contract, all lies within the confines of Beaverhead County, Montana. It is further and more accurately located in sections 20, 28, and 29 of Township 10 South, Range 15 West, Montana Principal Meridian. The property includes 44 unpatented lode mining claims in an area approximately two miles in an east-west direction by one and one-half miles north and south. The claims are bounded on the north by the Montana-Idaho border. The claims are duly recorded in the office of County Clerk and Recorder, Dillon, Montana, and are so entered in Book 108, pages 237, 259, 285, 367, and 551 to 558; Book 129, pages 571 to 595; Book 140, pages 5, 10, 15 to 20, 333, 337 to 341 and 345 to 371; and in Book 145, pages 509 to 513, 115 to 117 and 519 to 547. The claims have all been surveyed and are shown on the map labeled Exhibit A. The firm of Hammond and Everly Engineering Company of Butte, Montana are presently engaged in a resurvey of the property in order that the Sawyer Petroleum Company may be assured of the accuracy of such survey. This map is now being prepared.

b. The following names known in the district all apply to the same above described property:

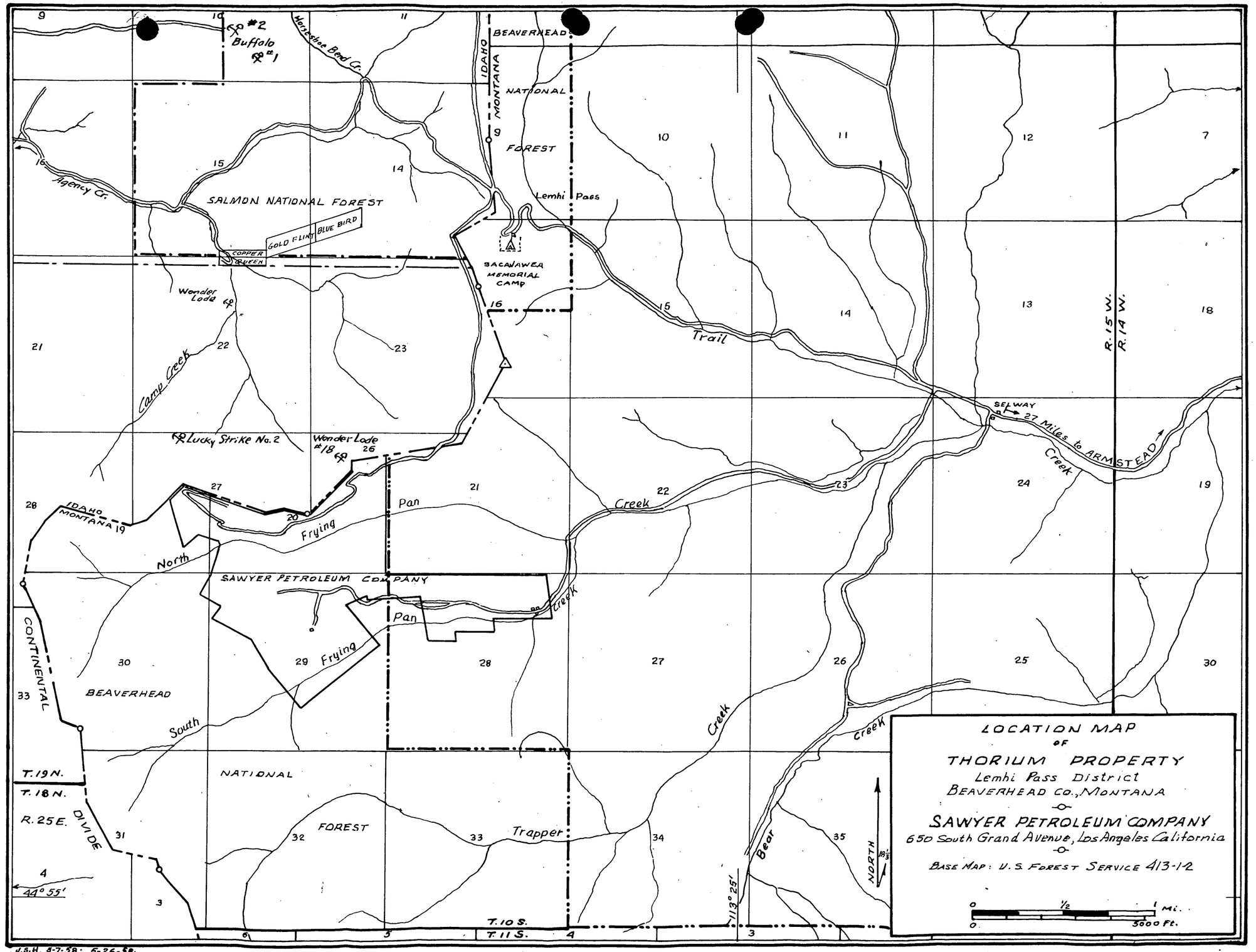
1. Wellborn Claims
2. Selways
3. Thorium Metals
4. Sawyer Petroleum Property

c. The applicants control the property by reason of certain agreements to purchase as set forth in the attached exhibits. The applicants have met all current requirements for purchase and are now on location at the property and have begun work intended to bring the property into production so that any requirements or intentions of good faith are being adhered to.

To the best of the applicants knowledge, there are no liens, mortgages or other encumbrances on the property other than those that are clearly stated in the attached exhibits.

2. Physical Description:

a. Mining and/or exploration workings now existing on the property consist of the following described types and amounts of work.


LOCATION MAP
OF
THORIUM PROPERTY
Lemhi Pass District
BEAVERHEAD CO., MONTANA
SAWYER PETROLEUM COMPANY
650 South Grand Avenue, Los Angeles California
BASE MAP: U.S. FOREST SERVICE 413-12
0 1/2 1 Mi.
0 5000 Ft.
NORTH
18 1/3°
113° 25'
44° 55'
BEAVERHEAD
NATIONAL
FOREST
IDAHO
MONTANA
SALMON NATIONAL FOREST
Lemhi Pass
SACAWAWEA MEMORIAL CAMP
Trail
SELWAY
27 Miles to ARMSTEAD
Creek
Bear
Trapper
Creek
Pan
Frying
North
South
Pan
Frying
Creek
Creek
Camp Creek
Agency Cr.
Horseshoe Bend Cr.
Buffalo #2
Buffalo #1
Wonder Lode
Lucky Strike No. 2
Wonder Lode #18
COPPER QUEEN
GOLD FLINT
BLUE BIRD
SAWYER PETROLEUM COMPANY
CONTINENTAL DIVIDE
IDAHO
MONTANA
BEAVERHEAD
NATIONAL
FOREST
T. 19 N.
T. 18 N.
R. 25 E.
T. 10 S.
T. 11 S.
R. 15 W.
R. 14 W.
J.S.H. 5-7-58: 5-26-58.

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1. An inclined shaft 52 feet in depth has been sunk on the outcrop of the vein near the center of the Last Chance claim. The shaft followed the footwall of the vein and from the bottom of the shaft a crosscut was driven to the hanging wall of the vein. At this point approximately eighteen feet of vein matter and ore was shown to exist at that depth. Grade and actual thickness of ore at the surface and in the shaft and attendant crosscut are clearly shown on the attached map labeled Exhibit B. This shaft and crosscut are open and are in good condition for examination and sampling procedures. The shaft is located near the presently known southeastern extremity of the vein structure.

2. A nearly horizontal crosscut adit has been driven southwest from a point approximately in the center of the Shady Tree claim for a distance of 495 feet and there intersected the downward extension of the vein at a depth of approximately 205 feet downdip. At the point of penetration the crosscut was swung to the right in order to drive across the vein at right angles to strike. The vein here measures 22 feet true width. The crosscut with attendant samples and widths is shown on the attached map labeled Exhibit C. This is known as level 6660.

3. From the above described crosscut a drift was driven to the southeast for a distance of 69 feet along the footwall of the vein. At a distance of 40 feet from the crosscut a small inclined doghole was driven to the hanging wall of the vein. At this point the structure measures 22 feet true width. Samples and widths of this material are shown on Exhibit C.

4. The crosscut above described in item 2 was driven an additional 37 feet with the intention of continuing to the point indicated on Exhibit C as "Proposed site of 200 feet underground shaft". This plan was abandoned in favor of the work described below in item 6. All work described in items 2, 3, and 4 are open and may be readily examined. The track is in, although the air line has been removed. All openings are approximately seven feet by five feet in cross section and with the exception of about 30 feet all openings are baldheaded.

5. From a point near the southwest corner of the Last Chance 40 claim a nearly horizontal adit was driven approximately 150 feet in a northwesterly direction along a high-grade lenticular vein occurring in the so-called Shear Zone structure. The ore bearing shear is now present along the southwest (hanging wall) side of the adit. The drift followed the shear for the full length but the width of the ore was such that additional work was reserved for the Last Chance vein as described below in item 6. This work along the shear zone is open and in good condition and examination of the work may be readily carried on.

6. From a point near the west end center of Last Chance claim 38, a crosscut was driven a total of 110 feet. The adit was originally intended to be driven a distance of 1100 feet in a southwesterly direction in order to intersect the downward extension of the vein at a point 180 feet vertically below the adit described in item 2 above, that is level 6660. The adit here described is known as level 6480. Depletion of operating funds forced the adit to be discontinued. This was the last work performed as exploration of the property. The adit is open and may be started at any time.

7. Both the Last Chance and the Shear Zone veins have been explored along the surface outcrops by means of bulldozed trenches. The Last Chance-Shady Tree vein has been more extensively opened than has the Shear Zone though both veins have been inadequately explored. The Last Chance-Shady Tree vein has been determined to have a strike length in excess of 1800 feet while less conclusive surface work indicates that the Shear Zone has a length of at least 4000 feet. Although nearly all of the surface cuts have sloughed to some extent, they are sufficiently open for examination and in most of them samples may be cut along the original pit bottom. All are sufficiently open for examination with radioactivity recording instruments. Profiles of radioactivity as measured along the pits at the time of the original excavations are shown on the attached map labeled Exhibit B and Exhibit D as the case may apply to the Last Chance-Shady Tree vein or to the Shear Zone structure.

8. With the exception of the fact that the several crosscuts, drifts, and shafts together with the bulldozed cuts have exposed the ore there are no production facilities now in existence. A complete camp has been built and is now being used. Roads are in to many points on the surface and to the several underground works so that these necessities will not have to be constructed. Ground space has been prepared for ore dumps. No mining equipment is now present on the property.

b. The applicants had no interest in the above described operations at the time those operations were carried out. However, at this time they do have interest in those operations by reason of their position as future operators of the property.

c. No commercial production has been made from the property although such production could have been attained from the underground workings or from many of the surface cuts. Production was not attained because of the past marketing situation regarding thorium bearing ores. The market situation has improved greatly during the past several months and a good demand now exists for thorium concentrates assaying ten percent or more ThO_2. It is felt that if sufficient ore can be discovered through exploration activities to warrant the erection of local treatment facilities, then production could be maintained at such degree to warrant

creating a market for the amount of concentrates that should be produced to offset exploration costs, mining and treatment costs, and capital investment.

d. Ore reserves for both the Last Chance-Shady Tree vein and the Shear Zone have been calculated on at least three different occasions. Although ore reserves have been calculated they have been predicted on the probability that the veins continue to a depth beyond that actually visible and the widths and grades as seen in the several underground openings and in the surface cuts persist over at least a major part of the structures. While this procedure is undoubtedly valid, firm ore reserve figures cannot now be calculated. It is because of this that additional exploration work is regarded necessary before major investment in plant and equipment can be allowed. Ore reserve figures were calculated by Mr. Leonard D. Jarrard for the United States Atomic Energy Commission and although that report is not available to the present operators the pertinent facts are shown on the map and calculations labeled Exhibits B and D. Selective mining operations would yield less tonnage and slightly higher grades than are shown on those maps. The accompanying geological reports both contain estimates of the ore reserves existing on the property. A combination of the several reports indicates that there are between 500,000 and 750,000 tons of ore present that will assay from 0.60 percent thoria to 1.00 percent thoria. The ore contained in the Last Chance-Shady Tree vein is about one-third greater than that in the Shear Zone but at the same time the ore in the Shear Zone is the higher grade of the two.

e. General Geology. Algonkian rocks previously mapped as the Ravalli group of the Belt series (Gregory, 1913) underlie most of the area and form rare outcrops. No estimate of the thickness of the group has been made for this locality. J. S. Vhay (U. S. Geological Survey, TEM - 30, 1950) noted a southward dipping conglomerate bed in the immediate area which may represent basal Cambrian strata. In general the rocks of the Ravalli group consist of a variety of light colored silicious sediments varying from nearly white quartzite to silicious shales or argillites which show drab hues of grey, green, or brown. Locally they contain foliated, metamorphosed sandstones and argillites of grey to light creamy-tan color. The formations in the area strike generally northwest and dip to the northeast. Although jointing may be observed locally, no major system is apparent. To the east, along Horse Prarie Creek, the Precambrian rocks are overlain by a series of Tertiary volcanics and lake beds. Along the Lemhi river to the west and for a distance of about four miles along Agency Creek, similar Tertiary volcanic rocks are exposed.

Ore Deposit Geology. The principal mineralized structure is the Last Chance-Shady Tree vein. It has the appearance of a

hydrothermal filled fissure deposit although generally no definite walls delineate either the ore zones or other lesser mineralized segments. The vein, which appears to be continuous for about 1,800 feet strikes approximately North 45 degrees West and dips from 45 degrees to 60 degrees to the southwest. The vein cuts bedding in the fine-grained micaceous standstone and argillite and outcrops of both vein structure and the country rock are rare. As exposed both in surface trenches and in the underground workings, the vein ranges from about 12 feet to more than 40 feet in width.

The Shear Zone orebody lies about 2,500 feet northeast of the Last Chance-Shady Tree vein and containing lenticular ore pods has approximately the same strike and dip as the Last Chance-Shady Tree vein. The Shear Zone has a projected strike length of about 4,000 feet. Ore pods occur en-echelon within a wide zone in which crushing and movement are reflected by offset pods and clay gouge seams. Although the width of the zone may be measured in tens of feet, the separate ore pods are usually not more than one or two feet in width. Lensing of individual pods, both horizontally and vertically is pronounced. Here, as in the Last Chance-Shady Tree vein, the highest grade ore is found within the zone and no definite confining walls are evident. Alteration of the country rock adjacent to the pods is more intense in the Shear Zone orebody and extends farther into the wall rocks than it does in the Last Chance-Shady Tree deposit.

The two deposits differ very little mineralogically, both are characterized by grey to pinkish quartz with barite and smaller amounts of hematite (also possibly Goethite) and specularite. Thorite, identified by the United States Geological Survey, accounts for the radioactivity of the Last Chance-Shady Tree vein while Xenotime, identified by the United States Bureau of Mines was said to be present in a highly radioactive specimen from the Shear Zone deposit. The radioactive minerals are finely disseminated throughout the ore and while uranium is present in minute quantities, no uranium minerals have been identified.

An area lying to the east of the Shear Zone deposit shows an abundance of quartz monzonite porphyry along road cuts. Although little work has been done on this exposure it seems probable that a dike of this material is present in the immediate area and that in all probability it will more or less parallel the strike of the two ore zones.

The attached Exhibits B, C, D illustrate the geology of the area as it has thus far been mapped.

f. Exploration work requested by this application is intended to explore certain known occurrences of ore bodies

existing both at the surface and at depth. Surface trenches have shown that the veins concerned may be expected to continue along strike but the amount of trenching thus far done is inadequate to definitely determine the continuity of the vein. Underground penetrations indicate that the vein has a considerable depth. The proposed exploration is directed toward ascertaining the continuity of the vein at depth and determining whether or not the strike length and grade at depth is commensurate with what is known and what is hoped to be shown at the surface. The strength of the structure both as regards length at the surface and width and grade at both surface and underground makes it appear that the exploration will probably be rather certain of success. Also the exploration is intended to ascertain the possibility of the existence of higher grade ore shoots and the continuance from surface exposures downward. The requested raising will assist in this evaluation.

g. The attached geologic reports are the only ones available to the operators. The first represents the work of Mr. Warren R. Wagner at the request of Mr. C. Andrade III, of Dallas, Texas, and the second the work of Mr. L. D. Jarrard at the request of Mr. George N. George of Laguna Beach, California.

3. Accessibility of Project:

a. Mr. Leonard D. Jarrard of Butte, Montana, will accompany representatives of the DMEA Field Team for the purpose of examining the property. In the event that Mr. Jarrard could not be present, the DMEA representatives should contact Mr. E. W. Sawyer or Mr. G. N. George at the Sawyer camp on the property.

From Butte, Montana, proceed south on US 91 to Armstead, Montana, a distance of 88 miles over black top all weather highway. At Armstead turn right on the graded and graveled road to Leadore, Idaho. About five miles past the Grant, Montana, post office turn right on the road designated Lemhi Pass. Keep left on the Lemhi Pass road to a point about one-half mile beyond the Selway ranch buildings. At this point turn left through the gate and proceed about three miles to the camp of the Sawyer Petroleum Corporation. Although the camp may be reached by conventional vehicle, complete access to all parts of the property is best made by four wheel drive car. Carbide or electric cap lamps should be carried by those making the examination.

b. Shipping by rail or motor freight may be made to or from Armstead, Montana, 37 miles from the mine camp. Supply centers serving the area are Butte, Montana, about 120 miles north, and Dillon, Montana, about 60 miles north of the camp. Day to day supplies may be obtained in Dillon but most of the larger and more expensive supplies and equipment will be purchased at

Butte or at Idaho Falls, Idaho, about 150 miles to the south on US 91 and on the Union Pacific Railroad. Rail facilities are available from the Union Pacific Railroad at Armstead. A complete and adequate camp has been built at the property and will suffice for both summer and winter operations. Present facilities will provide for the anticipated personnel and there should be no reason for employees to reside away from the area.

4. The Exploration Project:

a. The proposed exploration project has been set up in two phases or stages. Each stage consists of similar types of work. Neither type of work in the first stage is dependent upon the success of the others, but the work proposed for the second stage is dependent on the measure of success achieved during the first phase or stage of the program. Although rough outlining of the work proposed for completion during the second stage is herein presented a more complete request will be completed and submitted to the DMEA before undertaking that work.

The first stage of exploration consists of the following types of work:

1. Drifting on the vein on level 6660
2. Raising from level 6660 to the surface
3. Drilling to level 6480
4. Bulldozing of surface outcrops and projecting outcrops
5. Timbering of drifts as required
6. Building compressor and tool house
7. Assaying as required to a maximum
8. Supervision

The above enumerated types of work are presented and discussed as follows:

1. Drifting on the vein on level 6660. It is proposed to drift on level 6660 from the face as now existing from the 495 foot crosscut previously driven to the vein. It is intended to drift to the southeast for a distance not to exceed 900 feet from the present face. The drift is to be run along the footwall of the vein and at intervals of approximately 200 feet crosscuts are to be run to the hanging wall of the vein. If, at any point prior to completion of the 900 feet of drift, the ore should narrow to such width that mining operations would become unprofitable, then the drift may be discontinued after consultation with the DMEA representatives. The drift is to be seven feet by five feet in the clear and will be timbered where necessary. Although a rather uniform vein width is anticipated throughout the 900 foot distance, it is felt that the ore of better grade will be found to occur in ore shoots. One such shoot is anticipated within the first 500 feet of drift. This belief is based on the fact that the surface cuts now in existence

indicate that better than average grade ore lies in a zone approximately vertically above the present underground workings to a point approximately 700 feet southeast of that point.

In addition to drifting to the southeast from the 6660 crosscut it is proposed to drift in the opposite direction, that is to the northwest, on the vein for a distance of 500 feet from the crosscut. The same conditions as are listed above as applicable to the southeast drift would apply to the northwest drift and crosscuts would be run to the hanging wall the same as are discussed above. Inasmuch as no surface cuts are present above this proposed drift, nothing is known concerning the possibility of encountering higher or lower grade ore. The depth of the drift northwest below the surface will be slightly less than will be the southeast drift.

The drifting proposed for completion during the first stage is graphically shown on the attached map labeled Exhibit E.

Drifting presently contemplated during Stage II of the work will consist of driving the crosscut now started at level 6480 some 1000 feet to the southwest in order to crosscut the vein below level 6660. From this crosscut a total of approximately 1500 feet of drifting will be proposed for stage II. This tentative work is shown on attached map labeled Exhibit E.

2. Raising from level 6660 to the surface. During the progress of or following the completion of the drifting outlined in item 1 above, it is proposed to drive raises consisting of manway and chute from the drifts on level 6660 to the surface. One raise is to be driven from the 900 foot southeast drift and one raise from the 500 foot northwest drift. Together the two raises will approximate 490 feet and each is to be driven from a point later determined to be the most likely area to explore the ground lying between the drift and the surface and to have the greatest potential of showing minable ore above. The raises are shown on Exhibit E but the location as shown may not necessarily be the final location for the raises.

Raising contemplated during Stage II consists of approximately the same footage as in Stage I and Stage II raises are to be driven from level 6480 to level 6660. Stage II raises are likewise shown on Exhibit E but their location may also be changed later.

3. Drilling to level 6480. Either during or following the period of first stage drifting as outlined in item 1 above, it is proposed to core drill three holes from level 6660 to level 6480. These holes are intended to be collared on level

6660 at a point in the crosscut as far west of the vein as possible and to be drilled at such an angle as required in order to intersect the vein at level 6480. The holes are to be fanned out, one vertical, one bearing to the southeast and one bearing to the northwest. The total length of the holes will approximate 830 feet. The holes are intended to be NX size diameter. The first 150 feet could be non-core.

No drilling is contemplated during Stage II of the contract.

4. Bulldozing of surface outcrops and projected outcrops. Stage I work includes bulldozing of outcrops and bulldozing in areas where the outcrop is obscured by overburden. An appreciable amount of dozing has been accomplished in the past but there are long stretches on both the Last Chance-Shady Tree vein and the Shear Zone where no exploration has yet been performed. In some of the trenches thus far excavated the vein has been determined to be present but the dozing was not carried to sufficient depth to afford a realistic appraisal of either vein width or grade. Before bulldozing operations are completed it is felt that trenches should crosscut the vein at intervals no greater than 150 feet and that if possible some of the better exposures should be connected by trenches following the strike of the vein. This should be performed on both the Last Chance-Shady Tree vein and on the Shear Zone structure. In addition, trenches should crosscut the surface indications at points well beyond the immediate portions of the veins thus far discovered.

Stage I of the contract calls for 900 hours of bulldozer time. Some of the proposed trenches are shown on attached Exhibit B, D but other and additional locations will depend in some degree on the success encountered as the trenching progresses.

During Stage II of the proposed contract it is estimated that bulldozing work will consume approximately 100 hours of tractor time.

5. Timbering of drifts as required. The drifting and crosscutting now completed on the Last Chance-Shady Tree vein has required an average of about four lineal feet of timber per hundred feet of crosscutting and/or drifting. Based on this average it is anticipated that not more than 100 lineal feet of timber will be required during Stage I of the contract. When placed the timber shall be seven feet by five feet in the clear and back and sides shall be lagged sufficiently tight to prevent sloughing. Local Lodgepole pine shall be used for timber.

During Stage II of the contract it is thought that approximately 200 lineal feet of timber may be required.

6. Building compressor and tool house. It is requested that a combination compressor and tool house be permitted on

Stage I of the contract. To be adequate in size and space the structure should be 16 feet by 24 feet in dimensions and should be built near the portal of level 6660. It will be used for housing the compressor and small mining tools as well as providing space for mechanical work on various repairs that may be required.

An identical building is to be requested for Stage II of the contract. This building will be erected near the portal of level 6480 and will be used for the same purpose as the shed at level 6660.

7. Assaying as required to a maximum. During the progress of Stage I of the contract it is requested that a certain number of assays be permitted on the contract. The assays will be essentially radiometric but occasionally a chemical assay will be necessary. A total of 100 radiometric and 20 chemical assays are anticipated on Stage I.

Stage II is expected to require approximately the same amount of assaying as does Stage I.

8. Supervision. In order to insure that the program goes forward with the least possible delay and at the smallest cost possible, it will be necessary to maintain full time supervision. A person of adequate experience and ability will be employed for this purpose. It is felt that his services will be required for the full nine months expected as the duration of Stage I of the contract.

Stage II of the contract will require supervision as well as does Stage I and the supervisor should be required the full nine months anticipated for Stage II.

The foregoing discussion has dealt primarily with Stage I of the Contract and the work proposed for that Stage has been presented as clearly as possible. However Stage II has necessarily been only outlined as the possible program. It may therefore be shown during the progress of Stage I that the work presently proposed for Stage II could conceivably be better accomplished by concentrating efforts at points not here mentioned. This was the primary reason for dividing the work into two phases so that the first could determine the extent and possibilities of the orebodies as now known and also provide guidance for more intelligent planning of future work than would be possible at this time. Therefore, though Stage II is roughly outlined at this time, work requested for Stage II will be more completely appraised and requested at the completion of Stage I. Total amount of work then requested will however approximate that outlined in this request.

b. No additional access roads are thought to be necessary. Nearly all points at which work is contemplated may now be

reached by means of conventional vehicle without undue inconvenience.

c. In the event that this exploration request is approved, it is expected that work will be started within ten days after notice of approval of contract has been received by the applicant. Stage I of the contract can be completed within a period of nine months after start of work. Stage II can be completed in an additional nine months period. Total time of the combined Stages of work will therefore be completed in not more than 18 months working time.

Rate of progress for each major type of work is estimated to be as follows:

Drifting -- per face per shift---------- 5 feet
Timbering -- included in drifting above
Drilling -- per shift----------25 feet
Raising -- per shift---------- 4 feet

5. Experience:

The operators have had considerable successful experience in both mining and oil operations in Arizona, California, and Utah. Their financial resources are adequate to permit unstinted operations and to procure efficient operation and supervision. Mr. E. W. Sawyer Jr., is a graduate in geology from the University of California and he has had personal experience in the field. Like Mr. Sawyer, Mr. Jarrard is a graduate of the Montana School of Mines and has had many years of experience both in exploration and in operation.

6. Estimate of Costs:

The following estimates of cost have been divided into items that will be let for independent contract and those that are expected to be done on company account. The unit costs for company account items have been calculated only once and then that cost per unit has been considered applicable to both Stage I and Stage II of the proposed Contract.

a. Independent Contracts

The only item that is expected to be done under independent contract is item 4, a, 3, above (drilling). The applicant expects to contract this work but if no contractor is found available then that work too will be done by company account.

Drilling.

Number of holes---------- 3
Depth of holes, No. 1----------250 feet
No. 2----------290 feet
No. 3----------290 feet

Total Drilling----------830 feet
Estimated cost per foot--$7.00
Total Estimated cost---------- $5,180.00
No drilling is proposed for Stage II of the Contract.

b. Personal Services

Stage I

Type	Number	Rate	Period
Supervision	1	$ 750.00/mo.	9 months
Office	½	250.00/mo.	9 months
Miners	6	20.00/day	9 months
Laborers	2	18.00/day	9 months
Cooks	1	300.00/mo.	9 months

Stage II

Same as Stage I above.

The above listed types and numbers of employees are available in the area.

c. Operating materials and supplies

Blasting supplies, dynamite--------	$ 24.00	per hundred wt.
fuse----------	12.00	per thousand ft.
caps----------	2.00	per hundred
Pipe, 2 inch----------	0.75	per foot
3/4 inch----------	0.40	per foot
Mine Rail, 20 pound----------	12.00	per hundred wt.
Timber----------	70.00	per thousand b.f.

Small tools and equipment are presently on hand but their values are not included in contract cost estimates.

d. Operating equipment

Compressor, 600 c.f.m.------monthly rental----	$ 1,800.00	
Drilling machines, 55 pounds--3 monthly rental--	100.00	each
Underground loader----------monthly rental----	250.00	
Underground trammer, air----monthly rental----	200.00	
Drill steel (swede) equiv.		
16 pieces 6 feet--------purchase----------	28.00	each
International TD18 tractor		
with operator----------hourly rental-----	18.00	
Jeep pickups, 1955 model----2 owned----------	800.00	each

e. Initial rehabilitation and repairs

None of the equipment, buildings etc. now on the property or to be furnished by the applicant are in need of initial repairs.

f. New buildings, fixtures, installations

Stage I

The only new construction contemplated is the erection of a combination compressor house and tool shed. The building should be constructed of wood with tar paper roof. Dimensions should be 16 feet by 24 feet.

Estimated labor----------	$ 200.00
Estimated material---------	250.00
Heating equipment----------	100.00
Total cost of building----------	$ 550.00

Stage II

An identical and additional building is proposed for construction prior to the beginning of Stage II work.

Total cost Stage II----------$ 550.00

g. Miscellaneous

Repairs of major operating equipment will probably be limited to drilling machines and jeeps and drill steel. This category would be extremely difficult to estimate. In order to arrive at an equitable figure, the estimated cost of repairs has been included in itemized costs of operations in the several major classes of work on the contract. For all types of repairs that may arise an estimated cost of $0.80 per foot of drifting and raising has been charged to those types of work. This figure has been applied to work in both Stages I and II.

Estimated costs of workmens compensation, payroll taxes and liability insurance are as follows:

Stage I		
Social Security at 2.25%---------	$ 869.00	
Unemployment Comp. at 2.7%-------	1,044.00	
Industrial accid. at 11.65%------	4,504.00	
Total Stage I----------		$ 6,417.00
Stage II		
Social Security at 2.25%---------	$ 1,231.00	
Unemployment comp. at 2.7%-------	1,356.00	
Industrial accid. at 11.65%------	5,456.00	
Total Stage II----------		$ 8,043.00

Costs for analytical work are as follows for Stage I
Chemical assays, 20 at $15.00------$ 300.00
Radiometric assays, 100 at $3.00--- 300.00
Total Stage I----------$ 600.00

Stage II is the same as above for Stage I.

7. a. The applicant, Sawyer Petroleum Corporation, of Los Angeles, California, are prepared to furnish their share of the cost of the proposed contract in accordance with the regulations on Government participation stated in Sec. 7 of DMEA order - I. amended.

b. The applicant is prepared to furnish his share of the cost by providing money.

RECAPITULATION OF COSTS OF PROPOSED CONTRACT

Drifting

Calculated Cost Breakdown:

Item	Cost per foot
Labor	$ 12.00
Explosives	4.50
Air and water line	1.15
Track and ties (20 pound rail)	4.75
Drill steel	0.85
Hoses	0.20
Oil and Fuel	0.95
Repairs and miscellaneous	0.80
Drilling machines	0.65
Compressed air	2.75
Loader	1.20
Haulage, trammer and cars	2.40
Total cost per foot	$ 34.30

Raising

Calculated Cost Breakdown:

Labor	$ 15.00
Explosives	4.50
Air and water line	1.15
Drill steel	0.85
Hoses	0.20
Oil and fuel	0.95
Repairs and miscellaneous	0.80
Drilling machines	0.80
Compressed air	2.75
Haulage, trammer and cars	2.40
Hoist	1.35
Timber	10.00
Total cost per foot	$ 40.75

STAGE I

Drifting, 1,580 feet at 34.30 per foot	$ 54,194.00
Timbering, 100 feet at 8.00	800.00
Raising, 490 feet at 40.75 per foot	19,967.00
Drilling, 830 feet at 7.00 per foot	5,180.00
Bulldozing, 900 hours at 18.00 per hour	16,200.00
Supervision, 750.00 per mo. for 9 months	6,750.00
Office, 600.00 per mo. for 9 months	5,400.00
Buildings, 1 building	550.00
Soc. Sec., Unemployment and Indus. Accid.	6,417.00
Analytical work	600.00
TOTAL COST STAGE I	$116,058.00

STAGE II

Drifting, 2580 feet at 34.30 per foot	$ 88,494.00
Timbering, 200 feet at 8.00 per foot	1,600.00
Raising, 490 feet at 40.75 per foot	19,967.00
Bulldozing, 100 hours at 18.00 per hour	1,800.00
Supervision, 750.00 per mo. for 9 months	6,750.00
Office, 250.00 per mo. for 9 months	2,250.00
Buildings, 1 compressor house	550.00
Soc. Sec., Unemployment, Indust. Accid.	8,043.00
Analytical work	600.00
TOTAL COST STAGE II	$130,054.00
TOTAL COST OF PROPOSED PROJECT	$246,112.00
APPLICANTS SHARE OF TOTAL COST AT 50 PERCENT PARTICIPATION	$123,056.00
GOVERNMENTS SHARE OF TOTAL COST AT 50 PERCENT PARTICIPATION	$123,056.00

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
6/10	Ching	700
6/10	Kusnic	700
6/10	Selbrede	120
"	[illegible]	110
6/11	[illegible]	220
		700

JUN 10 1959

Mr. E. W. Sawyer, Jr., President
Sawyer Petroleum Company
650 South Grand Avenue
Los Angeles 17, California

Re: Docket No. DMEA-5043 (Thorium)
Sawyer Petroleum Company
Last Chance, et al., Claims
Beaver County, Montana

Dear Mr. Sawyer:

Reference is made to our letter of April 27, 1959, regarding submission of a new application under the OME program.

We wish to cooperate with you in allowing ample time to make the new application, but, if we do not receive your acknowledgment of this letter within thirty days from this date, we will assume that you are no longer interested in proceeding with your application, and we will consider it as having been withdrawn.

Sincerely yours,

(signed) FRANK E. JOHNSON

Acting Director

MChing/hb (6/10/59)
cc: Docket
Director's Reading File
T. H. Kiilsgaard, Rm. 5224
OME Field Team, Reg. I (2)
MChing

43683

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
4/27	Ching	700
4/27	Kuwait	700
4/27	Jeffrey	120
		700
4/28	Ee	220
		700

APR 27 1959

Mr. E. W. Sawyer, Jr., President
Sawyer Petroleum Company
650 South Grand Avenue
Los Angeles 17, California

Re: Docket No. DMEA-5043 (Thorium)
Sawyer Petroleum Company
Last Chance, et al., Claims
Beaver County, Montana

Dear Mr. Sawyer:

Reference is made to your letter of February 13 and ours of March 17, 1959, regarding submission of a new application under the OME program.

We have recently modified our requirements respecting financial statements and now require only your company's latest balance sheet and profit and loss statement, and the names of the five largest stockholders with percentage of ownership of each. Evidence of financial eligibility and other information requested in the new application form and in our letter of January 29, 1959, should also be supplied.

Please advise when we may expect to receive your revised application. If you are no longer interested in participating in the program, we shall appreciate being so informed.

Sincerely yours,

(signed) FRANK E. JOHNSON

Acting Director

MChing/GMcC
April 24, 1959

cc: Docket
Director's Reading File
THKiilsgaard, 5224
OME Field Team, Region I (2)
Mr. Ching

43683

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
3/16/59	Ching	700
3/16	Kuenzler	700
3/17	Selfridge	120
		~~110~~
		~~100~~
3/18	C	220
		700

MAR 17 1959

Mr. E. W. Sawyer, Jr., President
Sawyer Petroleum Company
650 South Grand Avenue
Los Angeles, California

Re: Docket No. DMEA-5043 (Thorium)
Sawyer Petroleum Company
Last Chance, et al., Claims
Beaverhead County, Montana

Dear Mr. Sawyer:

Reference is made to our letter of January 29, 1959, and yours of February 13, regarding action required to make your DMEA application eligible for consideration under the OME regulations.

When you submit your new application under the OME program, in order to expedite the processing, please include the latest detailed balance sheet of the company and net worth statements for the officers and directors and five largest stockholders with percentage of ownership of each.

Sincerely yours,

(signed) FRANK E. JOHNSON

Acting Director

MChing/gla
3-16-59
cc to: Director's Reading File
THKiilsgaard, 5224
Mr. Ching
OME Field Team, Region I (2) w/2cc Mr. Sawyer's letter 2/13/59

43683

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
3/16/59	Ching	700
3/16	Kuvaas	700
3/16	absent	120
		110
		100
		220
		700

Mr. E. W. Sawyer, Jr., President
Sawyer Petroleum Company
650 South Grand Avenue
Los Angeles, California

Re: Docket No. DMEA-5043 (Thorium)
Sawyer Petroleum Company
Last Chance, et al., Claims
Beaverhead County, Montana

Dear Mr. Sawyer:

Reference is made to our letter of January 29, 1959, and yours of February 13, regarding action required to make your DMEA application eligible for consideration under the OME regulations.

~~We wish to cooperate with you in allowing ample time to complete such action, but, if we do not hear from you within 30 days from the date of this letter, we will assume that you are no longer interested in proceeding with your application, and we will consider it as having been withdrawn.~~

Sincerely yours,

Acting Director

MChing/gla
3-16-59
cc to: Director's Reading File
THKiilsgaard, 5224
Mr. Ching
OME Field Team, Region I (2) w/2cc Mr. Sawyer's letter 2/13/59

Unless you submit your new application under the OME program, in which case please include the latest detailed plan of the company and net worth statements for the years ended December and first daughter entities

Initial process by, if under this guard.

43883

Second paragraph

When you submit your new application under the OME program, in order to expedite the processing, please ~~indicate~~include the latest detailed balance sheet of the company and net worth statements for the officers and directors and five largest stockholders with percentage of ownership of each.

SAWYER PETROLEUM COMPANY
OATMAN, ARIZONA

PETROLEUM AND MINERAL EXPLORATION

LOS ANGELES OFFICE
650 SO. GRAND AVE.
LOS ANGELES 17, CALIF.

February 13, 1959

OFFICIAL FILE COPY
O. M. E.
RECEIVED FEB 16 1959

DATE	INITIALS	CODE
2/16	C	220
"	Cling	700

Mr. Frank Johnson
Acting Director
Office of Minerals Exploration
Department of Interior
Washington 25, D.C.

Re: Docket No. DMEA-5043 Thorium
Last chance et al claims
Lemhi Pass District
Beaverhead County, Montana

Dear Mr. Johnson:

Thank you for your letter of January 29, 1959 and the enclosed OME regulations and forms.

We wish to participate in the Office of Minerals Exploration program.

Since the date of our application under the DMEA program, we have performed further exploration work on the property and we are now in process of revising our original application to reflect this work and to set forth a program to participate in the Office of Minerals Exploration Program.

As soon as we have this report finished and cost estimates computed we will forward to you the necessary copies and the other forms and affidavits for your consideration.

Yours truly,
SAWYER PETROLEUM COMPANY

E. W. Sawyer

By E. W. Sawyer Jr.
President

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION
Washington 25, D. C.

January 31, 1959

Memorandum for Docket

Subject: Withdrawal of Pending DMEA Applications

Effective this date, this pending DMEA application is considered withdrawn for statistical purposes.

If, at a later date, the applicant requests reconsideration under the OME program, all pertinent material in the DMEA file should be transferred to the new OME docket.

Frank B. Johnson
Acting Director

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
1/15/59	Ching	700
1/16	Krause	700
1/22	Selfridge	120
		~~110~~
		~~100~~
1/29	C	220
		700

JAN 29 1959

Mr. E. W. Sawyer, Jr., President
Sawyer Petroleum Company
650 South Grand Avenue
Los Angeles, California

Re: Docket No. DMEA-5043 (Thorium)
Last Chance, et al., Claims
Lemhi Pass District
Beaverhead County, Montana

Dear Mr. Sawyer:

Enclosed is a copy of the regulations for obtaining Federal assistance in financing mineral exploration under which the new Office of Minerals Exploration will operate.

If you wish that your partly-processed DMEA application be considered under the OME regulations, please complete and return four of the copies of the attached application, MME Form 40.

Your attention is called especially to the certification which when signed declares that you would not ordinarily undertake the proposed exploration under current conditions and circumstances at your sole expense, and to Item 1(a) - and 1(c) if applicable - which relates to information used to determine your financial eligibility under the new exploration program. Information that is included in your DMEA application need not be repeated in the OME application, but you can add new information if you so desire.

In your original application you stated that the property to be covered by the proposed project consisted of 44 unpatented lode mining claims which were shown on the map labeled Exhibit A. As a matter of fact, Exhibit A shows 47 claims or fractions. Furthermore, the claims shown on the map do not coincide with the 51 claims listed in Exhibits "A" and "B", attached to the escrow instructions, dated January 20, 1958. Inasmuch as a resurvey of the property was in process at the time of your original application, it is suggested that four copies of the new map be forwarded with MME Form 40. A list of all the claims shown on the map which are to be subordinated under the proposed project should also be attached, together with the book and page numbers of recordation of each location notice.

43683

It is essential that we be advised as to the exact status of your present property rights and whether or not the escrow instructions, dated January 20, 1958, have been fulfilled. Any royalty claims, liens, mortgages or other encumbrances on the property should be described in detail and two copies of the legal documents evidencing such claims or encumbrances forwarded with your new application. In this connection, we are enclosing six copies of the Lien and Subordination Agreements, MME Form 52, referred to in Item 2(c) of the application. Early submittal of five completed copies of the form will save time in case you apply for exploration assistance under the OME program and a contract is granted.

If you do not wish to participate in the OME program, we shall appreciate being so informed.

Sincerely yours,

Frank E. Johnson

Acting Director

Enclosures

MChing/gla
1-15-59
cc to: Director's Reading File
THKiilsgaard, 5224
Mr. Ching
OME Field Team, Region I (2)

OFFICIAL FILE COPY
O. M. E.
RECEIVED JAN 19 1959

DATE	INITIALS	CODE
1/19	C	220
1/23	HB	130
1/26	C	220
•	Ching	700

UNITED STATES
DEPARTMENT OF THE INTERIOR
Office of Minerals Exploration
So. 157 Howard Street
Spokane 4, Washington

December 4, 1958

MEMORANDUM

To: OME Field Team, Region I

From: William C. Prinz, Geologist, U. S. Geological Survey

Subject: Supplemental information for Field Examination Report, Docket No. DMEA-5043 (Thorium), Sawyer Petroleum Company, Last Chance, et al., claims, Beaverhead County, Montana

In my field examination report on this property dated September 30, 1958, I stated (on page 10) that the assays of three samples may be incorrect and that they were being checked by the U. S. Geological Survey laboratory in Denver. Pulps of these samples prepared by Peter Mack, who assayed the samples for the examination report, were submitted to the Geological Survey for chemical analysis. The following table gives the results of the check determinations by the Geological Survey with Mr. Mack's original determinations for comparison.

Sample No.	Assayer	ThO_2	Rare-earth oxides	ThO_2 + REO
DMEA-885	USGS	0.56	Not reported	
	Mack	0.31	0.34	
DMEA-886	USGS	0.04	0.12	
	Mack			Trace
DMEA-887	USGS	0.03	0.02	
	Mack			Trace

Reviewed by
OME OPERATING COMMITTEE
1-23-59
(date)

Also, results of a semiquantitative spectrographic analysis of Sample No. DMEA-885 is attached. It shows that the total rare-earth oxides in that sample is roughly 0.08 percent; total rare-earth oxides were not determined chemically by the Geological Survey.

The two sets of determinations are essentially the same except for the minor discrepancies in Sample No. DMEA-885. In that sample, the total of thoria plus rare-earth oxides is essentially the same, but Mr. Mack found less thoria and more rare-earth oxides than did the Geological Survey.

The results of these check determinations do not affect the conclusions reached in my field examination report.

SUP. TO ON-SITE EXAM. REPORT

Distribution:
OME (3); USBM (5); USGS(SRO)
Docket; Prinz; AEC, Grand Junction (2)

MF-500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE 1/14/59

REFERRED TO:

1. Operating Committee, OME
2. Washington, D. C.
3. Mr. Chiz
4.

FOR:

---------- Action	---------- Recommendation
---------- Approval	---------- Record of ----------
---------- Comment	
---------- Conference	---------- Referring to ----------
---------- Consideration	
---------- Filing	---------- Reply for signature of ----------
---------- Instructions	
---------- Investigation	---------- Rewriting
---------- Initials	---------- Signature
---------- Mailing	---------- Suggestions
---------- Previous correspondence	---------- Your information

REMARKS:
Supplemental information on a previously submitted Field Examination Report, Docket DMEA-5043 (Thorium), Sawyer Petroleum Co., Beaverhead Co., Montana.

Check (X) before the items needing attention.

Region I, Spokane
Initials of sender.
EMR

GPO 16—63815-1

SUPP TO ON-SITE EXAM. REP.

[illegible]

[illegible]	[illegible]		
TMS-3494	W. C. Prins and M. K. Carron		
5024	Spec. Lab. No. 3084	Plate No. III-2539	[illegible]

[illegible] are reported to the nearest number in the series 7, 3, 1, 5, 0.7, 0.3, 0.15, etc., in percent. The numbers represent midpoints of group data on a geometric scale.

[illegible] of this type of semiquantitative results with data obtained by quantitative methods, either chemical or spectrographic, show that the assigned group includes the quantitative value about 60% of the [illegible]

Symbols used are: - : not looked for
0 : looked for but not found (*see attached table of detectabilities*)
M : major constituent - greater than 10%
< with number : below number shown, here standard detectabilities do not apply

[illegible] No.	885		885
[illegible]	153559		153559
Si	M	La	.015
Al	.3	Li	0
Fe	1.5	Lu	0
Mg	.07	Mo	0
Ca	.15	Nb	0
Na	.015	Nd	.015
K	0	Ni	.003
Ti	.03	Os	0
P	0	Pb	.0015
Mn	.03	Pd	0
Ag	.00007	Pr	0
As	0	Pt	0
Au	0	Rb	0
B	0	Re	0
Ba	.3	Rh	0
Be	.0003	Ru	0
Bi	0	Sb	0
Cd	0	Sc	.0007
Ce	.03	Sn	0
Co	.0015	Sr	.03
Cr	.0015	Sm	0
Cs	0	Ta	0
Cu	.03	Tb	0
Dy	0	Te	0
Er	0	Th	.3
Eu	0	Tl	0
F	-	Tm	0
Ga	0	U	0
Gd	.015	V	0
[illegible]	0	W	0
Ge	0	Zn	.003
Hf	0		

By Spectrographic Services and Research, Wash. (HGP)
Katherine V. Hasel
Project Leader: Claude L. Waring
C. L. W.

Approved [illegible]

Liaison Officer
Atomic Energy Commission Program

OFFICIAL FILE COPY O. M. E. RECEIVED OCT 16 1958		
DATE	INITIALS	CODE
10/16	C	220
"	Ching	700
	pending	225

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

Date October 15, 1958
DMEA Docket No. 5043
DMEA Contract No.
Commodity Thorium
Name of Applicant Sawyer Petroleum Company
Location of property Beaverhead County, Montana
Estimated cost of project $246,112.

Memorandum

To: Frederick L. Knouse, Acting Director, OME
Rare and Misc. Minerals Div.

From: James Paone, Bureau of Mines Member JP
Uranium Commodity Committee

Subject: Review of Field Team Report
(Application, Field Team Report, etc.)

1. Date of subject document: 10/6/58 2. Date received by reviewer: 10/15/58

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

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

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

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

7. Explain items marked 'yes' above:

8. Factors meeting special consideration:

a. Location ☐
b. Ownership ☐
c. Evidence of mineralization ☐
d. Geology ☐
e. Proposed exploration method ☐
f. Alternate exploration method ☐
g. Costs
h. ☐

9. Action advised:

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

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION
So. 157 Howard Street
Spokane 4, Washington
October 6, 1958

OFFICIAL FILE COPY
O. M. E.
RECEIVED OCT 13 1958

DATE	INITIALS	CODE
10/13	C	220
10/17	LB	130
10/20	C	220
"	Chrin	700
	Pending	225

Mr. George C. Selfridge, Chairman
Operating Committee, OME
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-5043 (Thorium)
Sawyer Petroleum Company
Last Chance, et al., Claims
Beaverhead County, Montana

Dear Mr. Selfridge:

Enclosed is a memorandum from William C. Prinz, Geologist, U. S. Geological Survey, recommending exploration of the Last Chance, et al., claims in Beaverhead County, Montana. The Field Team concurs that exploration of this property is warranted. However, it will have to be re-examined after the new program goes into effect to determine what modifications of the proposed program are necessary or desirable as a result of work now in progress. A cost analysis can be made at that time.

By Field Team, Region I

A. E. Weissenborn, Executive Officer
U. S. Geological Survey

Wing G. Agnew, Member
U. S. Bureau of Mines

Enclosures
cc: USBM(2)
USGS(SRO)
Prinz
AEC, Salt Lake
AEC, Spokane

Reviewed by
OME OPERATING COMMITTEE
10-17-58
(date)

ON-SITE EXAM. REPORT

DMEA

OFFICIAL FILE COPY
O. M. E.
RECEIVED OCT 13 1958

DATE	INITIALS	CODE
10/17	HB	130
		220

UNITED STATES
DEPARTMENT OF THE INTERIOR
Office of Minerals Exploration
So. 157 Howard Street
Spokane 4, Washington

September 30, 1958

MEMORANDUM

To: OME Field Team, Region I

From: William C. Prinz, Geologist, U. S. Geological Survey

Subject: Field Examination Report, Docket No. DMEA-5043 (Thorium), Sawyer Petroleum Company, Last Chance, et al., claims, Beaverhead County, Montana

INTRODUCTION

An application for DMEA assistance to explore for thorium on the Last Chance, et al., claims, Beaverhead County, Montana, was received June 4, 1958, from the Sawyer Petroleum Company, Catman, Arizona. The applicant proposes to explore the property by a two-stage program including 4,160 feet of crosscutting and drifting on two levels, 980 feet of raising, 1,000 hours of bulldozer work for trenching, and 830 feet of diamond drilling. He estimates that the program would cost $246,112; Government participation at 50 percent would be $123,056.

The property was examined on June 10 and 11, 1958, accompanied by L. D. Jarrard, Consulting Geologist, and George N. George, a mining promoter who has been associated with much of the recent work at the property. Roy Hammond, Hammond and Everly Engineering Company, Butte, Montana, was conducting a resurvey of the property at the time of my visit. Contract miners were also at the property preparing to continue the drift southeast on the 6660 adit level.

Under the terms of a previous DMEA contract (Docket No. DMA-1183X, Elkhorn Mining Company, Contract No. Ioh-E144) 700 lineal feet of bulldozer trenches and 637 feet of diamond drilling was completed in the southeastern part of the Last Chance-Shady Tree vein (pl. 2). This contract was terminated by mutual agreement before completion, and the work performed did not result in a Certification of Discovery or Development. Since termination of of this contract, considerable work has been done, which has enhanced the potentialities of the property.

Reviewed by
OME OPERATING COMMITTEE
10-17-58
(date)

SUMMARY

The Last Chance, et al., claims are underlain primarily by Precambrian Belt series quartzite and argillite, host rocks for the thorite-bearing veins and structures. The strongest vein is a thorite-bearing, quartz-hematite vein that strikes northwest and west across the Last Chance and Shady Tree claims. This vein dips 45°-65° southwest to south, and varies in thickness from 5 to 40 feet. Calculations of inferred reserves along this vein show that the target area may contain 500,000 tons of ore averaging between 0.7 and 1.0 percent thoria. A second major thorite-bearing structure on the property is the Shear Zone vein which lies about three-quarters of a mile east and northeast of the Last Chance-Shady Tree vein. The Shear Zone vein is a complex shear or fracture zone containing numerous, en echelon, thorite-rich quartz-hematite stringers or hematite pods. The individual stringers are very high grade, but the average for the whole zone is low. It is doubtful that ore-grade material could be maintained over a minable width for any great distance.

RECOMMENDATIONS

A program similar to that proposed by the applicant is recommended for approval to explore the Last Chance-Shady Tree vein, but no further work is recommended for the Shear Zone vein. These recommendations are made with the reservation that the property be re-examined before a contract is approved because the applicant is planning to carry out some of the recommended work on his own while action on his application is pending.

LOCATION AND ACCESSIBILITY

The Last Chance, et al., claims are mainly in secs. 20, 28, and 29, T. 10 S., R. 15 W. (pl. 1), Beaverhead County, Montana. The claim group has been called "Last Chance Group," "Wellborn Claims," "Selways," "Thorium Metals," and "Sawyer Petroleum Property," and the northern claims were at one time called the "Lucky Strike" and "Trapper" claims. The northern edge of the property is along the Idaho-Montana boundary with numerous thorium prospects being found on both sides of the line. This area is commonly referred to as the Lemhi Pass District, with the Montana portion being called the Frying Pan District and the Idaho portion, the Agency Creek or McDevitt District.

The Last Chance, et al., claims are accessible by passenger car from the Lemhi Pass road between Tendoy, Idaho (21 miles southeast of Salmon) and Armstead, Montana (22 miles southwest of Dillon) (fig. 1). From the Selway Ranch, which is on the Lemhi Pass road about 27 miles west of Armstead, Montana, proceed 0.3 mile west, then turn southwest on the road up Frying Pan and South Frying Pan Creeks and continue for 3 miles to the camp near the

eastern edge of the property. Although snowfall may make access to the property difficult, the applicant's camp is equipped for winter use and underground exploration could be carried on throughout the winter months.

APPLICANT

The applicant, Sawyer Petroleum Company, Oatman, Arizona, is an Arizona corporation whose main offices apparently are 650 So. Grand Avenue, Los Angeles 17, California, the address listed for all of the corporate officers. The company proposes to furnish its share of the proposed exploration work by providing money.

The applicant is reported to have had considerable experience both in mining and petroleum ventures in the southwestern states and the manner in which they are approaching the work at the Lost Lode claims bears out this statement. They have retained L. D. Jarrard, formerly chief geologist of the AEC Butte, Montana, sub-office, as consulting geologist, and the firm of Hammond and Everly Engineering Company, Butte, to conduct a complete resurvey of the property.

PROPERTY RIGHTS

The applicant's property consists of a group of unpatented lode claims. At the time of my examination, the status of the claims was not perfectly clear because certain escrow agreements were to be fulfilled. (See letter dated January 20, 1958, with application.) Also, the resurvey may result in the redefining of some of the claims and the locating of new ones to completely cover the ground.

The claims are shown in two places in the application: on map Exhibit A (pl. 1 of this memorandum) and in an escrow agreement dated January 20, 1958. Thirty-four claims (Last Chance, Last Chance Nos. 1 - 4, 25, 29-34, 36-42, 39A, A-J, Frying Pan, Frying Pan No. 2, Shady Tree, and Brown Bear) are common to both documents; 17 claims (Last Chance Nos. 5, 26, and 27, Ragand and Ragand Nos. 1-13), as well as David Tunnel site and Last Chance Tunnel site, are shown only in the escrow agreement; and 13 claims (David Nos. 1-9, 1A, and 3A-5A) are shown only on the map. Parts of the David claims in the northern part of the claim group (pl. 1) were at one time called the Lucky Strike No. 1, Trapper No. 1, and Trapper No. 4 claims. (See U. S. Geol. Survey Bull. 988H, fig. 47.)

Checked me.

Since the DMEA program has ended, no attempt has been made to resolve these discrepancies or to keep abreast of the resurvey of the property. When, and if, the application is considered, the applicant should be asked to resubmit a new claim map and restate the description of the property to be explored.

DESCRIPTION OF PROPERTY

Topographic setting

The Last Chance, et al., claims are on the east flank of the Beaverhead Range and are bordered on the north by the Continental Divide. Altitudes at the property range from about 7,500 to 8,500 feet; those shown on plate 1 appear to be about 500 feet too low and those on plate 2, about 1,500 feet too low. The South and North Forks of Frying Pan Creek flow easterly through the property. Slopes are moderately steep and are generally wooded.

Previous exploration

Previous work at the property has included trenching, drifting and crosscutting, shaft sinking, and diamond drilling. The most extensive trenching has been along the Last Chance-Shady Tree vein on the Last Chance and Shady Tree claims (pls. 1 & 2). The Shear Zone structure to the east has been trenched sporadically from the Last Chance No. 40 claim northwesterly through the Last Chance No. 42, 3, 8, and 1 claims into the David No. 5A and 1A claims (pl. 1). Some trenching has also been done in the northwestern part of the property on the David No. 3 and 4 claims. These last-named trenches were not visited as they are not on a target which the applicant proposes to explore.

The most extensive underground work has been on the Last Chance-Shady Tree vein. The 6660 adit was driven south-southeast 510 feet to intersect the vein in the central part of the Shady Tree claim (pls. 1, 2, & 3) and was continued for 100 feet beyond the vein. From this adit, 70 feet of drifting along the footwall of the vein was completed and a small dogholo was driven to the hanging wall. To the northeast, the 6480 crosscut adit to the vein has been started. This adit is about 180 feet vertically below the 6660 adit and has been driven about 100 feet; 1,000 feet remain before the vein will be intersected (pl. 2). About a quarter of a mile southeast of the 6660 adit, a 32-foot inclined shaft was sunk on the footwall of the vein. From the bottom of the shaft, a 20-foot crosscut was driven to the hanging wall.

The Shear Zone structure has been explored by a 150-foot adit driven northwesterly along the structure in the southern part of the Last Chance No. 40 claim (pl. 1).

Under the terms of a previous DMEA contract (Docket No. DMA-11861, Elkhorn Mining Company, Contract No. 14m-E144), three holes were diamond drilled in the southeastern part of the Last Chance-Shady Tree vein (pl. 2). DDH 1 was drilled N. 43° E., -45°, and bottomed at 239 feet, apparently in vein material. The vein was first cut at 223.5 feet, but from 231 feet to the bottom of the

hole, only 2 inches of core was recovered. DH 3 was drilled N. 40° E., -45°, and bottomed at 308 feet. Vein material was found between 264.6 and 284.6 feet. DH 4 was drilled N. 50° E., -45°, and was bottomed at 95 feet before penetrating the vein.

Mine facilities

There is a compressor and tool shack at the portal of the 6660 adit and at the time of the examination, equipment was being assembled in preparation to continuing the drift southeast. There are no facilities or equipment at the sites of the other underground workings. A camp is located along the South Fork of Frying Pan Creek near the eastern edge of the property. The camp consists of a cook shack, generator house, engineering office, and two bunk houses.

Production

At the time of the examination, no ore had been produced from the property; however, several weeks later L. D. Jarrard telephoned and reported that the applicant was planning to convert Minerals Engineering Company's old tungsten mill at Glen, Montana (70 miles northeast of the property) to handle thorium and that they hoped to be in production shortly.

GEOLOGY

General geology

The geology of the Last Chance, et al., claims and surrounding country has been described by the following:

Fries, A. F., and Tooker, E. W., 1955, Uranium and thorium deposits in east-central Idaho and southwestern Montana: U. S. Geol. Survey Bull. 988E

Sharp, W. N., and Cavender, W. S., 1955, Thorium deposits of the Lemhi Pass District, Lemhi County, Idaho, and Beaverhead County, Montana (abstract): Geol. Soc. America Bull., v. 64, p. 1555

Anderson, A. L., 1938, Uranium, thorium, columbium, and rare earth deposits in the Salmon region, Lemhi County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 115

Armstrong, F. C., 1954, Field Team final report, Contract No. Idm-E144, Docket No. DMA-1186X, Last Chance Group, Elkhorn Mining Company

Two recent MLM applications (Docket No. MMA-4971, Agency Creek Thorium and Rare Metals Corporation, Cogo, et al., claims; and Docket No. MMA-5097, Hughes Exploration, Inc., Buffalo claim) are within 3 miles of the Last Chance property. Application examination reports on these properties have been prepared by D. C. Alvord, Geologist, U. S. Geological Survey. Reports on the Last Chance property by two consulting engineers are included with the application. Leonard D. Jarrard, formerly chief of the AEC Butte, Montana sub-office prepared one report in March 1957, and Warren R. Wagner, Boise, Idaho, prepared the other in April 1957.

The Lemhi Pass District is underlain primarily by light- to dark-gray micaceous quartzite and argillite of the Precambrian Belt series. They are probably complexly folded and faulted, but the structural details cannot be worked out because of poor exposures. Bedding commonly strikes N. 30°-75° W. and dips 15°-60° NE, but other orientations have been noted. The Belt rocks have been intruded by small green to gray-green porphyritic diorite dikes. Tertiary volcanic rocks, probably the Challis volcanics of Oligocene (?) age, overlap both the Belt rocks and the dioritic dikes. The volcanics range from basalt to rhyolite in composition. The Belt quartzites and argillites form the host rock for the ore deposits; however, mineralization probably occurred during emplacement of the late Cretaceous Idaho batholith.

Several classifications have been used in describing the ore-bearing veins of the Lemhi Pass District; for this report, a threefold classification will suffice: (1) In the Idaho portion of the district, several copper-bearing quartz veins as wide as 10 feet have been found and at least one, the Copper Queen, has yielded some production. A few of the copper veins contain thorite as a minor accessory mineral and in one place, the Wonder Lode mine, a vein of this type contains as much as 3.0 percent thoria; (2) the most important vein type insofar as thorium mineralization is concerned comprises quartz-hematite veins which form fracture fillings in the Belt rocks. They may be as wide as 50 feet, are reddish brown, and consist mainly of quartz and hematite, and some goethite, chalcedony, thorite, and barite. In places, barite becomes an important constituent. Veins of this type are commonly highly fractured showing initial quartz and barite shattered by recurrent movement and recemented by later quartz, barite and specularite, hematite, goethite, and thorite. The more highly fractured parts of the vein should, therefore, contain more thoria. As yet, not enough systematic sampling with this thought in mind has been done to substantiate this conclusion; and (3) the final group comprises the replacement veins or pods found along complex shear or fracture zones. The individual veins or pods are seldom more than 2 feet wide and are commonly arranged en echelon within the wide fracture zone. The ore pods consist either of thin thorite-bearing quartz-hematite veinlets or of thorite, hematite, and other iron oxides with little or no

quartz. The grade of the individual pods is very high, but that of the whole zone is low. The general strike of the ore-bearing structures of all three types is northwest to west, and the dip, south of southwest.

Excluding the copper-bearing veins, most of the claims in the Lemhi Pass District were staked over veins showing anomalous radioactivity by prospectors searching for uranium. It has been shown, however, that the uranium content of these veins is generally 0.00% and that the anomalous radioactivity is due mainly to thorium. It is generally impossible to identify thorium minerals in hand specimen, but the presence of thorite in many places has been proved by detailed laboratory studies. The thorite alteration product, hydrothorite, has been tentatively identified from a few places. Also, the rare-earth metals yttrium, cerium, samarium, neodymium, gadolinium, and lanthanum have been found by spectrographic analyses.

Local geology

Poor exposures on the Last Chance, et al., claims make it impossible to work out structural details, but bedding in the Belt quartzite and argillite appears to have a general northwesterly trend and gentle northeasterly dip. Two ore-bearing structures, both of which strike northwest and dip southwest, are considered in this application: (1) The Last Chance-Shady Tree vein, a large thorite-bearing quartz-hematite vein in the Last Chance and Shady Tree claims (pls. 1, 2, & 3); and (2) the Shear Zone vein, a wide fracture zone containing thorite-rich streaks and pods exposed in the Last Chance No. 40, 42, 3, H, I, and J claims (pl. 1). Other thorite-bearing structures are reported at the property, e.g., a quartz-hematite vein on the Brown Bear claim (Trites and Tooker, 1953, p. 201) and similar veins in the northern part of the property on claims formerly called the Lucky Strike No. 1 and Trapper Nos. 1 and 4 (Trites and Tooker, 1953, p. 196-200).

Last Chance-Shady Tree Vein.--The strongest structure at the property is the Last Chance-Shady Tree vein a thorite-bearing quartz-hematite vein that has been exposed over a strike length of about 2,400 feet (pls. 1 & 2). The vein strikes northwest and dips 45° SW. in the Last Chance claim but gradually changes to a westerly strike and a southerly dip of about 65° in the Shady Tree claim. It is from 5 to 40 feet thick with the average thickness being between 15 and 20 feet. It is composed of white or gray to red-brown quartz and hematite with some other iron oxides, barite, and thorite. The last-named mineral cannot be identified in hand specimen but has been found by the U. S. Geological Survey by X-ray diffraction patterns (Armstrong, 1954, p. 5). In many places the vein material is highly fractured and Armstrong (1954) reported that thin-section study showed that it is probably thorite associated with iron oxides in the healed fractures.

The vein is well exposed in the 6660 adit (pl. 3) and in the crosscut from the bottom of the 52-foot incline shaft in the center of the Last Chance claim. Exposures in the trenches are poor as many of the trenches are old and badly caved. However, the presence of the vein at the surface can be verified by (1) patches of exposed vein which were found in some of the trenches, (2) maps prepared by U. S. Geological Survey geologists when many of the trenches were new (Fritts and Tooker, 1933, and Armstrong, 1934), and (3) radiometric profiles prepared by the AEC (pl. 2). I was able to verify the value of the crests of these profiles in many places. In the 6660 adit the hanging wall of the vein is marked by a 1- to 2-foot altered rhyolite dike (pl. 3).

Numerous assays from the Last Chance-Shady Tree vein, both chemical and radiometric, are posted on plates 2 and 3, and those from Geological Survey or AEC sources also are tabulated below:

Sample no.	Width (feet)	Radiometric ThO_2	ThO_2	Rare earth oxides	ThO_2 + REO
DMEA-882	2		0.08	0.09	
-883	11		0.74	0.86	
-884	8		1.13	0.97	
-885	24		0.31	0.34	
-886	13½				Tr
-887	8				Tr
LC-B	3-4		0.05		0.06
-E	20		0.06		0.05
-G	3-4		0.93		1.70
-H	4		0.05		0.05
KW-LC-1	3		0.51		
-2	3		0.53		
-3	4		2.1		
-5	8		1.8		
-6	Grab		1.7		
AFT-S24-50	Grab	0.5			
-S25-50	1	2.4			
-S26-50	1	2.4			
-S32-50	5	0.8	0.79		
-S33-50	5	0.2			
-S34-50	25	0.04			
-S35-50	40	0.07			

DMEA samples 883 and 884 were cut across the vein in the deghole southerly from the footwall drift east in the 6660 adit. The assays are similar to radiometric determinations of samples from the same area by the AEC (pl. 3) and by Warren Wagner (report submitted with application). DMEA sample 882 was cut across the altered dike along the hanging wall of the vein. Sample 885 was cut across the footwall portion of the vein in the main crosscut in the 6660 adit. The thoria assay of this sample is lower than radiometric determinations of samples from the same area by the AEC, 0.52 percent thoria (pl. 3), and by Wagner, 0.57 percent thoria. Perhaps the DMEA assay is incorrect or the other determinations include rare earth oxides, which were high in the DMEA sample. This sample has been submitted to the U. S. Geological Survey laboratory in Denver for analysis, the results of which will be reported later. DMEA samples 886 and 887 are from the crosscut in the bottom of the shaft on the Last Chance claims. These samples assayed a trace of thoria plus rare earth oxides, whereas samples cut by Wagner in the same area showed an average of 0.62 percent thoria. These two DMEA samples have also been sent to Denver for checking. The remainder of the assays posted on the table were cut at the surface in the southeastern portion of the vein. They are taken from U. S. Geological Survey Bulletin 988H (Trites and Tooker, 1953) and from DMEA Final Report, Contract No. Idm-2384 (Armstrong, 1954). KW-LC-1 through KW-LC-3 and AFT-832 and 833-50 represent series of samples across the width of the vein.

Assays of core from two diamond drill holes -- DDH's 1 and 3 -- in the vicinity of the shaft (pl. 2) average from 0.034 to 0.30 percent thoria (Armstrong, 1954). These assays may not be significant because core recovery from the holes was erratic, varying from nil to 100 percent, and because the thorite is apparently associated with hematite and some of it may have been lost with the sludge.

Ore reserves can be inferred for two potential ore bodies along the Last Chance vein. The largest is in the western part of the vein and is arbitrarily taken to extend from a point 90 feet west of radiometric profile 9, eastward for 800 feet to a point 100 feet west of profile 6 (pl. 2). The presence of this ore body is indicated at the surface by radiometric profiles 7, 8, and 9, and by highly radioactive vein material exposed in recent dozer trenches between profiles 6 and 7. Its presence at depth is established by the exposures in the 6660 adit. If we assume that the ore body is continuous along strike for 800 feet and extends 60 feet below the 6660 adit, and that it averages 22 feet in width, about 340,000 tons of ore can be inferred. If it is assumed that it extends 80 feet below the proposed 6480 adit, then a total of 530,000 tons can be inferred. Based on assays of samples cut in the 6660 adit and on the strength of the surface radiometric anomalies, it appears that the grade of this material would average between 0.7 and 1.0 percent ThO_2.

No reserves are calculated for the portion of the vein including radiometric profiles 6, 5, 4, and 3 because these profiles are all generally low; assays through this area are also generally low, and geologic mapping, when exposures were better, shows that the vein there is commonly narrow (Armstrong, 1954, fig. 3). Reserves can be tentatively calculated for the vein from a point 100 feet southeast of profile 1, northwesterly for 300 feet to a point about midway between profiles 2 and 3. Although assays in this area are erratic, most are above 0.5 percent thoria and many are above 1.0 percent thoria. A depth of 100 feet will be assumed for this ore body even though assays of DMEA samples from the bottom of the shaft are low because, as has been noted, these results may not be correct. To extend it deeper does not appear warranted because of the discouraging results found in DDH's 1 and 3. Assuming a conservative width for the vein, 10 feet, the inferred reserves here would be about 25,000 tons.

Shear Zone Vein.--The Shear Zone vein has been traced northwesterly for about 4,000 feet across the Last Chance No. 40, 42, 3, J, and I claims into the David claim group (pl. 1) and is exposed in numerous surface cuts and at the breast of the adit on the Last Chance 40 claim. It consists mainly of an irregular shear zone which may be as wide as 50 feet containing numerous en echelon quartz-hematite stringers as much as 2 feet wide, and hematite-rich pods and lenses. The composition of the quartz-hematite stringers is similar to that of the Last Chance-Shady Tree vein except that the stringers are generally more radioactive and thus richer in thorite. The hematite-rich lenses are also highly radioactive and thorite rich.

Radiometric profiles across this zone prepared by the AEC (Exhibit D with the application) gave rather erratic results. Some profiles with only low crests are found adjacent to those with very high crests. The highest readings, 8 MR/hr, were found in the southwest corner of sec. 21, on property not open for claim location.

Assay results of three samples collected during my examination are posted on plate 1 and are tabulated below.

Sample No.	Width	% ThO_2	% REO	% ThO_2 + REO
DMEA-888	8'			Tr
DMEA-889	Grab	18.48	2.20	
DMEA-890	11"	3.56	0.23	

Sample 888 was cut across the whole Shear Zone vein at the breast of the adit on the Last Chance No. 10 claim; sample 889 is a grab from a $1\frac{1}{2}$-inch wide high-grade lens in this zone near the breast. Sample 890 was cut across a quartz stringer in the Shear Zone vein in a cut a short distance northwest of the adit. Although high-grade samples can be found in this vein, they apparently are from small, discontinuous streaks, and thorite-rich material probably could not be found over a minable width for any great distance.

APPLICANT'S PROPOSAL

The applicant proposes to explore the property by a two-stage program as follows:

Stage I:

(1) Drift 900 feet southeast and 500 feet west along the footwall of the Last Chance-Shady Tree vein on the 6660 adit level (pl. 2).

(2) Crosscut southerly to the hanging wall of the vein at intervals of about 200 feet. About 180 feet of crosscut would be required.

(3) Drive two raises along the vein from the 6660 level to the surface. About 490 feet of raise required.

(4) Trenching requiring 900 hours of bulldozer time. Locations of proposed trenches on the Last Chance-Shady Tree vein are shown on plate 2; those on the Shear Zone vein are shown on Exhibit D submitted with the application.

(5) Diamond drill three holes from the 6660 adit to intersect the vein at the level of the 6480 adit. About 850 feet of drilling would be required.

(6) Construction of buildings, assaying, supervision, timbering, accounting, etc., required to complete the above-listed work.

Stage II:

(1) Continue 6480 level crosscut southerly for 1,000 feet to intersect vein (pl. 2).

(2) Drift 900 feet southeast and 500 feet west along the footwall of the vein.

(3) Crosscut southerly to the hanging wall of the vein at intervals of about 200 feet. About 180 feet of crosscut would be required.

(4) Drive two raises from the 6480 to the 6660 adit levels. About 490 feet of raise required.

(5) Trenching requiring 100 hours of bulldozer time.

(6) Construction of buildings, assaying, supervision, timbering, accounting, etc., required to complete Stage II work.

The applicant estimates that Stage I would cost $116,058, and Stage II, $130,054, for a total cost of $246,112. Government participation at 50 percent would be $123,056.

The applicant's proposed program is more than adequate to explore the Last Chance-Shady Tree and Shear Zone veins and I believe that it should be reduced as follows:

(1) Omit all trenching on the Shear Zone vein as this target does not warrant further exploration at the present.

(2) Omit most of the trenching on the Last Chance-Shady Tree vein. Trenching to date has proved the continuity of the vein for considerable distance and little would be gained from further trenching within this area. However, a limited amount of trenching to prove the extension of the vein to the west and to the southeast would be desirable.

(3) Omit buildings and facilities at the portal of the 6660 adit as this work had been almost completed at the time of my examination.

(4) Omit the raises. The continuity of the vein is established at the surface; if it is established at two levels by drifting, the raising would surely be unnecessary for purposes of exploration.

(5) Omit the diamond drilling from the 6660 to the 6480 level. These holes would intersect the vein at a very flat angle, less than 25°, and could turn parallel with the vein and thus miss it. Negative results from this drilling program would thus prove nothing. Drilling from other sites would be impractical.

Furthermore, since the first target of the exploration program would be to explore for the potential ore body in the vicinity of the 6660 crosscut, changing the staging of the program to make a smaller Stage I and larger Stage II appears warranted.

RECOMMENDED PROGRAM

The following program to explore the Last Chance-Shady Tree vein is recommended for approval. However, if formal action is delayed, the property should be re-examined because exploration is currently in progress and part of the recommended work may be completed shortly, making it necessary to modify the recommended program.

Stage I:

(1) Drift 500 feet southeast and 500 feet west along the footwall of the Last Chance-Shady Tree vein on the 6660 adit level.

(2) Crosscut southerly to the hanging wall of the vein at intervals of about 150 to 200 feet. About 130 feet of crosscut would be required. These crosscuts need not be as large as the main drift.

(3) Trenching to determine the extent of the Last Chance-Shady Tree vein to the southeast and to the west. About 100 hours of bulldozing would be sufficient.

(4) Necessary assaying, supervision, technical services, etc.

Should Stage I be successful, Stage II designed to further explore the Last Chance-Shady Tree vein on the 6660 adit level and on the 6480 adit level is recommended for approval.

Stage II:

(1) Drift along the footwall of the vein an additional 500 feet on the 6660 adit level.

(2) Continue the 6480 crosscut southerly to intersect the vein. About 1,000 feet additional work would be required.

(3) Drift west and southeast a total of 1,400 feet on the footwall of the vein on the 6480 level.

(4) Crosscut southerly to the hanging wall of the vein at intervals of about 150 to 200 feet from the footwall drifts on the 6660 and 6480 levels. About 230 feet of crosscut would be required and they need not be as large as the main drifts.

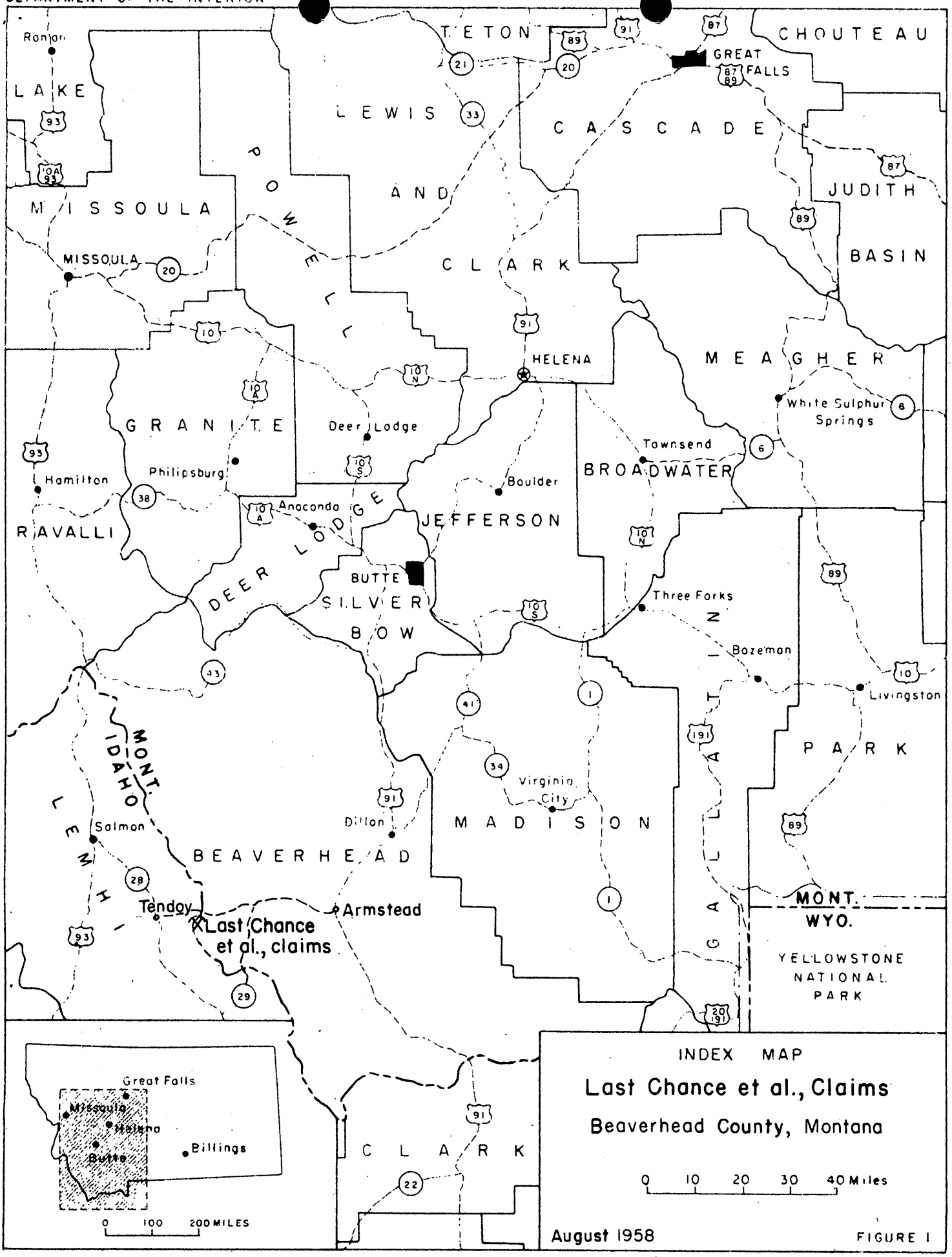
(5) Necessary assaying, supervision, technical services, etc.

Enclosures
Distribution:
DMEA(3); USBM(5); USGS(SRO)
Docket; Prinz; AEC, Spokane 14
AEC, S.L.

UNITED STATES
DEPARTMENT OF THE INTERIOR

PREPARED FOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

DOCKET NO. DMEA 5043



August 1958

FIGURE 1

OFFICIAL FILE COPY
O. M. E.
RECEIVED OCT 13 1956

DATE	INITIALS	COD

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
9/19	Kagan	700
4	Cole	100

SEP 19 1958

Mr. E. W. Sawyer, Jr., Pres.
Sawyer Petroleum Company
Oatman, Arizona

Re: Docket No. DMEA5043 ~~(Thorium)~~
Sawyer Petroleum Company
Beaverhead County, Montana

Dear Mr. Sawyer,

As you have an application for exploration aid pending in our office, perhaps you may wish to study the proposed OME regulations and comment on them before October 17 as provided in the first paragraph of the enclosed notice reprinted from the Federal Register of September 17.

Some time after October 17 when the final regulations become effective, we will send you the new application form so you may furnish any additional information necessary to process your application for aid under the new program.

G. G. Witmeyer (Lw)

MGMKG Director

ASDakan:gjb
September 19, 1958
Copy to: Docket
Director's R. File
Field Team (2)

SAWYER PETROLEUM COMPANY
OATMAN, ARIZONA

Please address all correspondence to Los Angeles

PETROLEUM AND MINERAL EXPLORATION

LOS ANGELES OFFICE
650 SO. GRAND AVE.
LOS ANGELES 17, CALIF.

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 21 1958

DATE	INITIAL	CODE
8/21	N. T.	225
		700
"	Chung	
		225

August 19, 1958

Mr. C. O. Mittendorf
United States Department of the Interior
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No. DMEA-5043 (Thorium)
Last Chance, et al., Claims
Lemhi Pass District
Beaverhead County, Montana

Dear Mr. Mittendorf:

We are in receipt of your letter of August 15, informing us that our application for a D.M.E.A. loan could not be executed because of the ending of the program for exploration assistance.

We would appreciate it if you would keep the application on file and keep us advised as to any new developments in the legislative field which would provide funds for the continuation of exploration aid.

Yours very truly,

SAWYER PETROLEUM COMPANY

E. W. Sawyer, Jr.
President

EWS/hh

No reply necessary
MC.

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
8/15/58	Ching	700
8/15	Kuordsa	700
8/15	Gillingsgaard	130
8/15	Jones	130
8/15	Nelson	130
"	Jensen	110
	Mittendorf	100
		220
		225

AUG 15 1958

Mr. E. W. Sawyer, Jr., President
Sawyer Petroleum Company
650 South Grand Avenue
Los Angeles, California

Re: Docket No. DMEA-5043 (Thorium)
Last Chance, et al., Claims
Lemhi Pass District
Beaverhead County, Montana

Dear Mr. Sawyer:

Early in June we sent you the Department of the Interior Information Service Release dated June 6 which announced that no new Defense Minerals Exploration Administration contracts could be executed after June 30 because of the ending of the present program for exploration assistance.

We regret to inform you that your application, identified above, could not be completely processed before June 30 because it was received too late. However, we will be glad to hold your application pending enactment of legislation to continue exploration aid. If the aid is continued, we will then ask you to state whether you wish us to consider your application under regulations established for the new program.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

MChing/gla
8-15-58
cc to: Admr.'s Reading File
Operating Committee
THKiilsgaard, 5224
Mr. Ching
DMEA Field Team, Region I (2)

8623

Region I Report for July states that a contract will be recommended in this case.

Michael Ching

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
6/16/58	Ching	700
6/16	Moore	700
6/18	Selfridge	130
"	Osmun	110
"	Mittendorf	100
6/19	C	220
		700
6/18	Lamb	130
6/18	Gagnon	130

JUN 19 1958

Mr. E. W. Sawyer, Jr., President
Sawyer Petroleum Company
650 South Grand Avenue
Los Angeles, California

Re: Docket No. DMEA-5043 (Thorium)
Last Chance, et al., Claims
Lemhi Pass District
Beaverhead County, Montana

Dear Mr. Sawyer:

The application for assistance in exploring the subject property under the captioned docket number has been reviewed by the Division of Rare and Miscellaneous Metals.

The DMEA Field Team, Region I, Mr. A. E. Weissenborn, Executive Officer, South 157 Howard Street, Spokane 4, Washington, will make a field examination of your property if it has not already done so.

Any assistance you may give the members of the Field Team during the examination will be appreciated.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

MChing/gla
6-16-58
cc to: Admr.'s Reading File
Mr. Ching
DMEA Field Team, Region I (2)

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
6/16/58	Ching	700
6/16	Kuroda	700
6/18	GCS	130
"	Johnson	110
"	Wattenberg	100
		220
		700

JUN 19 1958

Mr. A. E. Weissenborn
Executive Officer
DMEA Field Team, Region I
South 157 Howard Street
Spokane 4, Washington

Re: Docket No. DMEA-5043 (Thorium)
Sawyer Petroleum Company
Last Chance, et al., Claims
Lemhi Pass District
Beaverhead County, Montana

Dear Mr. Weissenborn:

Reference is made to your letter of June 5, 1958, which states that a field examination of the subject property was scheduled during the week of June 9.

We will, therefore, hold this application in abeyance until the report and recommendations of the Field Team are received.

Enclosed are copies of memoranda, dated June 10 and June 11, 1958, from James Paone, USBM, and W. P. Williams, USGS, respectively. Also enclosed, for the use of the Field Team, are one copy each of the application and reports by Leonard D. Jarrard and Warren R. Wagner.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Enclosures

MChing/gla
6-16-58
cc to: Admr.'s Reading File
Operating Committee
THKiilsgaard, 5224
Mr. Ching

APPROVED:

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

Thor H. Kiilsgaard (THK)
Member, Geological Survey

8623

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

OFFICIAL FILE COPY
IN REPLY REFER TO:
DMEA
RECEIVED JUN 12 1958

DATE		CODE
6/12	C	220
6/13	Ellis	700
	Chrisy	

Memorandum

June 11, 1958

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

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

Subject: Review of application, DMEA 5043 (Thorium) Sawyer Petroleum Company, T. 10 S., R. 15 W., Lemhi Pass District, Beaverhead County, Montana

The applicant proposes to explore for thorium ore deposits on a large group of claims located about 120 miles south of Butte, Montana. The proposed work would consist of drifting, raising, drilling, bulldozing of surface outcrops, and mine rehabilitation. Total estimated cost of the project is $246,112.

The Executive Officer, DMEA Field Team Region I, points out that the property described in the present application includes the claims explored under the terms of Contract Idm-E144, DMEA docket 1168X. The area proposed for exploration under the present docket, however, lies farther west.

1186-

The applicant states that there are between 500,000 and 750,000 tons of indicated ore on the property that will assay from 0.60 percent to 1.00 percent thorium oxide.

In view of the considerable amount of work that has already been done on the property, it appears that the final evaluation of the claims should be arrived at through field examination. The Executive Officer states that a field examination will be scheduled the week of June 9, 1958.

W. P. Williams

W. P. Williams

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 11 1958

DATE	INITIALS	CODE
6/11	C	220
"	~~Ellis~~	700
	Chiang	

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

Date June 10, 1958

DMEA Docket No. 5043
DMEA Contract No.
Commodity Thorium
Name of Applicant Sawyer Petroleum Company
Name of Property T. 10 S., R. 15 W., P. M.
Location of property Beaverhead County, Montana
Estimated cost of project $200,000

Memorandum

To: Ernest William Ellis, DMEA Member ✓
Uranium Commodity Committee
From: James Paone, Bureau of Mines Member JP
Uranium Commodity Committee
Subject: Review of Application
(Application, Field Team Report, etc.)

1. Date of subject document: 6/5/58 2. Date received by reviewer: 6/9/58

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

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

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

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

7. Explain items marked "yes" above:

8. Factors meriting special consideration:

a. Location ☐
b. Ownership ☐
c. Evidence of mineralization ☐
d. Geology ☐
e. Proposed exploration method ☐
f. Alternate exploration method ☐
g. Costs
h. ☐

9. Action advised:

a. Obtain information from applicant ☐
b. Refer to Field Team ☒
c. Denial ☐
d. Agree with Field Team ☐
e. Disagree with Field Team ☐
f. Support alternate plan ☐
g. Request another consideration ☐
h. Approval ☐
i. Consult with Mr. _____ at _____ AEC Office

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

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

June 9, 1958

Sawyer Petroleum Company
Oatman, Arizona

Subject: DMEA-5043

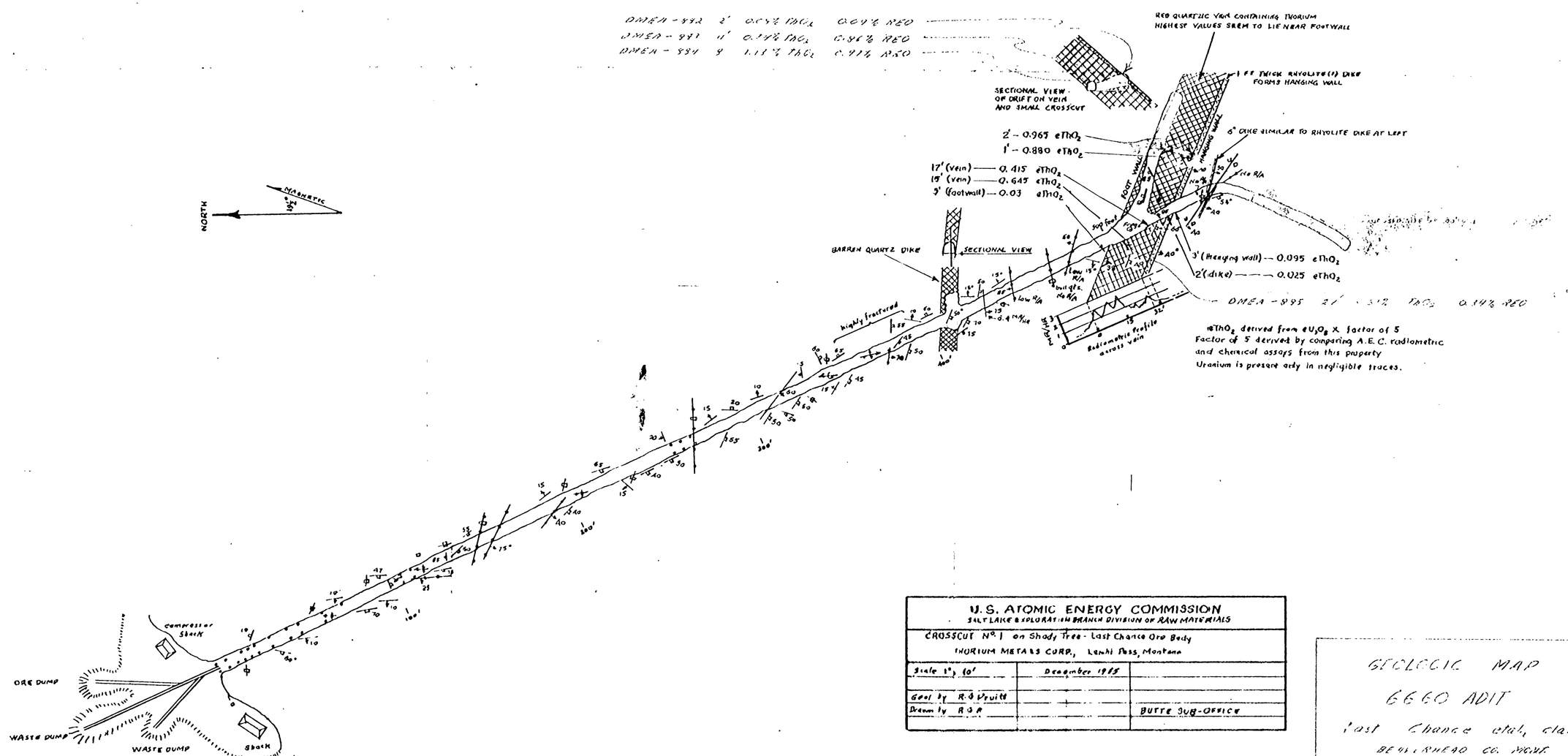
Gentlemen:

Your application for exploration assistance, dated May 5, 1958 submitted to our office at Spokane, Washington has been assigned Docket Number DMEA-5043 and referred to the Rare and Miscellaneous Metals Division in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

Allen S. Dakan, Director
Operations Control and
Statistics Division

Copy to: Region I.



U.S. ATOMIC ENERGY COMMISSION SALT LAKE EXPLORATION BRANCH DIVISION OF RAW MATERIALS		
CROSSCUT No. 1 on Shady Tree - Last Chance Ore Body THORIUM METALS CORP., Lemhi Pass, Montana		
Scale 1" = 10'	December 1955	
Geol by R.G. Pruitt		
Drawn by R.G.R.		BUTTE SUB-OFFICE

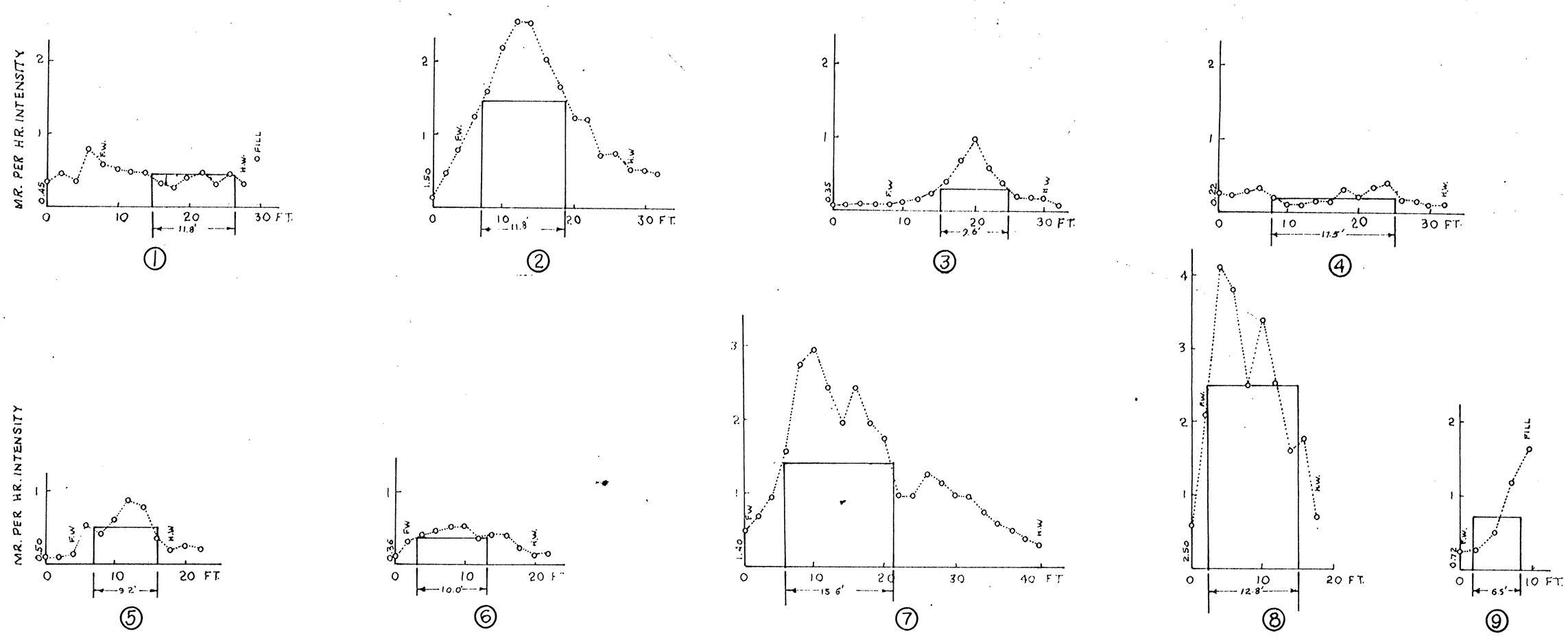
GEOLOGIC MAP
6660 ADIT
Last Chance Otab. Claims
BEAVERHEAD CO. MONT.

0 50 10 80 FEET

Copied with modifications from map submitted by applicant.
COPY TRACED: J.S.H. 5-5-58

July, 1958

Plate 3



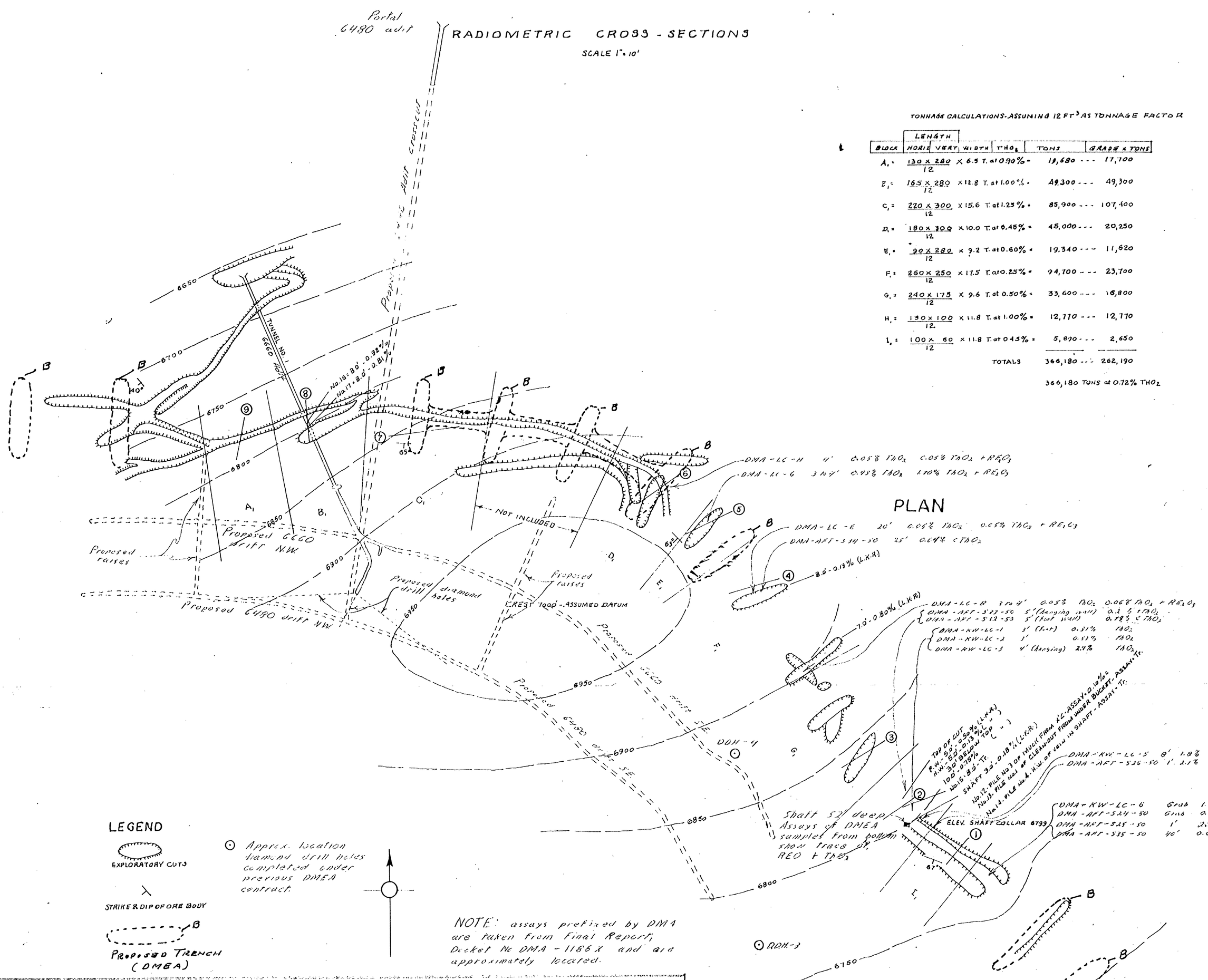
RADIOMETRIC CROSS - SECTIONS

SCALE 1" = 10'

TONNAGE CALCULATIONS-ASSUMING 12 FT³ AS TONNAGE FACTOR

BLOCK	LENGTH HORIZ	LENGTH VERT	WIDTH	THO₂	TONS	GRADE x TONS
A₁ =	130 x 280 / 12		X 6.5 T.	at 0.90% =	18,680 ---	17,700
B₁ =	165 x 280 / 12		X 12.8 T.	at 1.00% =	49,300 ---	49,300
C₁ =	220 x 300 / 12		X 15.6 T.	at 1.25% =	85,900 ---	107,400
D₁ =	180 x 300 / 12		X 10.0 T.	at 0.45% =	45,000 ---	20,250
E₁ =	90 x 280 / 12		X 9.2 T.	at 0.60% =	19,340 ---	11,620
F₁ =	260 x 250 / 12		X 17.5 T.	at 0.25% =	94,700 ---	23,700
G₁ =	240 x 175 / 12		X 9.6 T.	at 0.50% =	33,600 ---	16,800
H₁ =	130 x 100 / 12		X 11.8 T.	at 1.00% =	12,770 ---	12,770
I₁ =	100 x 60 / 12		X 11.8 T.	at 0.45% =	5,890 ---	2,650
TOTALS					366,180 ---	262,190

366,180 TONS at 0.72% THO_2



Composite Map and Radiometric Profiles

LAST CHANCE - SHADY TREE ORE BODY

BEAVERHEAD COUNTY, MONTANA

SCALE, 1" = 100'

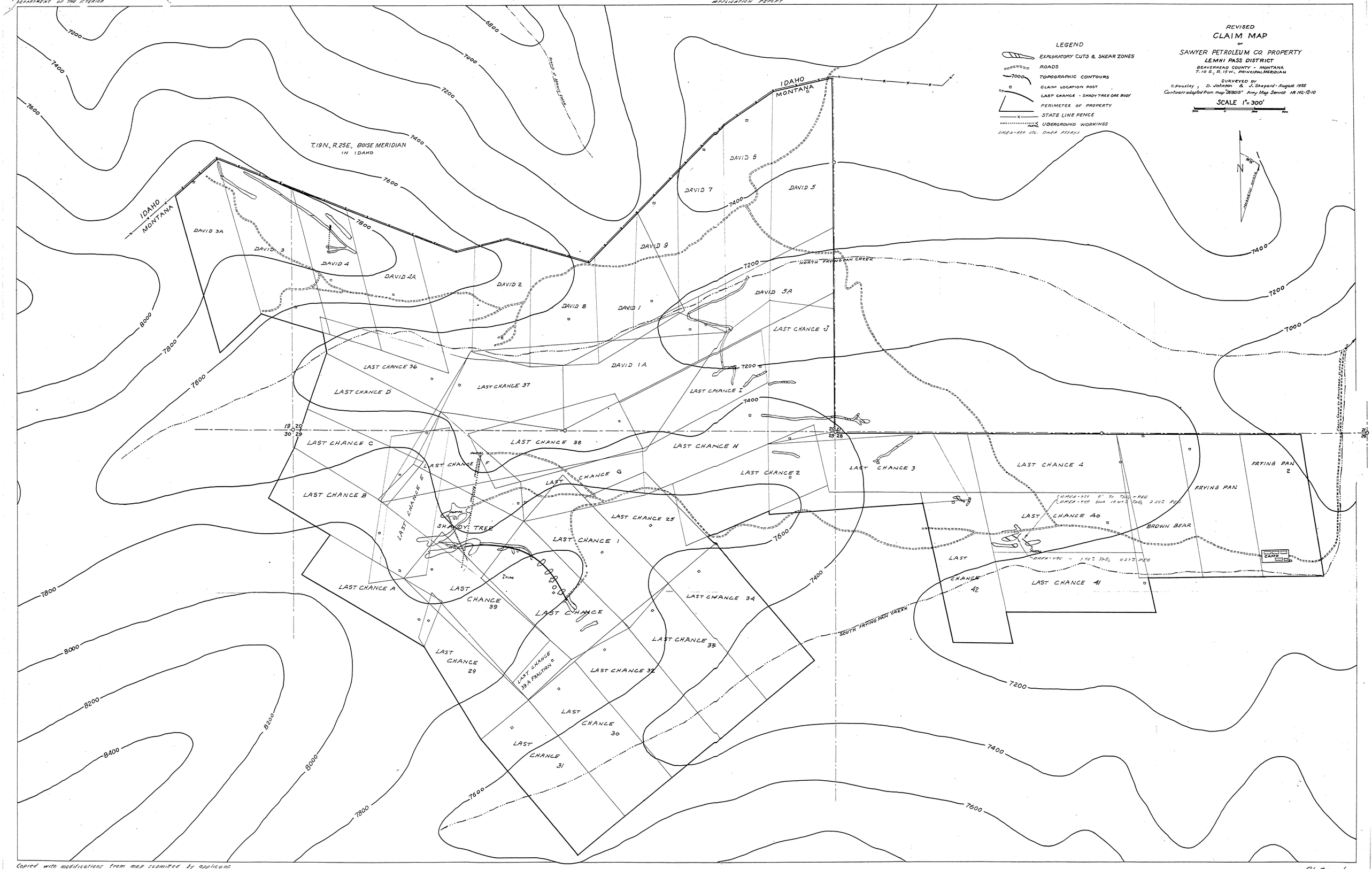
100 50 0 100 200 300 400 FEET

July 1958

Plate 2

TRACED FROM METALS CORP. WHITE PRINT BY U.S.A.B.C. BUTTE SUB-OFFICE OCT. 1955

Copied with modifications from maps submitted by applicant.



Copied with modifications from map submitted by applicant.

Plate 1