MINING LEASE

THIS LEASE, made and entered into this 20th day of March, 1970, by and between FIRST STATE BANK OF ELIZABETHTOWN, Hardin County, Illinois, owner of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all those certain mining properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The East Half (E-½) of the North East Quarter (NE-¼) of Section Twenty-five (25), Township Eleven South (T 11 S), Range Seven East (R 7 E) of the third Principal Meridian; And the West Half (W-½) of the North West Quarter (NW-¼) of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E) of the Third Principal Meridian, and containing in the aggregate one hundred sixty (160) acres, more of less.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, including oil and gas, in, upon and underlying said lands, together with all rights and privileges apertaining thereto.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mineral properties are free and clear from any right or claim of any other person or persons.

If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other consideration herein provided for shall be paid by Lessee only in the proportion the Lessor's interest bears to the whole and undivided mineral estate.

First State Bank

2. TERM. The primary term of this lease shall be for a period of ten (10) years from the date hereof. This lease may be extended beyond the primary term and for so long thereafter as Lessee expends the sum of Two Thousand Dollars ($2,000) per year in mining, development, exploration or prospecting upon any of the said mining properties, provided that after the primary term the production royalties paid must be equal to double the minimum royalty as hereinafter provided.

3. RENTS AND ROYALTY. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows;

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value of $20.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding $22.00/ton.

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

4. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor, as advance or minimum royalties, Five Hundred ($500.00) per year on the above described properties. The first payment shall be due within thirty (30) days after the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease. In the event Lessee fails to pay the advance or minimum royalty within sixty (60) days after due, this lease is cancelled without any further notice due Lessee from Lessor.

5. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any minimum or advance royalties shall be credited

against any future production royalties that may come due and owing only during the primary term of this lease.

6. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

7. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

8. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

9. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

10. TERMINATION. Lessee may cancel or terminate this lease upon (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of maney paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

11. DEFAULT. If Lessee fails, refuses or neglects to perform the terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing, to rectify such default, Lessor or his agents may reenter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

12. ASSIGNMENT. All parties hereto agree and understand that all the rights of either party hereto may be assigned, and the privilege of assigning or subletting in whole or in part is expressly allowed, and all the covenants and agreements hereunder shall inure to, continue and be binding upon the heirs, legal representatives, successor and assigns of the parties hereto, but no change in the ownership of the land or assignment of royalties shall be binding on the Lessee until after the Lessee has been furnished with a written, recorded transfer or assignment, or a true copy thereof.

13. NOTICE. Any notice required to be given to Lessor hereunder shall be given to him by registered mail addressed to him at Elizabethtown, Illinois, or at such other address or addresses as he respectively may hereafter designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

14. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all State mining laws.

15. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

16. LIABILITY AND NON-RESPONSIBILITY. Lessee will indemnify and hold Lessor harmless from and against all liability, claims, demands, injuries or damage done to persons or property caused by or in connection with its use of the above described premises and facilities, and the loading, hauling, and handling of the crude or finished product from the said premises, and all activities thereunder related, and Lessee shall, at his own expense, defend any and all actions based thereon and shall pay all charges of attorneys and all costs and other expenses arising therefrom.

17. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

18. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

19. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

20. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

21. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

INDUSTRIAL MINERALS EXPLORATION COMPANY

By _____
A General Partner

LESSOR:

FIRST STATE BANK OF ELIZABETHTOWN

By _____
President

By _____
Cashier

STATE OF ILLINOIS)
) ss.
COUNTY OF HARDIN)

On the 26th day of March, 1970, before me, a Notary Public, personally appeared Tom Patton and Jack Holbrook, known to me to be the president and cashier, respectively, of the First State Bank of Elizabethtown, Illinois, the corporation that executed the within instrument, known to me to be the persons who executed the within instrument on behalf of the corporation therein named and acknowledged to me that such corporation executed the same.

My commission expires: July 4, 1972

Florence F. Lozyk
Notary Public in and for said County and State

STATE OF NEW YORK)
) ss
COUNTY OF New York)

On the 13th day of April, 1970, before me, a Notary Public, personally appeared John L. Carroll, personnally known to me to be a general partner of Industrial Minerals Exploration Company, the limited partnership described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Industrial Minerals Exploration Company.

Robert A. Koch
Notary Public in and for said County and State

My commission expires:

ROBERT A. KOCH
NOTARY PUBLIC, State of New York
No. 30-2163512
Qualified in Nassau County
Certificate Filed in New York County
Commission Expires March 30, 1971

ASSIGNMENT

In consideration of the premises and for other good and valuable consideration, the receipt of which is hereby acknowledged, INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, having its principal place of business at 345 Park Avenue, New York, New York 10022, does hereby sell, transfer and assign to ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York 10022, its entire right, title and interest as Lessee under the Mining Lease dated March 20, 1970 between FIRST STATE BANK OF ELIZABETHTOWN, Hardin County, Illinois, as Lessor, and INDUSTRIAL MINERALS EXPLORATION COMPANY as Lessee, of the property containing one hundred sixty (160) acres, more or less, in Hardin County, Illinois, more particularly described as follows:

> The East Half (E 1/2) of the North East Quarter (NE 1/4) of Section Twenty-five (25), Township Eleven South (T 11 S), Range Seven East (R 7 E) of the third Principal Meridian; And the West Half (W 1/2) of the North West Quarter (NW 1/4) of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E) of the Third Principal Meridian, and containing in the aggregate one hundred sixty (160) acres, more or less.

Dated: New York, New York
January 20, 1971

INDUSTRIAL MINERALS EXPLORATION

By _____
General Partner

MINING LEASE

THIS LEASE, made and entered into this 30th day of July, 1971, by and between ETTA IRBY, a widow never having remarried, and ILEY "DOC" PANKEY, a single man never having been married, both of Rural Route, Elizabethtown, Illinois, hereinafter referred to as "Lessor", and ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York, 10022, hereinafter referred to as "Lessee";

WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all of those certain mineral properties and mining rights belonging to Lessor, situated in Hardin County, State of Illinois, to-wit:

The North East Quarter of the North West Quarter (except a parcel described as follows: Commencing at the southeast corner of said forty acre tract and from thence running north a distance of one hundred ten (110) feet to a pointwhereon the south right of way line of the Church Public Road entering from the Hicks Town Elizabethtown Gravel Public Road intersecting the division line between the North West Quarter of the North East Quarter and the North East Quarter of the North West Quarter and from thence running west twelve degrees (12°) south a distance of one hundred eighty-six and five-tenths (186.5) feet along the south right of way line of said Church Public Road to a point whereon said south right of way line intersects the east right of way line of the Public Gravel Hicks Town, Elizabethtown Road, and from thence running in a general southeasterly direction along the course of the east right way line of the Public Gravel Hicks Town Elizabethtown Road to a point whereon said east right of way line intersects the division line between the North East Quarter and the South East Quarter of the North West Quarter and from thence running east along the last above mentioned division line a distance of ninety-three and five-tenths (93.5) feet to the point of beginning, containing thirty-one one-hundredths (.31) acres);

The South East Quarter of the North West Quarter (except a parcel discribed as follows: Commencing at the northeast corner of the South East Quarter of the North West Quarter and running west a distance of ninety-three and five-tenths (93.5) feet along the division line between the South East Quarter and the North East Quarter of the North West Quarter to a point whereon said division line intersects the east right of way line of the Public Gravel Road running from Hicks Town to Elizabethtown, and from thence running in a general southeasterly direction along the course of the east right of way line of said gravel road a distance of one hundred fifty-six (156) feet to a point whereon

said east right of way line intersects the division line between the East and West Halves of the North Half of Section Thirty (30) and from thence running north on last above mentioned division line a distance of one hundred thrity-seven and five-tenths (137.5) feet to the point of beginning, containing one hurdred forty-seven one-thousandths (.147) acre),

all in Section Thirty (30) Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian, containing in the aggregate seventy-nine and five hundred forty-three thousandths (79.543) acres, more or less, (except such part of the real estate above described used as public roads).

It being the intention of Lessor to include any additional interests they might acquire in the future, by any means, in the hereinabove described real estate.

Lessee agrees to conduct no mining, drilling explorations, sinking of shafts or tunnels, or any mining whatsoever on the property situated northeast of the Hickstown-Elizabethtown gravel road.

WHEREAS, Lessee is interested in securing the entire andexclusive right to prospect for, mine, logwash and otherwise prepare for market any and all minerals and mineral substances of every kind and nature, in, on and beneath and underlying the above described real estate; and

WHEREAS, Lessor desires to have such minerals and mineral substances mined from said premises as above stated, and Lessee desires the right and privilege of entering upon said premises and working the same by use of suitable machinery, equipment, fixtures and buildings for mining and milling and related purposes which Lessee may desire to place upon the premises, and mining and recovering from said premises minerals and mineral substances for the purpose of sale and in the exploitation and determination of the possibilities of obtaining such mineral and mineral substances, and the same is agreeable to Lessor;

NOW, THEREFORE, in consideration of the sum of One Dollar ($1.00) and other valuable considerations paid or to be paid by the Lessee to the Lessor, and the mutual covenants to be kept and performed by the parties hereto as hereinafter expressed, the Lessor hands and by these presents do give and grant to said Lessee the exclusive right to enter upon said premises for the purpose of removing said minerals and mineral substance, erecting building to be used in connection, either directly or indirectly, with the operations of Lessees upon the above premises, installing machinery, tipples, sinking shafts, drifting, drilling, stripping, removing overburden or using any and all methods known to the science of mining, milling, refining or otherwise preparing ore minerals and mineral substance for market, and the exclusive right to so conduct prospecting, mining, milling and related operations upon the described premises, together with the right of ingress and egress and to build and construct over and across said lands, roads, trams and other means of conveyance for the purpose of transporting ore, minerals or other valuable mineral substances found thereon or thereunder, together with the right to use any water found on the property for any use related to the aforementioned purposes.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of said mining properties free and clear of any right or claim of any other person whatsoever, and that each and all of said claims and rights of Lessor as owner are now valid and subsisting.

In the event the Lessee is required to make any payment to any person or persons or to pay any reasonable legal fees in connection with perfection of title of Lessor to said mining properties, said sums shall be deducted from any amounts due Lessor under the terms of this lease. If Lessor owns a less interest in the above described land or any part thereof than the entire and undivided mineral estate, then the royalties and other considerations herein provided for shall be paid the Lessor only in the proportion which his interests bear to the whole and undivided fee of that portion of the leased premises from which the ore is extracted.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mining properties are free and clear from any right or claim of any other person.

2. TERM: The term of this lease shall be for a period of ~~Ten~~ Five ~~(10)~~ years from the date hereof and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of the said mining properties, said term commencing on the day and year first above mentioned.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the afore-described properties. The percentage royalty paid to Lessor shall be as follows;

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value of $20.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding $22.00/ton.

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

It is understood that the above cited percentage royalties are for the entire mineral estate and payment to Lessors cited herein will be prorated according to their interests in said mineral estate.

4. RECORDS. Lessee agrees to keep a full, true and accurate record showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this lease and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

7. INSURANCE. Lessee hereby agrees to carry adequate workmens conpensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon ten (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each month as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises, provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

10. ASSIGNMENT. This Lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be solely responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or liabilities under this lease and agreement, and Lessee shall proportionately be relieved of any or all of said obligations or liabilities.

11. NOTICE. All rents and royalties to be paid to the Lessor under paragraph 3 and 21 of the Lease, ~~any notice of cancellation or termination under paragraph 8 of the Lease, any notice to the Lessor under paragraph 22,~~ shall be mailed in the case of rents and royalties and sent by registered mail in the case of notices to the HARRISBURG NATIONAL BANK, Harrisburg, Illinois, Attention: Mr. Davenport, or any other such address or addresses as Lessor may designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at any other such address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all state mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restriction of orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatso ever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

19. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

20. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

21. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor as advance or minimum royalties, the sum of FIVE HUNDRED-----DOLLARS ($500.00) per year for the entire mineral estate, for each year that this lease is in force and effect. The first payment is to be made within ten days of the signing date of this lease; subsequent payments due are to be made on or before the tenth day of each month.

22. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any advance or minimum royalty shall be credited to earned royalty, and earned royalty shall be credited to minimum royalty, during the year, but no minimum royalty payment shall be credited to earned royalty other than for the year in which said minimum royalty is paid.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

ANTAEUS RESOURCES CORPORATION

By John L. Carroll
John L. Carroll
Vice-President-Mining

LESSOR:

Etta Irby
Etta Irby

Iley Pankey
Iley "Doc" Pankey

STATE OF Illinois)
) ss
COUNTY OF Hardin)

On the 30th day of July, 1971, before me, a Notary Public, personnaly appeared Etta Irby and Iley Pankey, both of Rural Route, Elizabethtown, Illinois, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed same.

Ida L Patton
Notary Public in and for said County and State

My commission expires:

4-11-72

STATE OF NEW YORK)
) ss
COUNTY OF NEW YORK

On the 4th day of August, 1971, before me, a Notary Public, personnally appeared John L. Carroll, personally known to me to be a Vice-President of Antaeus Resources Corporation, the corporation described in and which executed the foregoing instrument, and he acknowledged that executed the same as the act and deed of Antaeus Resources Corporation.

Notary Public in and for said County and State

JOHN J. TRACK JR.
Notary Public, State of New York
No. 31-4124 [illegible]
Qualified in New York County
Commission Expires March 30, 19[illegible]

My commission expires:
4-11-72

STATE OF ILLINOIS, } ss. No. 5179
Hardin County

This instrument was filed for record in the Recorder's Office of Hardin County aforesaid, on the 26 day of Aug A. D. 1971 at 11:00 o'clock A.M., and recorded in Book 9 of Misc on page 66.

Luther Sheridan
Recorder

Recording Fee

MINING LEASE

THIS LEASE, made and entered into this 12th day of March, 1970, by and between FLORENCE F. LOYD, a widow, FLUORINE LOYD, a widow, S. D. LOYD and BEULAH LOYD, his wife, MARYBELLE L. McLIN and W. R. McLIN, her husband, owners of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms, and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all those certain mineral properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The South West Quarter of the North East Quarter of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E), except a piece of land described as follows: Beginning at a point twelve (12) rods south of the northwest corner of said forty acre tract, thence running south twenty (20) rods, thence east twelve (12) rods to the road ditch, thence in a northwesterly direction with said ditch to a point directly east of the place of beginning, thence west to the place of beginning.

It is expressly understood and agreed by both parties that this MINING LEASE suceeds, amends, and takes the place of the MINING LEASE made between the parties hereto and executed on the 12th day of August, 1963, same being recorded on page 38, Book 7 of Miscellaneous in Recorder's Office of the Hardin County Courthouse, Elizabethtown, Illinois.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, except the oil and gas beneath and underlying the north half of said forty acre tract, in, upon and underlying said lands, together with all rights and privileges necessary for mining, milling, treating, storing and removing the same, including full rights of ingress and egress over and across said lands.

In the event the Lessee is required to make any payment to any person or persons or to pay any reasonable legal fees in connection with perfection of of title of Lessor to said mining claims, said sums shall be deducted from any amounts due Lessor under the terms of this agreement. If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other considerations herein provided for shall be paid by Lessee only in the proportion that Lessor's interest bears to the whole and undivided mineral estate.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mining properties are free and clear from any right or claim of any other person.

2. TERM. The term of this lease shall be for a period of Ten (10) years from the date hereof and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of the said mining properties.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows;

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value of $20.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding--$22.00/ton

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

4. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workman and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

7. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon ten (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each month as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

10. ASSIGNMENT. This lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be soley responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or liabilities under this lease and agreement, and Lessee shall proportionately be relieved of any or all of said obligations or liabilities.

11. NOTICE. All rents and royalties to be paid ~~by~~ to the Lessor under paragraph 3 of the Lease, any notices of cancellation or termination under paragraph 9 of the Lease, any notices to be given to Lessor under paragraph 11 of the Lease, shall be mailed, in the case of rents and royalties, and sent by registered mail in the case of notices to the HARRISBURG NATIONAL BANK, Harrisburg, Illinois, Attention: Mr. Davenport.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all State mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered; waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

19. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

20. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

21. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor advance or minimum royalties of two hundred forty dollars ($240.00) for each year as long as this lease is in force.

The payment for the first year is to be made within thirty (30) days of the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease.

22. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any minimum royalty shall be credited to earned royalty during the year, but no minimum royalty payment shall be credited to earned royalty other than for the year in which said minimum royalty is paid.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

INDUSTRIAL MINERALS
EXPLORATION COMPANY

By _____
A General Partner

LESSOR:

_____

_____

_____

_____

_____

_____

_____

STATE OF ILLINOIS)
) ss.
COUNTY OF HARDIN)

On the 25th day of March, 1970, before me a Notary Public, personally appeared FLORENCE F. LOYD, a widow, and ~~T. W. LOYD~~ and FLUORINE LOYD, ~~husband and wife~~, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same.

Larry D. Pittman
Notary Public in and for said County and State

My commission expires:
12-30-72

STATE OF Kentucky)
) ss.
COUNTY OF Marshall)

On the 12 day of March, 1970, before me a Notary Public, personally appeared S. D. LOYD and BEULAH LOYD, husband and wife, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same.

William C. Lighton
Notary Public in and for said County and State

My commission expires:
7-26-71

STATE OF Oregon)
) ss.
COUNTY OF Marion)

On the 20th day of March, 1970, before me, a Notary Public, personally appeared MARYBELLE L. McLIN and W. R. McLIN, her husband, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same.

Robt. Brown
Notary Public in and for said County and State

My commission expires:
My Commission Expires April 27, 1971

STATE OF NEW YORK)
) ss.
COUNTY OF NEW YORK)

On the 16th, day of April, 1970, before me, a Notary Public, personally appeared JOHN L. CARROLL, personally known to me to be a general partner of Industrial Minerals Exploration Company, the limited partnership described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Industrial Minerals Exploration Company.

Robert A Koch
Notary Public in and for said County and State

My commission expires:

ROBERT A. KOCH
NOTARY PUBLIC, State of New York
No. 30-2163512
Qualified in Nassau County
Certificate Filed in New York County
Commission Expires March 30, 1971

ASSIGNMENT

In consideration of the premises and for other good and valuable consideration, the receipt of which is hereby acknowledged, INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, having its principal place of business at 345 Park Avenue, New York, New York 10022, does hereby sell, transfer and assign to ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York 10022, its entire right, title and interest as Lessee under the Mining Lease dated March 12, 1970 between FLORENCE F. LOYD, a widow, FLUORINE LOYD, a widow, S.D. LOYD and BEULAH LOYD, his wife, and MARYBELLE L. McLIN, and W.R. McLIN, her husband, as Lessor, and INDUSTRIAL MINERALS EXPLORATION COMPANY as Lessee, said Mining Lease having succeeded, amended and replaced a Mining Lease made between and executed by the parties on August 12, 1963, and recorded on page 38, Book 7 of Miscellaneous in the Recorder's Office at the Hardin County Courthouse, Elizabethtown, Illinois, of the property in Hardin County, Illinois, more particularly described as follows:

> The South West Quarter of the North East Quarter of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E), except a piece of land described as follows: Beginning at a point twelve (12) rods south of the northwest corner of said forty acre tract, thence running south twenty (20) rods, thence east twelve (12) rods to the road ditch, thence in a northwesterly direction with said ditch to a point directly east of the place of beginning, thence west to the place of beginning.

Dated: New York, New York
January 20, 1971

INDUSTRIAL MINERALS EXPLORATION

By _____
General Partner

STATE OF NEW YORK)
) SS.:
COUNTY OF NEW YORK)

On this 20th day of January, 1971, before me personally appeared John Lee Carroll, personally known to me to be a General Partner of Industrial Minerals Exploration Company, a limited partnership having its principal place of business at 345 Park Avenue, New York, New York 10022, and who executed the foregoing assignment, and duly acknowledged to me that he executed the same as the act and deed of said partnership.

_____
Notary

MINING LEASE

THIS LEASE, made and entered into this 18th FEB. day of February, 1972, by and between WILLIAM L. HAMP and APPLENA HAMP, his wife, of 3724 Windona Way, North Highlands, California, 95660, JAMES E. HAMP and DIANE K. HAMP, his wife, of 2920 Greenwood Avenue, Sacramento, California, 95821 and FRANKLIN E. HAMP and MARY H. HAMP, his wfie, of 6918 Larsen Lane, Shawnee Mission, Kansas, hereinafter referred to as "Lessor", and ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York, 10022, hereinafter referred to as "Lessee";

WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all of those certain mineral properties and mining rights including oil and gas belonging to Lessor, situated in Hardin County, State of Illinois, to-wit:

> The N1/2 of the NW1/4 of the SW1/4 and a part of the E1/2 of the SW1/4 described by metes and bounds as follows:
> Beginning at the NW corner of the said E1/2 of the SW1/4, thence running South with the West line thereof to the center point of the West line of the SE1/4 of the SW1/4, being the NW corner of the Silas Stacy tract, thence East 40 rods, thence North to a point 30 rods North of the North line of the SE1/4 of the SW1/4, thence East 33 rods to the West line of the Pleas Rose tract, thence, North to the North line of the said E1/2 SW1/4, thence West to the place of beginning, all in Section 30, Township 11 South, Range 8 East of the Third Principal Meridian, containing in the aggregate, 61 1/2 acres, more or less,

together with all land or interests owned by Lessor adjoining or contiguous to the land above described, whether in the same or different surveys, but limited to the rights now owned by Lessor.

WHEREAS, Lessee is interested in securing the entire and exclusive right to prospect for, mine, logwash and otherwise prepare for market any and all minerals and mineral substances of every kind and nature, in, on and beneath and underlying the above described real estate; and

WHEREAS, Lessor desires to have such minerals and mineral substances mined from said premises as above stated, and Lessee desires the right and privilege of entering upon said presmies and working the same by use of suitable machinery, equipment, fixtures and buildings for mining and milling and related purposes which Lessee may desire to place upon the premises, and mining and recovering from said premises minerals and mineral substances for the purpose of sale and in the exploitation and determination of the possibilities of obtaining such mineral and mineral substances, and the same is agreeable to Lessor;

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character in, upon and underlying said lands together with all rights and privileges necessary for mining, milling, treating, storing and removing the same, including the full rights of ingress and egress over and across said lands, it being specifically understood by Lessee and Lessor that the rights covered herein are limited to those owned by Lessor on the date of this Mining Lease.

If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other considerations herein provided for shall be paid by Lessee only in the proportion that Lessor's interest bears to the whole and undivided mineral estate.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mining properties are free and clear from any right or claim of any other person.

2. TERM. The term of this lease shall be for a period of Ten (10) years, commencing on January 1, 1972 and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of the said mining properties.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows:

5%-for ores having a "net proceeds" value of $0.00 --$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
10%-for ores having a "net proceeds" value of $18.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding--$22.00/ton

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty production payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

In the case of oil and gas, the royalties reserved by Lessor, and which shall be paid by Lessee are one-eighth (1/8th) of that produced and saved from the leased premises, the same to be delivered at the wells or to the credit of Lessor in the pipeline to which the wells may be connected.

4. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of the Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items with the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

7. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon Thirty (30) days' notice in writing to that effect mailed to Lessor as Provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Leesor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and character which the Lessor may have against the Lessee.

Lessee further agrees that if and when this Mining Lease is terminated, he will furnish Lessor, free of charge and without any interpretation, implied or otherwise, a copy of a map showing the location of drill holes, logs of any such drill holes and geologic, geochemical and geophysical maps made by him.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each year as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be tained as rental for the use and occupation of said premises by Lessee, and thereupon with Ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the Attorney for the Lessor.

10. ASSIGNMENT. This lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be soley responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or liabilities under this lease and agreement, and Lessee shall proportionately be relieved of any or all of said obligations or liabilities.

11. NOTICE. All rents and royalties to be paid to the Lessor under paragraphs 3 and 21 of the Lease, any notices of cancellation or termination under paragraph 9 of the Lease, any notices to be given to Lessor under paragraph 11 of the Lease, shall be mailed in the case of rents and royalties and sent by registered mail in the case of notices to the addresses of Lessors as hereinabove first written.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all State mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions or orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operation hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

19. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

20. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

21. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor advance or minimum royalties of ~~ONE~~ TWO THOUSAND ~~AND FIVE~~ SIX HUNDRED ~~DOLLARS~~ SIXTY DOLLA ($2,160.00) ~~($1,500.00)~~ per year for each year as long as this lease is in force. The payment for the first year is to be made within thirty (30) days of the signing date of this lease; subsequent payments are to be made on or before the first day of each succeeding year.

22. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any minimum royalty shall be credited to earned royalty during the year, but no minimum royalty payment shall be credited to earned royalty other than for the year in which said minimum royalty is paid.

23. WORK COMMITMENTS. Lessee agrees that during the term of this Mining Lease, and to keep this Lease in force and effect, he will spend or cause to be spent, an average minimum of TWO THOUSAND DOLLARS ($2,000.00) per year on the subject properties, said sums to be spent on drill holes or other exploration work. Amounts spent in any one year exceeding TWO THOUSAND DOLLARS ($2,000.00) may be applied by Lessee to requirements for succeeding years.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

ANTAEUS RESOURCES CORPORATION

By John L. Carroll
John L. Carroll
Vice President

LESSOR:

James E. Hamp
James E. Hamp

Diane K. Hamp
Diane K. Hamp

William L. Hamp
William L. Hamp

Applena Hamp
Applena Hamp

Mary H. Hamp
Mary H. Hamp

Franklin E. Hamp
Franklin E. Hamp

STATE OF NEW YORK)
) ss
COUNTY OF NEW YORK)

On the 29th day of February, 1972, before me, a Notary Public, personnally appeared John L. Carroll, personally known to me to be a Vice-President of Antaeus Resources Corporation, the corporation described in and which executed the foregoing instrument, and he acknowledged that executed the same as the act and deed of Antaeus Resources Corporation.

Notary Public in and for said County and State

My commission expires:

STATE OF California)
) ss
COUNTY OF Sacramento)

On the 16th day of February, 1972, before me, a Notary Public personally appeared James E. Hamp and Diane K. Hamp

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

SYDNEY R. JOHNSON
NOTARY PUBLIC
STATE OF CALIFORNIA
PRINCIPAL OFFICE IN SACRAMENTO
MY COMMISSION EXPIRES FEB. 27, 1973

Notary Public in and for said County and State

My commission expires:
February 27, 1973

STATE OF CALIFORNIA)
) ss
COUNTY OF YOLO)

On the 15th day of February, 1972, before me, a Notary Public personally appeared WILLIAM L. HAMP and ADRIENNE HAMP, his wife

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

Notary Public in and for said County and State

My commission expires:
November 21, 1973.

MARCIA J. MAXWELL
NOTARY PUBLIC
YOLO COUNTY, CALIFORNIA
My commission expires November 21, 1973

STATE OF Missouri)
) ss
COUNTY OF Jackson)

On the 18th day of February, 1972, before me, a Notary Public personally appeared Mary H. Hamp and Franklin E. Hamp

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

Shirl Hamilton
Notary Public in and for said County and State

My commission expires:
February 15, 1974

STATE OF)
) ss
COUNTY OF)

On the _____ day of _____, 197___, before me, a Notary Public personally appeared _____

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

Notary Public in and for said County and State

My commission expires:

STATE OF)
) ss
COUNTY OF)

On the _____ day of _____, 197___, before me, a Notary Public personally appeared _____

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

Notary Public in and for said County and State

My commission expires:

Signature

R.O.W. to file

MINING LEASE

THIS LEASE, made and entered into this 14 day of April, 1970, by and between LOLA EWELL FREDRICKS and JACK L. FREDRICKS, her husband, and SOPHIA COY, owners of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, hereinafter referred to as "Lessee";

WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all of those certain mineral properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The North Half of the South West Quarter and the South Half of the North West Quarter of the South West Quarter, all in Section Thirty (30), Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian, containing in the aggregate forty (40) acres, more or less.

1.. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of said mining properties free and clear of any right or claim of any other person whatsoever, and that each and all of said claims and rights of Lessor as owner of each and all of said mining properties are now valid and subsisting.

In the event the Lessee is required to make any payment to any person or persons or to pay any reasonable legal fees in connection with perfection of title of Lessor to said mining claims, said sums shall be deducted from any amounts due Lessor under the terms of this agreement. If Lessor owns a less interest in the above described land or any part thereof than the entire and undivided fee simple estate, then the royalties and other consideration herein provided for shall be paid the Lessor

only in the proportion which his interests bear to the whole and undivided fee of that portion of the leased premises from which the ore is extracted.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mining properties are free and clear from any right or claim of any other person.

2. TERM. The term of this lease shall be for a period of Ten (10) years from the date hereof and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of the said mining properties.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows;

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value of $20.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding--$22.00/ton

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

4. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workman and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

7. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon ten (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents

and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each month as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possission of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

10. ASSIGNMENT. This lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be soley responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or liabilities under this lease and agreement, and Lessee shall proportionately be relieved of any or all of said obligations or liabilities.

11. NOTICE. Any notice required to be given to Lessor hereunder shall be given to him by registered mail addressed to him at: 2007 Mass St.
Eugene, Oregon 97403
or at such other address or addresses as he respectively may hereafter designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all State mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

19. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

20. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

21. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor advance or minimum royalties of Eighty Dollars ($80.00) for each year as long as this lease is in force. The payment for the first year is to be made within thirty (30) days of the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease.

22. CREDIT AGAINST FUTURE PRODUCTION. It is understood

and agreed that any advance or minimum royalties paid to Lessor by Lessee may be credited by Lessee against future royalties payable to the Lessor based upon production and sale of ore.

23. OIL AND GAS ROYALTIES. The Lessee agrees to pay to Lessor in a manner as herein provided, a royalty of twelve and one-half percent (12½%) of net proceeds received from the sale of oil and gas.

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

LESSEE:

INDUSTRIAL MINERALS
EXPLORATION COMPANY

By _____
A General Partner

LESSOR:

Mrs. Emell Fredricks

Jack G. Fredricks

_____

_____

STATE OF Arizona)
) ss.
COUNTY OF Maricopa)

On the 14th day of April, 1970, before me, a Notary Public, personally appeared LOLA EWELL FREDRICKS and JACK L. FREDRICKS known to me to be the persons whose names subscribed to the within instrument, and acknowledged that they executed the same.

[illegible]
Notary Public in and for said
County and State

My Commission Expires Nov. 7, 1971

STATE OF)
) ss.
COUNTY OF)

On the _____ day of _____, 1970, before me, a Notary Public, personally appeared SOPHIA COY known to me to be the person whose name subscribed to the within instrument, and acknowledged that she executed the same.

Notary Public in and for said
County and State

STATE OF)
) ss.
COUNTY OF)

On the _____ day of _____, 1970, before me, a Notary Public, personally appeared JOHN L. CARROLL, personally known to me to be a general partner of Industrial Minerals Exploration Company, the limited partnership described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Industrial Minerals Exploration Company.

Notary Public in and for said
County and State

ASSIGNMENT

In consideration of the premises and for other good and valuable consideration, the receipt of which is hereby acknowledged, INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, having its principal place of business at 345 Park Avenue, New York, New York 10022, does hereby sell, transfer and assign to ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York 10022, its entire right, title and interest as Lessee under the Mining Lease dated April 14, 1970 between LOLA EWELL FREDRICKS and JACK L. FREDRICKS, her husband, and SOPHIA COY as Lessor, and INDUSTRIAL MINERALS EXPLORATION COMPANY as Lessee, of the property containing forty (40) acres, more or less, in Hardin County, Illinois, more particularly described as follows:

> The North Half of the South West Quarter and the South Half of the North West Quarter of the South West Quarter, all in Section Thirty (30), Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian, containing in the aggregate forty (40) acres, more or less.

Dated: New York, New York
January 20, 1971

INDUSTRIAL MINERALS EXPLORATION

By _____
General Partner

MINING LEASE AND OPTION TO PURCHASE

THIS LEASE, made and entered into this 9th day of March, 1970, by and between EMMA D. JENKINS, a widow never having remarried, and EULALA WUNDERLICH and FRED WUNDERLICH, her husband, owners of certain mining properties hereinafter described, and hereinafter referred to as "Lessor", and INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms, and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all of those certain mining properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

A part of the east half of the South West Quarter (SW-1/4) of Section Thirty (30), Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian described by metes and bounds as follows: Beginning at a point on the south line of the North East Quarter (NE 1/4) of the South West Quarter (SW 1/4), forty (40) rods east of the South West (SW) corner thereof, thence running north thirty (30) rods, thence east thirty-three (33) rods to the west line of the Pleas Rose land, thence south thirty (30) rods to the south line of the North East Quarter (NE 1/4) of the South West Quarter (SW 1/4), thence east to the southeast corner of the said North East Quarter (NE 1/4) of the South West Quarter (SW 1/4), thence south to a point that is halfway to the southeast corner of the South East Quarter (SE 1/4) of the South West Quarter (SW 1/4), being the northeast corner of the Silas Stacy tract, thence due west to a point forty (40) rods east of the west line of the South East Quarter (SE 1/4) of the South West Quarter (SW 1/4), thence north to the place of beginning, containing twenty (20) acres, more or less.

It is expressly understood and agreed by both parties that this MINING LEASE WITH OPTION TO PURCHASE, succeeds, amends, and takes the place of the MINING LEASE WITH OPTION TO PURCHASE made between the parties hereto and executed on the 5th. day of July,

1963, same being recorded on Page 29, Book 7 of Miscellaneous in the Recorder's Office at the Hardin County Courthouse, Elizabethtown, Illinois.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, including oil and gas in, upon or underlying said lands, together with all rights and privileges necessary for mining, milling, treating, storing and removing the same, including full rights of ingress and egress over and across said lands.

In the event the Lessee is required to make any payment to any person or persons or to pay any reasonable legal fees in connection with perfection of title of Lessor to said mining claims, said sums shall be deducted from any amounts due Lessor under the terms of this agreement. If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other consideration herein provided for shall be paid by Lessee only in the proportion that Lessor's interest bears to the whole and undivided mineral estate.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mineral properties are free and clear from any right or claim of any other person.

2. TERM. The term of this lease shall be for a period of Ten (10) years from the date hereof and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of said mining properties.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale

of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows:

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value exceeding--$20.00/ton

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

4. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee

is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee

7. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon ten (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each month as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every

kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

10. ASSIGNMENT. This lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be solely responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or Liabilities under this lease and agreement, and Lessee shall proportionately be releived of any or all of said obligations or liabilities.

11. NOTICE. All rents and royalties to be paid to the Lessor under paragraph 3 of the Lease, any notices of cancellation or termination under paragraph 9 of the Lease, any notices to be given to Lessor under paragraph 11 of the Lease, shall be mailed, in the case of rents and royalties, and sent by registered mail in the case of notices to the HARRISBURG NATIONAL BANK, Harrisburg, Illinois, Attention: Mr. Davenport.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS: Lessee agrees that he will operate said mine in full compliance with all State mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or

material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any advance or minimum royalties paid to Lessor by Lessee may be credited by Lessee against future royalties

payable to the Lessor based upon production and sale of ore.

19. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

20. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

21. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

22. OPTION TO PURCHASE. Lessee shall have the right at any time during the term hereof to purchase the mineral properties leased hereunder, including surface rights as reserved in Warranty Deed recorded in Volume 27, page 308, in the Recorder's Office of Hardin County, Illinois, for the price of $20,000.00 upon giving notice in writing to Lessor of its intent to so do. In such event Lessor will deliver to Lessee within thirty (30) days after receipt of said notice a complete merchantable abstract of title or guaranty policy, or merchantable copy, brought down to the date hereof, and Lessee shall have thirty (30) days after receipt of such abstracts within which to specify in writing in detail the objections he makes to the title, if any; or is there be no objections, then stating in substance that the same is satisfactory. In case material defects be found in said title and so reported, then is such defects be not cured within sixty (60) days after such notice thereof, Lessee may take the title as it then is (with the right

to deduct from the purchase price liens or encumbrances of a definite or ascertainable amount) or may at his option terminate this agreement; notice of such election shall be given to Lessor within ten (10) days after the expiration of said sixty (60) days.

Lessee, within five (5) days after delivery of said abstract or guaranty policy showing such defects cured or removed, shall pay to Lessor the balance of the purchase price, provided Deed is ready for delivery, and Lessor shall at said time deliver to Lessee a good and sufficient Warranty Deed conveying to Lessee title to said premises (which Warranty Deed shall include a release of dower and waiver of homestead and shall be duly executed and stamped).

23. ADVANCE OR MINIMUM ROYALTIES. Lessee agrees to pay to Lessor advance or minimum royalties of $100.00 per year, for each year, as long as this MINING LEASE WITH OPTION TO PURCHASE is in force. The payment for the first year is to be made within thirty (30) days after the signing of this lease with subsequent payments due and payable on or before the anniversary of this lease.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

INDUSTRIAL MINERALS
EXPLORATION COMPANY

By _____
A General Partner

LESSOR:

_____

_____

_____

_____

STATE OF)
) ss.
COUNTY OF)

On the 9 day of Mch, 1970, before me, a Notary Public, personally appeared EMMA D. JENKINS, a widow, known to me to be the person whose name is subscribed to the within instrument, and acknowledged that she executed the same.

Notary Public in and for said County and State

STATE OF)
) ss.
COUNTY OF)

On the 9 day of Mch, 1970, before me, a Notary Public, personally appeared EULALA WUNDERLICH and FRED WUNDERLICH, her husband, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same.

Notary Public in and for said County and State

STATE OF New York)
) ss.
COUNTY OF New York)

On the 7th day of April, 1970, before me, a Notary Public, personally appeared JOHN L. CARROLL, personally known to me to be a general partner of Industrial Minerals Exploration Company, the limited partnership described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Industrial Minerals Exploration Company.

Notary Public in and for said County and State.

JOHN J. TRASK JR.
Notary Public, State of New York
No. 31-4612420
Qualified in New York County
Commission Expires March 30, 1971

ASSIGNMENT

In consideration of the premises and for other good and valuable consideration, the receipt of which is hereby acknowledged, INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, having its principal place of business at 345 Park Avenue, New York, New York 10022, does hereby sell, transfer and assign to ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York 10022, its entire right, title and interest as Lessee under the Mining Lease and Option to Purchase dated March 9, 1970 between EMMA D. JENKINS, a widow never having remarried, and EULALA WUNDERLICH and FRED WUNDERLICH, her husband, as Lessor, and INDUSTRIAL MINERALS EXPLORATION COMPANY, as Lessee, said Mining Lease and Option to Purchase having succeeded, amended and replaced a Mining Lease and Option to Purchase made between and executed by the parties on July 5, 1963, and recorded on page 29, Book 7 of Miscellaneous in the Recorder's Office at the Hardin County Courthouse, Elizabethtown, Illinois, of the property containing twenty (20) acres, more or less, in Hardin County, Illinois, more particularly described as follows:

> A part of the east half of the South West Quarter (SW-1/4) of Section Thirty (30), Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian described by metes and bounds as follows: Beginning at a point on the south line of the North East Quarter (NE-1/4) of the South West Quarter (SW-1/4), forty (40) rods east of the South West (SW) corner thereof, thence running north thirty (30) rods, thence east thirty-three (33) rods to the west line of the Pleas Rose land, thence south thirty (30) rods to the south line of the North East Quarter (NE-1/4) of the South West Quarter (SW-1/4), thence east to the southeast corner of the said North East Quarter (NE-1/4) of the South West Quarter (SW-1/4), thence south to a point that is halfway to the southeast corner of the South East Quarter (SE-1/4) of the South West Quarter

(SW-1/4), being the northeast corner of the Silas Stacy tract, thence due west to a point forty (40) rods east of the west line of the South East Quarter (SE-1/4) of the South West Quarter (SW-1/4), thence north to the place of beginning, containing twenty (20) acres, more or less.

Dated: New York, New York
January 20, 1971

INDUSTRIAL MINERALS EXPLORATION

By John L. Carroll
General Partner

STATE OF NEW YORK)
) SS.:
COUNTY OF NEW YORK)

On this 20th day of January, 1971, before me personally appeared John Lee Carroll, personally known to me to be a General Partner of Industrial Minerals Exploration Company, a limited partnership having its principal place of business at 345 Park Avenue, New York, New York 10022, and who executed the foregoing assignment, and duly acknowledged to me that he executed the same as the act and deed of said partnership.

Notary

MINING LEASE

THIS LEASE, made and entered into this 14th day of May, 1971, by and between EDWIN E. ROSE and GLADYS ROSE, his wife; THOMAS ROSE and VIVIAN ROSE, his wife; VELOISE ZELLER and WILLIAM ZELLER, her husband; and MAUDE E. WILLIAMS and VIRGIL H. WILLIAMS, her husband, owners of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and ANTAEUS RESOURCES CORPORATION, a corporation organized under the laws of the State of Delaware, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid kept and performed, does by these presents grant and lease to said Lessee all those certain mining properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The North West Quarter (NW 1/4) of the South East Quarter (SE 1/4) of Section Thirty (30), Township Eleven South (T 11 S) Range Eight East (R 8 E) of the Third Principal Meridian, and the North East Quarter (NE 1/4) of the South East Quarter (SE 1/4) of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E) of the Third Principal Meridian, and the ten (10) acres off the East Side of the North East Quarter (NE 1/4) of the South West Quarter (SW 1/4) of Section Thirty (30), Township Eleven South (T 11 S) Range Eight East (R 8 E) of the Third Principal Meridian, situated in the County of Hardin in the State of Illinois and containing in the aggregate ninety (90) acres, more or less.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, including oil and gas, in, upon and underlying said lands, together with all rights and privileges apertaining thereto.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mineral properties are free and clear from any right or claim of any other person or persons. Lessee agrees, how-

If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other consideration herein provided for shall be paid by Lessee only in the proportion the Lessor's interest bears to the whole and undivided mineral estate.

2. TERM. The primary term of this lease shall be for a period of five (5) years from the date hereof. This lease may be extended beyond the primary term and for so long thereafter as any mining, development or exploration

ever, that he will, at his own expense, cure any minor defects in Lessor's title which he deems necessary; and in the event such defects are of such a serious nature that they cannot be cured, then the rights and obligations of all the parties hereunder shall be terminated and this Lease held to be null and void.

is being conducted on the said properties.

3. RENTS AND ROYALTY. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the net returns derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows:

Twelve percent (12%) of the net returns

Net returns as used herein is defined to be that portion of proceeds from the sale of ore remaining after deducting such of the items of, actual trucking expense, transportation expenses by aerial or surface tramway, milling and or smelting costs or charges, and costs of transportation to a mill and or smelter. Said royalty payments shall be due and payable within fifteen days after receipt by Lessee of the money from the sale of said ore.

4. RENTAL PAYMENTS. The Lessee agrees to pay to the Lessor, as rental payments, One Thousand Two Hundred Dollars ($1,200.00) per year on the above described properties. The first payment shall be due upon the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease. In the event Lessee fails to make the rental payments within sixty (60) days after due, this lease is cancelled without any further notice due Lessee from Lessor.

5. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any rental payments shall be credited against production royalties only in the year produced and not to be cumulative.

6. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

7. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

8. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said

Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

9. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

10. TERMINATION. Lessee may cancel or terminate this lease upon sixty (60) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

11. DEFAULT. If Lessee fails, refuses or neglects to perform the terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing, to rectify such default, Lessor or his agents may reenter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

12. ASSIGNMENT. All parties hereto agree and understand that all the rights of either party hereto may be assigned, and the privilege of assigning or subletting in whole or in part is expressly allowed, and all the covenants and agreements hereunder shall inure to, continue and be binding upon the heirs, legal representatives, successor and assigns of the parties hereto, but no change in the ownership of the land or assignment of royalties shall be binding on the Lessee until after the Lessee has been furnished with a written, recorded transfer or assignment, or a true copy thereof.

13. NOTICE. Any notice required to be given to Lessor hereunder shall be given to him by registered mail addressed to him at ~~1220 Wayne Avenue, Collinsville, Illinois~~ or at such other address or addresses as he respectively may hereafter designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to it by registered mail and addressed to it at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as it may designate in writing from time to time.

14. COMPLIANCE WITH STATE LAWS. Lessee agrees that it will operate said mine in full compliance with all State mining laws.

15. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

16. LIABILITY AND NON-RESPONSIBILITY. Lessee will indemnify and hold Lessor harmless from and against all liability, claims, demands, injuries or damage done to persons or property caused by or in connection with its use of the above described premises and facilities, and the loading, hauling, and handling of the crude or finished product from the said premises, and all activities thereunder related, and Lessee shall, at his own expense, defend any and all actions based thereon and shall pay all charges of attorneys and all costs and other expenses arising therefrom.

17. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

18. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

19. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

19A. INCREASED REAL ESTATE PROPERTY TAXES. It is agreed that Lessee shall pay Eighty Eight Percent (88%) and Lessor shall pay Twelve Percent (12%) of any real estate property tax increases, over and above the present taxes that are due directly to mining operations or developments by the Lessee and not general real estate property tax increases.

20. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

21. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

ANTAEUS RESOURCES CORPORATION

By _____

LESSOR:

Thomas Rose

Vivian Rose

Maude E. Williams

David H. Williams

Velma Rose

William Rose

Edwin E. Rose

Gladys Rose

STATE OF KENTUCKY)
: ss.
COUNTY OF CRITTENDON)

I, , a Notary Public, in and for, and residing in said County, in the State aforesaid, DO HEREBY CERTIFY, that EDWIN E. ROSE and GLADYS ROSE, his wife, personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledge that they signed, sealed and delivered the said instrument as their free and voluntary act for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 2 day of April A. D. 1971.

Roylla Gough

My Commission Expires:
3-19-72

Colorado
STATE OF ILLINOIS)
El Paso : ss.
COUNTY OF HARDIN)

I, Mary Jean Davis , a Notary Public, in and for, and residing in said County, in the State aforesaid, DO HEREBY CERTIFY that THOMAS ROSE and VIVIAN ROSE, his wife, personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that they signed, sealed and delivered the said instrument as their free and voluntary act for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal, this 9th day of March , A. D. 1971

Mary Jean Davis

My Commission Expires:
July 25, 1971

Penna
STATE OF ILLINOIS)
allegheny : ss.
COUNTY OF MADISON)

I, Reuel B. McCorkell , a Notary Public, in and for and residing in said County, in the State aforesaid, DO HEREBY CERTIFY, that VELOISE ZELLER and WILLIAM ZELLER, her husband, personally known to me to be the same persons whose names are subscribed to the aforegoing instrument, appeared before me this day in person and acknowledged that the signed, sealed and delivered the said instrument as their free and voluntary act for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notaria seal this 27 day of March , A. D. 1971.

REUEL B. MCCORKELL NOTARY PUBLIC
WILKINSBURG, ALLEGHENY CO.
My Commission Expires
January 24, 1975

Reuel B. McCorkell

My Commission Expires:

STATE OF ILLINOIS)
: ss.
COUNTY OF JEFFERSON)

I, Martha Ann Stapleton, a Notary Public, in and for, and residing in said County, in the State aforesaid, DO HEREBY CERTIFY that MAUDE E. WILLIAMS and VIRGIL H. WILLIAMS, her husband, personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that they signed, sealed and delivered the said instrument as their free and voluntary act for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal, this 23rd day of March, A. D. 1971.

Martha A. Stapleton

My Commission Expires: 12-19-74

STATE OF NEW YORK)
: ss.
COUNTY OF NEW YORK)

On the 5 day of February, 1971, before me, a Notary Public, personally appeared FRANCIS H. CABOT, personally known to me to be the Executive Vice-President of Antaeus Resources Corporation, the corporation described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Antaeus Resources Corporation.

Notary Public in and for said County and State

My Commission Expires:

JOHN J. TRASK JR.
Notary Public, State of New York
No. 31-4612420
Qualified in New York County
Commission Expires March 30, 1971

MINING LEASE WITH OPTION TO PURCHASE

THIS AGREEMENT, made and entered into this 22nd day of February, 1972, by and between J. J. Coan Company, Inc., a corporation duly incorporated under the laws of the State of Utah, International Fastener Research Corp., a corporation incorporated under the laws of the State of New York, and J. D. Quarant and Allene B. Quarant, his wife, of Rural Route #1, Golconda, Illinois, owners of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and ANTAEUS RESOURCES CORPORATION, a corporation organized under the laws of the State of Delaware, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all those certain mining properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The South one-half (S$\frac{1}{2}$) of the Southeast one-quarter (SE$\frac{1}{4}$), except the North Fifteen (15) acres of the Southeast one-quarter of the Southeast one-quarter, in Section 30; and Northwest one-quarter (NW$\frac{1}{4}$) of the Northeast one-quarter (NE$\frac{1}{4}$), Section 31, all in T. 11 S., R. 8 E. of the Third Principal Meridian, containing 105 acres, more or less.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, including oil and gas, in, upon and underlying said lands, together with all rights and privileges apertaining thereto.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mineral properties are free and clear from any right or claim of any other person or persons.

If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other considerations herein provided for shall be paid by Lessee only in the proportion the Lessor's interest bears to the whole and undivided mineral estate.

2. TERM. The primary term of this Lease shall be for a period of Eight (8) years from the date hereof. This Lease may be extended beyond the primary term for and so long thereafter as any mining, development or exploration is being conducted on the said properties.

3. RENTS AND ROYALTY. As consideration for the granting of this lease to Lessee, and until and if the hereinafter described Option to Purchase is exercised, Lessee hereby agrees to pay to the Lessor in the manner as herein provided, a percentage royalty based on the value of the ore at the mouth of the mine. The percentage royalty paid to Lessor shall be Ten percent (10%). Said royalty payments shall be due and payable within fifteen days after receipt by Lessee of the money from the sale of said ore; but in no event shall the payment of royalty be delayed more than 45 days from the time that ore is removed from the premises.

4. RENTAL PAYMENTS. The Lessee agrees to pay to the Lessor, as rental payments, Seven Hundred and Fifty ($750.00) Dollars for the first year this agreement is in effect. After the first year, and for each year thereafter that this agreement is in effect, Lessee shall pay to Lessor One Thousand and Five Hundred Dollars ($1,500.00) as annual minimum royalty. The first payment shall be due upon the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease. In the event Lessee fails to make the rental payments within sixty (60) days after due, this lease is cancelled without any further notice due Lessee from Lessor.

5. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any rental payments shall be credited against production royalties only in the year produced and not to be cumulative.

6. RECORDS. Lessor shall have the right to check weights as often as he deems necessary. Lessor shall be given duplicate copies of all ore weights as they are removed from the demised premises. In addition, the Lessor shall be supplied with a copy of the purchaser's invoices showing ore sales, weights and analysis.

7. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

8. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

9. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

10. TERMINATION. Lessee may cancel or terminate this lease upon sixty (60) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee, and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

11. DEFAULT. If Lessee fails, refuses or neglects to perform the terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing, to rectify such default, Lessor or his agents may reenter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

12. ASSIGNMENT. All parties hereto agree and understand that all the rights of either party hereto may be assigned, and the privilege of assigning or subletting in whole or in part is expressly allowed, and all the covenants and agreements hereunder shall inure to, continue and be binding upon the heirs, legal representatives, successor and assigns of the parties hereto, but no change in the ownership of the land or assignment of royalties shall be binding on the Lessee until after the Lessee has been furnished with a written, recorded transfer or assignment, or a true copy thereof.

13. NOTICE. Any notice required to be given to Lessor hereunder shall be given to him by registered mail addressed to him at;

Mr. J. D. Quarant
Rural Route
Elizabethtown, Illinois 62931

or at such other address or addresses as he respectively may hereafter designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to it by registered mail and addressed to it at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as it may designate in writing from time to time.

14. COMPLIANCE WITH STATE LAWS. Lessee agrees that it will operate said mine in full compliance with all State mining laws.

15. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

16. LIABILITY AND NON-RESPONSIBILITY. Lessee will indemnify and hold Lessor harmless from and against all liability, claims, demands, injuries or damage done to persons or property caused by or in connection with its use of the above described premises and facilities, and the loading, hauling, and handling of the crude or finished product from the said premises, and all activities thereunder related, and Lessee shall, at his own expense, defend any and all actions based thereon and shall pay all charges of attorneys and all costs and other expenses arising therefrom.

17. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

18. TAXES. The parties hereto further agree that the assessed valuation of the demised lands herein for the taxable year of 1972 is for purposes hereinafter stated called the "BASE TAXABLE YEAR". The Lessor agrees to pay all taxes on the assessed valuations of said demised lands so lang as the assessed valuation does not exceed that of the 1972 "BASE TAXABLE YEAR". Any increase in assessments above the "BASE TAXABLE YEAR" which results in additional taxes on the demised premises shall be paid by the Lessee without credit toward the payment of rents and royalties due or hereinafter found to be due at any time during the life of this agreement or any renewals thereof. All other taxes, including severance taxes, value added taxes, resulting from mining operations shall be borne by the Lessee without credit toward the payment of rents and royalties due or hereinafter found to be due at any time while this agreement remains in effect.

19. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

20. OPTION TO PURCHASE. Lessee may elect to purchase the hereinbefore described mineral and mining rights together with all surface rights and other rights presently owned by Lessor. The election to purchase said land may be made by Lessee at any time during the primary term of eight (8) years, but not thereafter, and the purchase price therefore shall be One Hundred and Fifty Seven Thousand and Five Hundred Dollars ($157,500.00). Said election to purchase may be exercised by Lessee by giving written notice thereof to Lessor, as provided in Paragraph 13 of this Lease-Option. At the time such notice is given, Lessee shall deposit the sum of One Hundred and Fifty Seven Thousand and Five Hundred Dollars ($157,500.00) in escrow with the Citizens Bank and Trust Company, Paducah, Kentucky, the same to be held by said bank for delivery to Lessor, subject to perfection of title thereto as herein provided for.

The Lessor, upon receiving notice from Lessee of this election to purchase said lands and its deposit of said purchase money in escrow, shall thereupon make, execute and deliver to said escrow agent their good and sufficient Quit Claim Deed, conveying said land and all mineral and mining rights therein owned by Lessor to Lessee, its successors and assigns. The Quit Claim Deed shall be in substantially the same language as Aluminum Company of America granted the described premises to the Lessor herein.

Lessor shall promptly procure and deliver to Lessee an abstract of title to said lands so purchased showing good and merchantable title to said Lessor and said lands and mining rights, and the same to be free and clear of all liens and encumbrances.

Lessee shall promptly examine said abstract, and if any objections are found thereto, the same shall be set out in writing and delivered to said Lessor, whereupon Lessor agrees to correct all valid objections to said title, and if it becomes necessary to adequately correct such defects said Lessor agrees to bring suit to Quiet Title to said lands and during the pendency thereof and until final judgment in said proceedings, Lessee may continue to occupy and exercise his right to said lands as herein provided for.

21. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease With Option To Purchase the day and year first hereinabove written.

LESSEE:

Antaeus Resources Corporation

By_____
John L. Carroll
Vice President, Mining

ATTEST:

_____
Secretary

LESSOR:

J. D. Quarant

Allene B. Quarant

J. J. Coan Company, Inc.

BY: B. J. Coan

B. J. Coan, President

Attest:

Ernest L. Coan

Secretary

International Fastener Research Corp.

BY: _____
David Weisz, President

Attest: Alan Miller

Secretary

STATE OF NEW YORK)
) ss
COUNTY OF NEW YORK)

On the _____ day of _____, 197__, before me, a Notary Public, personally appeared John L. Carroll, personally known to me to be a Vice-President of Antaeus Resources Corporation, the corporation described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Antaeus Resources Corporation.

_____
Notary Public in and for said County and State

My commission expires:

STATE OF Illinois)
) ss
COUNTY OF HARDIN)

On the 22nd day of February, 1972, before me, a Notary Public personally appeared J. D. Quarant and Allene B. Quarant his wife, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed same.

Grace Fae Volkert
Notary Public in and for said County and State

My commission expires:
June 1, 1973

STATE OF Utah)
) ss
COUNTY OF Salt Lake)

On the 28th day of February, 1972, before me, a Notary Public, personally appeared B. J. Coan, personally known to me to be President of J. J. Coan Company, Inc., the corporation described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of J. J. Coan Company, Inc.

Jane M. Harris
Notary Public in and for said County and State

My commission expires: 8-2-72

State OF California)
) ss
COUNTY OF Los Angeles)

On the 1st day of March, 1972, before me, a Notary Public, personally appeared David Weisz, personally known to me to be President of International Fastener Corp., the corporation described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of International Fastener Corp.

OFFICIAL SEAL
HELEN SPECTOR
NOTARY PUBLIC - CALIFORNIA
PRINCIPAL OFFICE IN
LOS ANGELES COUNTY
My Commission Expires Jan. 7, 1973

Helen Spector
Notary Public in and for said County and State

My commission expires:

MINING LEASE

THIS LEASE, made and entered into this 20th day of March, 1970, by and between FIRST STATE BANK OF ELIZABETHTOWN, Hardin County, Illinois, owner of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all those certain mining properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The East Half (E-½) of the North East Quarter (NE-½) of Section Twenty-five (25), Township Eleven South (T 11 S), Range Seven East (R 7 E) of the third Principal Meridian; And the West Half (W-½) of the North West Quarter (NW-½) of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E) of the Third Principal Meridian, and containing in the aggregate one hundred sixty (160) acres, more of less.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, including oil and gas, in, upon and underlying said lands, together with all rights and privileges apertaining thereto.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mineral properties are free and clear from any right or claim of any other person or persons.

If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other consideration herein provided for shall be paid by Lessee only in the proportion the Lessor's interest bears to the whole and undivided mineral estate.

2. TERM. The primary term of this lease shall be for a period of ten (10) years from the date hereof. This lease may be extended beyond the primary term and for so long thereafter as Lessee expends the sum of Two Thousand Dollars ($2,000) per year in mining, development, exploration or prospecting upon any of the said mining properties, provided that after the primary term the production royalties paid must be equal to double the minimum royalty as hereinafter provided.

3. RENTS AND ROYALTY. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows;

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value of $20.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding $22.00/ton.

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

4. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor, as advance or minimum royalties, Five Hundred ($500.00) per year on the above described properties. The first payment shall be due within thirty (30) days after the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease. In the event Lessee fails to pay the advance or minimum royalty within sixty (60) days after due, this lease is cancelled without any further notice due Lessee from Lessor.

5. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any minimum or advance royalties shall be credited

against any future production royalties that may come due and owing only during the primary term of this lease.

6. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

7. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

8. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

9. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

10. TERMINATION. Lessee may cancel or terminate this lease upon (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of maney paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

11. DEFAULT. If Lessee fails, refuses or neglects to perform the terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing, to rectify such default, Lessor or his agents may reenter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

12. ASSIGNMENT. All parties hereto agree and understand that all the rights of either party hereto may be assigned, and the privilege of assigning or subletting in whole or in part is expressly allowed, and all the covenants and agreements hereunder shall inure to, continue and be binding upon the heirs, legal representatives, successor and assigns of the parties hereto, but no change in the ownership of the land or assignment of royalties shall be binding on the Lessee until after the Lessee has been furnished with a written, recorded transfer or assignment, or a true copy thereof.

13. NOTICE. Any notice required to be given to Lessor hereunder shall be given to him by registered mail addressed to him at Elizabethtown, Illinois, or at such other address or addresses as he respectively may hereafter designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

14. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all State mining laws.

15. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

16. LIABILITY AND NON-RESPONSIBILITY. Lessee will indemnify and hold Lessor harmless from and against all liability, claims, demands, injuries or damage done to persons or property caused by or in connection with its use of the above described premises and facilities, and the loading, hauling, and handling of the crude or finished product from the said premises, and all activities thereunder related, and Lessee shall, at his own expense, defend any and all actions based thereon and shall pay all charges of attorneys and all costs and other expenses arising therefrom.

17. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

18. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

19. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

20. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

21. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

INDUSTRIAL MINERALS EXPLORATION COMPANY

By John Lee Carroll
A General Partner

LESSOR:

FIRST STATE BANK OF ELIZABETHTOWN

By Tom A. Patterson
President

By Joseph B. Hillock
Cashier

STATE OF ILLINOIS)
) ss.
COUNTY OF HARDIN)

On the 26th day of March, 1970, before me, a Notary Public, personally appeared Tom Patton and Jack Holbrook, known to me to be the president and cashier, respectively, of the First State Bank of Elizabethtown, Illinois, the corporation that executed the within instrument, known to me to be the persons who executed the within instrument on behalf of the corporation therein named and acknowledged to me that such corporation executed the same.

My commission expires: July 4, 1972

Florence F. Lozyk
Notary Public in and for said County and State

STATE OF NEW YORK)
) ss
COUNTY OF New York)

On the 13th day of April, 1970, before me, a Notary Public, personally appeared John L. Carroll, personnally known to me to be a general partner of Industrial Minerals Exploration Company, the limited partnership described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Industrial Minerals Exploration Company.

Robert A Koch
Notary Public in and for said County and State

My commission expires:

ROBERT A. KOCH
NOTARY PUBLIC, State of New York
No. 30-2163512
Qualified in Nassau County
Certificate Filed in New York County
Commission Expires March 30, 1971

ASSIGNMENT

In consideration of the premises and for other good and valuable consideration, the receipt of which is hereby acknowledged, INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, having its principal place of business at 345 Park Avenue, New York, New York 10022, does hereby sell, transfer and assign to ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York 10022, its entire right, title and interest as Lessee under the Mining Lease dated March 20, 1970 between FIRST STATE BANK OF ELIZABETHTOWN, Hardin County, Illinois, as Lessor, and INDUSTRIAL MINERALS EXPLORATION COMPANY as Lessee, of the property containing one hundred sixty (160) acres, more or less, in Hardin County, Illinois, more particularly described as follows:

> The East Half (E 1/2) of the North East Quarter (NE 1/4) of Section Twenty-five (25), Township Eleven South (T 11 S), Range Seven East (R 7 E) of the third Principal Meridian; And the West Half (W 1/2) of the North West Quarter (NW 1/4) of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E) of the Third Principal Meridian, and containing in the aggregate one hundred sixty (160) acres, more or less.

Dated: New York, New York
January 20, 1971

INDUSTRIAL MINERALS EXPLORATION

By _____
General Partner

MINING LEASE

THIS LEASE, made and entered into this 30th ~~July~~ day of July, 1971, by and between ETTA IRBY, a widow never having remarried, and ILEY "DOC" PANKEY, a single man never having been married, both of Rural Route, Elizabethtown, Illinois, hereinafter referred to as "Lessor", and ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York, 10022, hereinafter referred to as "Lessee";

WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all of those certain mineral properties and mining rights belonging to Lessor, situated in Hardin County, State of Illinois, to-wit:

The North East Quarter of the North West Quarter (except a parcel described as follows: Commencing at the southeast corner of said forty acre tract and from thence running north a distance of one hundred ten (110) feet to a pointwhereon the south right of way line of the Church Public Road entering from the Hicks Town Elizabethtown Gravel Public Road intersecting the division line between the North West Quarter of the North East Quarter and the North East Quarter of the North West Quarter and from thence running west twelve degrees (12°) south a distance of one hundred eighty-six and five-tenths (186.5) feet along the south right of way line of said Church Public Road to a point whereon said south right of way line intersects the east right of way line of the Public Gravel Hicks Town, Elizabethtown Road, and from thence running in a general southeasterly direction along the course of the east right way line of the Public Gravel Hicks Town Elizabethtown Road to a point whereon said east right of way line intersects the division line between the North East Quarter and the South East Quarter of the North West Quarter and from thence running east along the last above mentioned division line a distance of ninety-three and five-tenths (93.5) feet to the point of beginning, containing thirty-one one-hundredths (.31) acres);

The South East Quarter of the North West Quarter (except a parcel discribed as follows: Commencing at the northeast corner of the South East Quarter of the North West Quarter and running west a distance of ninety-three and five-tenths (93.5) feet along the division line between the South East Quarter and the North East Quarter of the North West Quarter to a point whereon said division line intersects the east right of way line of the Public Gravel Road running from Hicks Town to Elizabethtown, and from thence running in a general southeasterly direction along the course of the east right of way line of said gravel road a distance of one hundred fifty-six (156) feet to a point whereon

said east right of way line intersects the division line between the East and West Halves of the North Half of Section Thirty (30) and from thence running north on last above mentioned division line a distance of one hundred thrity-seven and five-tenths (137.5) feet to the point of beginning, containing one hurdred forty-seven one-thousandths (.147) acre),

all in Section Thirty (30) Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian, containing in the aggregate seventy-nine and five hundred forty-three thousandths (79.543) acres, more or less, (except such part of the real estate above described used as public roads).

It being the intention of Lessor to include any additional interests they might acquire in the future, by any means, in the hereinabove described real estate.

Lessee agrees to conduct no mining, drilling explorations, sinking of shafts or tunnels, or any mining whatsoever on the property situated northeast of the Hickstown-Elizabethtown gravel road.

OK. to exclude RLW 8-2-72

WHEREAS, Lessee is interested in securing the entire andexclusive right to prospect for, mine, logwash and otherwise prepare for market any and all minerals and mineral substances of every kind and nature, in, on and beneath and underlying the above described real estate; and

WHEREAS, Lessor desires to have such minerals and mineral substances mined from said premises as above stated, and Lessee desires the right and privilege of entering upon said premises and working the same by use of suitable machinery, equipment, fixtures and buildings for mining and milling and related purposes which Lessee may desire to place upon the premises, and mining and recovering from said premises minerals and mineral substances for the purpose of sale and in the exploitation and determination of the possibilities of obtaining such mineral and mineral substances, and the same is agreeable to Lessor;

NOW, THEREFORE, in consideration of the sum of One Dollar ($1.00) and other valuable considerations paid or to be paid by the Lessee to the Lessor, and the mutual covenants to be kept and performed by the parties hereto as hereinafter expressed, the Lessor hands and by these presents do give and grant to said Lessee the exclusive right to enter upon said premises for the purpose of removing said minerals and mineral substance, erecting building to be used in connection, either directly or indirectly, with the operations of Lessees upon the above premises, installing machinery, tipples, sinking shafts, drifting, drilling, stripping, removing overburden or using any and all methods known to the science of mining, milling, refining or otherwise preparing ore minerals and mineral substance for market, and the exclusive right to so conduct prospecting, mining, milling and related operations upon the described premises, together with the right of ingress and egress and to build and construct over and across said lands, roads, trams and other means of conveyance for the purpose of transporting ore, minerals or other valuable mineral substances found thereon or thereunder, together with the right to use any water found on the property for any use related to the aforementioned purposes.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of said mining properties free and clear of any right or claim of any other person whatsoever, and that each and all of said claims and rights of Lessor as owner are now valid and subsisting.

In the event the Lessee is required to make any payment to any person or persons or to pay any reasonable legal fees in connection with perfection of title of Lessor to said mining properties, said sums shall be deducted from any amounts due Lessor under the terms of this lease. If Lessor owns a less interest in the above described land or any part thereof than the entire and undivided mineral estate, then the royalties and other considerations herein provided for shall be paid the Lessor only in the proportion which his interests bear to the whole and undivided fee of that portion of the leased premises from which the ore is extracted.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mining properties are free and clear from any right or claim of any other person.

2. TERM: The term of this lease shall be for a period of ~~TEN~~ Five ~~(10)~~ years from the date hereof and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of the said mining properties, said term commencing on the day and year first above mentioned.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the afore-described properties. The percentage royalty paid to Lessor shall be as follows;

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value of $20.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding $22.00/ton.

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

It is understood that the above cited percentage royalties are for the entire mineral estate and payment to Lessors cited herein will be prorated according to their interests in said mineral estate.

4. RECORDS. Lessee agrees to keep a full, true and accurate record showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this lease and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

7. INSURANCE. Lessee hereby agrees to carry adequate workmens conpensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon ten (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each month as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises, provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

10. ASSIGNMENT. This Lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be solely responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or liabilities under this lease and agreement, and Lessee shall proportionately be relieved of any or all of said obligations or liabilities.

11. NOTICE. All rents and royalties to be paid to the Lessor under paragraph 3 and 21 of the Lease, ~~any notice of cancellation or termination under paragraph 8 of the Lease, any notice to be given under paragraph 22,~~ shall be mailed in the case of rents and royalties and sent by registered mail in the case of notices to the HARRISBURG NATIONAL BANK, Harrisburg, Illinois, Attention: Mr. Davenport, or any other such address or addresses as Lessor may designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at any other such address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all state mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restriction of orders, suspension of buying by the govenment where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatso ever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

19. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

20. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

21. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor as advance or minimum royalties, the sum of FIVE HUNDRED-----DOLLARS ($500.00) per year for the entire mineral estate, for each year that this lease is in force and effect. The first payment is to be made within ten days of the signing date of this lease; subsequent payments due are to be made on or before the tenth day of each month.

22. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any advance or minimum royalty shall be credited to earned royalty, and earned royalty shall be credited to minimum royalty, during the year, but no minimum royalty payment shall be credited to earned royalty other than for the year in which said minimum royalty is paid.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

ANTAEUS RESOURCES CORPORATION

By John L. Carroll
John L. Carroll
Vice-President-Mining

LESSOR:

Etta Irby
Etta Irby

Iley Pankey
Iley "Doc" Pankey

STATE OF Illinois)
) ss
COUNTY OF Hardin)

On the 30th day of July, 1971, before me, a Notary Public, personnaly appeared Etta Irby and Iley Pankey, both of Rural Route, Elizabethtown, Illinois, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed same.

Ida L. Patton
Notary Public in and for said County and State

My commission expires:

4-11-72

STATE OF NEW YORK)
) ss
COUNTY OF NEW YORK

On the 4th day of August, 1971, before me, a Notary Public, personnally appeared John L. Carroll, personally known to me to be a Vice-President of Antaeus Resources Corporation, the corporation described in and which executed the foregoing instrument, and he acknowledged that executed the same as the act and deed of Antaeus Resources Corporation.

John D. Patton
Notary Public in and for said County and State

My commission expires:
4-1-72

JOHN J. TRACK JR.
Notary Public, State of New York
No. 31-4612424
Qualified in New York County
Commission Expires March 30, 1972

STATE OF ILLINOIS, } ss.
Hardin County

No. 5179

This instrument was filed for record in the Recorder's Office of Hardin County aforesaid, on the 26 day of Aug A. D. 1971 at 11:00 o'clock A.M., and recorded in Book 9 of Misc. on page 66.

Luther Sheridan
Recorder

Recording Fee

MINING LEASE

THIS LEASE, made and entered into this 12th day of March, 1970, by and between FLORENCE F. LOYD, a widow, FLUORINE LOYD, a widow, S. D. LOYD and BEULAH LOYD, his wife, MARYBELLE L. McLIN and W. R. McLIN, her husband, owners of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms, and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all those certain mineral properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The South West Quarter of the North East Quarter of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E), except a piece of land described as follows: Beginning at a point twelve (12) rods south of the northwest corner of said forty acre tract, thence running south twenty (20) rods, thence east twelve (12) rods to the road ditch, thence in a northwesterly direction with said ditch to a point directly east of the place of beginning, thence west to the place of beginning.

It is expressly understood and agreed by both parties that this MINING LEASE suceeds, amends, and takes the place of the MINING LEASE made between the parties hereto and executed on the 12th day of August, 1963, same being recorded on page 38, Book 7 of Miscellaneous in Recorder's Office of the Hardin County Courthouse, Elizabethtown, Illinois.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, except the oil and gas beneath and underlying the north half of said forty acre tract, in, upon and underlying said lands, together with all rights and privileges necessary for mining, milling, treating, storing and removing the same, including full rights of ingress and egress over and across said lands.

In the event the Lessee is required to make any payment to any person or persons or to pay any reasonable legal fees in connection with perfection of of title of Lessor to said mining claims, said sums shall be deducted from any amounts due Lessor under the terms of this agreement. If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other considerations herein provided for shall be paid by Lessee only in the proportion that Lessor's interest bears to the whole and undivided mineral estate.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mining properties are free and clear from any right or claim of any other person.

2. TERM. The term of this lease shall be for a period of Ten (10) years from the date hereof and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of the said mining properties.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows;

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value of $20.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding--$22.00/ton

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

4. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workman and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

7. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon ten (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each month as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

10. ASSIGNMENT. This lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be soley responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or liabilities under this lease and agreement, and Lessee shall proportionately be relieved of any or all of said obligations or liabilities.

11. NOTICE. All rents and royalties to be paid to the Lessor under paragraph 3 of the Lease, any notices of cancellation or termination under paragraph 9 of the Lease, any notices to be given to Lessor under paragraph 11 of the Lease, shall be mailed, in the case of rents and royalties, and sent by registered mail in the case of notices to the HARRISBURG NATIONAL BANK, Harrisburg, Illinois, Attention: Mr. Davenport.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all State mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered; waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

19. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

20. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

21. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor advance or minimum royalties of two hundred forty dollars ($240.00) for each year as long as this lease is in force.

The payment for the first year is to be made within thirty (30) days of the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease.

22. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any minimum royalty shall be credited to earned royalty during the year, but no minimum royalty payment shall be credited to earned royalty other than for the year in which said minimum royalty is paid.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

INDUSTRIAL MINERALS
EXPLORATION COMPANY

By _____
A General Partner

LESSOR:

_____

_____

_____

_____

_____

_____

_____

STATE OF ILLINOIS)
) ss.
COUNTY OF HARDIN)

On the 25th day of March, 1970, before me a Notary Public, personally appeared FLORENCE F. LOYD, a widow, and ~~T. W. LOYD~~ and FLUORINE LOYD, ~~husband and wife~~, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same.

Larry D. Pittenger
Notary Public in and for said County and State

My commission expires:
12-30-72

STATE OF Kentucky)
) ss.
COUNTY OF Marshall)

On the 12 day of March, 1970, before me a Notary Public, personally appeared S. D. LOYD and BEULAH LOYD, husband and wife, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same.

William C. Lipton
Notary Public in and for said County and State

My commission expires:
7-26-71

STATE OF Oregon)
) ss.
COUNTY OF Marion)

On the 2nd day of Mar, 1970, before me, a Notary Public, personally appeared MARYBELLE L. McLIN and W. R. McLIN, her husband, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same.

Bert Bacon
Notary Public in and for said County and State

My commission expires:

My Commission Expires April 27, 1971

STATE OF NEW YORK)
) ss.
COUNTY OF NEW YORK)

On the 16th, day of April, 1970, before me, a Notary Public, personally appeared JOHN L. CARROLL, personally known to me to be a general partner of Industrial Minerals Exploration Company, the limited partnership described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Industrial Minerals Exploration Company.

Robert A Koch
Notary Public in and for said County and State

My commission expires:

ROBERT A. KOCH
NOTARY PUBLIC, State of New York
No. 30-2163512
Qualified in Nassau County
Certificate filed in New York County
Commission Expires March 30, 1971

ASSIGNMENT

In consideration of the premises and for other good and valuable consideration, the receipt of which is hereby acknowledged, INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, having its principal place of business at 345 Park Avenue, New York, New York 10022, does hereby sell, transfer and assign to ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York 10022, its entire right, title and interest as Lessee under the Mining Lease dated March 12, 1970 between FLORENCE F. LOYD, a widow, FLUORINE LOYD, a widow, S.D. LOYD and BEULAH LOYD, his wife, and MARYBELLE L. McLIN, and W.R. McLIN, her husband, as Lessor, and INDUSTRIAL MINERALS EXPLORATION COMPANY as Lessee, said Mining Lease having succeeded, amended and replaced a Mining Lease made between and executed by the parties on August 12, 1963, and recorded on page 38, Book 7 of Miscellaneous in the Recorder's Office at the Hardin County Courthouse, Elizabethtown, Illinois, of the property in Hardin County, Illinois, more particularly described as follows:

> The South West Quarter of the North East Quarter of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E), except a piece of land described as follows: Beginning at a point twelve (12) rods south of the northwest corner of said forty acre tract, thence running south twenty (20) rods, thence east twelve (12) rods to the road ditch, thence in a northwesterly direction with said ditch to a point directly east of the place of beginning, thence west to the place of beginning.

Dated: New York, New York
January 20, 1971

INDUSTRIAL MINERALS EXPLORATION

By _____
General Partner

STATE OF NEW YORK)
) SS.:
COUNTY OF NEW YORK)

On this 20th day of January, 1971, before me personally appeared John Lee Carroll, personally known to me to be a General Partner of Industrial Minerals Exploration Company, a limited partnership having its principal place of business at 345 Park Avenue, New York, New York 10022, and who executed the foregoing assignment, and duly acknowledged to me that he executed the same as the act and deed of said partnership.

_____
Notary

MINING LEASE

THIS LEASE, made and entered into this 18th FEB. day of February, 1972, by and between WILLIAM L. HAMP and APPLENA HAMP, his wife, of 3724 Windona Way, North Highlands, California, 95660, JAMES E. HAMP and DIANE K. HAMP, his wife, of 2920 Greenwood Avenue, Sacramento, California, 95821 and FRANKLIN E. HAMP and MARY H. HAMP, his wfie, of 6918 Larsen Lane, Shawnee Mission, Kansas, hereinafter referred to as "Lessor", and ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York, 10022, hereinafter referred to as "Lessee";

WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all of those certain mineral properties and mining rights including oil and gas belonging to Lessor, situated in Hardin County, State of Illinois, to-wit:

> The N1/2 of the NW1/4 of the SW1/4 and a part of the E1/2 of the SW1/4 described by metes and bounds as follows:
> Beginning at the NW corner of the said E1/2 of the SW1/4, thence running South with the West line thereof to the center point of the West line of the SE1/4 of the SW1/4, being the NW corner of the Silas Stacy tract, thence East 40 rods, thence North to a point 30 rods North of the North line of the SE1/4 of the SW1/4, thence East 33 rods to the West line of the Pleas Rose tract, thence, North to the North line of the said E1/2 SW1/4, thence West to the place of beginning, all in Section 30, Township 11 South, Range 8 East of the Third Principal Meridian, containing in the aggregate, 61 1/2 acres, more or less,

together with all land or interests owned by Lessor adjoining or contiguous to the land above described, whether in the same or different surveys, but limited to the rights now owned by Lessor.

WHEREAS, Lessee is interested in securing the entire and exclusive right to prospect for, mine, logwash and otherwise prepare for market any and all minerals and mineral substances of every kind and nature, in, on and beneath and underlying the above described real estate; and

WHEREAS, Lessor desires to have such minerals and mineral substances mined from said premises as above stated, and Lessee desires the right and privilege of entering upon said presmies and working the same by use of suitable machinery, equipment, fixtures and buildings for mining and milling and related purposes which Lessee may desire to place upon the premises, and mining and recovering from said premises minerals and mineral substances for the purpose of sale and in the exploitation and determination of the possibilities of obtaining such mineral and mineral substances, and the same is agreeable to Lessor;

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character in, upon and underlying said lands together with all rights and privileges necessary for mining, milling, treating, storing and removing the same, including the full rights of ingress and egress over and across said lands, it being specifically understood by Lessee and Lessor that the rights covered herein are limited to those owned by Lessor on the date of this Mining Lease.

If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other considerations herein provided for shall be paid by Lessee only in the proportion that Lessor's interest bears to the whole and undivided mineral estate.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mining properties are free and clear from any right or claim of any other person.

2. TERM. The term of this lease shall be for a period of Ten (10) years, commencing on January 1, 1972 and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of the said mining properties.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows:

5%-for ores having a "net proceeds" value of $0.00 --$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
10%-for ores having a "net proceeds" value of $18.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding--$22.00/ton

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty production payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

In the case of oil and gas, the royalties reserved by Lessor, and which shall be paid by Lessee are one-eighth (1/8th) of that produced and saved from the leased premises, the same to be delivered at the wells or to the credit of Lessor in the pipeline to which the wells may be connected.

4. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of the Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items with the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

7. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon Thirty (30) days' notice in writing to that effect mailed to Lessor as Provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Leesor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and character which the Lessor may have against the Lessee.

Lessee further agrees that if and when this Mining Lease is terminated, he will furnish Lessor, free of charge and without any interpretation, implied or otherwise, a copy of a map showing the location of drill holes, logs of any such drill holes and geologic, geochemical and geophysical maps made by him.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each year as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be tained as rental for the use and occupation of said premises by Lessee, and thereupon with Ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the Attorney for the Lessor.

10. ASSIGNMENT. This lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be soley responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or liabilities under this lease and agreement, and Lessee shall proportionately be relieved of any or all of said obligations or liabilities.

11. NOTICE. All rents and royalties to be paid to the Lessor under paragraphs 3 and 21 of the Lease, any notices of cancellation or termination under paragraph 9 of the Lease, any notices to be given to Lessor under paragraph 11 of the Lease, shall be mailed in the case of rents and royalties and sent by registered mail in the case of notices to the addresses of Lessors as hereinabove first written.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all State mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions or orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operation hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

19. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

20. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

21. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor advance or minimum royalties of ~~ONE~~ TWO THOUSAND ~~AND FIVE~~ TWO HUNDRED ~~DOLLARS~~ SIXTY DOLLA ($1,500.00) per year for each year as long as this lease is in force. The payment for the first year is to be made within thirty (30) days of the signing date of this lease; subsequent payments are to be made on or before the first day of each succeeding year.

(1,160.00) J.E.H. F.E.H. fc

22. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any minimum royalty shall be credited to earned royalty during the year, but no minimum royalty payment shall be credited to earned royalty other than for the year in which said minimum royalty is paid.

23. WORK COMMITMENTS. Lessee agrees that during the term of this Mining Lease, and to keep this Lease in force and effect, he will spend or cause to be spent, an average minimum of TWO THOUSAND DOLLARS ($2,000.00) per year on the subject properties, said sums to be spent on drill holes or other exploration work. Amounts spent in any one year exceeding TWO THOUSAND DOLLARS ($2,000.00) may be applied by Lessee to requirements for succeeding years.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

ANTAEUS RESOURCES CORPORATION

By _____
John L. Carroll
Vice President

LESSOR:

_____
James E. Hamp

_____
Diane K. Hamp

_____
William L. Hamp

_____
Applena Hamp

_____
Mary H. Hamp

_____
Franklin E. Hamp

STATE OF NEW YORK)
) ss
COUNTY OF NEW YORK)

On the 29th day of February, 1972, before me, a Notary Public, personally appeared John L. Carroll, personally known to me to be a Vice-President of Antaeus Resources Corporation, the corporation described in and which executed the foregoing instrument, and he acknowledged that executed the same as the act and deed of Antaeus Resources Corporation.

Notary Public in and for said County and State

My commission expires:

STATE OF California
) ss
COUNTY OF Sacramento

On the 16th day of February, 1972, before me, a Notary Public personally appeared James E. Hamp and Diane K. Hamp

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

SYDNEY R. JOHNSON
NOTARY PUBLIC
STATE OF CALIFORNIA
PRINCIPAL OFFICE IN SACRAMENTO
MY COMMISSION EXPIRES FEB 27, 1973

Notary Public in and for said County and State

My commission expires:
February 27, 1973

STATE OF CALIFORNIA
) ss
COUNTY OF YOLO)

On the 15th day of February, 1972, before me, a Notary Public personally appeared WILLIAM L. HAMP and ADRIENNE HAMP, his wife

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

Notary Public in and for said County and State

My commission expires:
November 21, 1973.

MARCIA J. MAXWELL
NOTARY PUBLIC
YOLO COUNTY, CALIFORNIA
My commission expires November 21, 1973

STATE OF Missouri)
) ss
COUNTY OF Jackson)

On the 18th day of February, 1972, before me, a Notary Public personally appeared Mary H. Hamp and Franklin E. Hamp

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

Cheryl Hamilton
Notary Public in and for said County and State

My commission expires:
February 15, 1974

STATE OF)
) ss
COUNTY OF)

On the _____ day of _____, 197___, before me, a Notary Public personally appeared _____

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

Notary Public in and for said County and State

My commission expires:

STATE OF)
) ss
COUNTY OF)

On the _____ day of _____, 197___, before me, a Notary Public personally appeared _____

known to me to be the person (s) whose names are subscribed to the within instrument, and acknowledged that they executed same.

Notary Public in and for said County and State

My commission expires:

Signature

R.O.W. to file

MINING LEASE

THIS LEASE, made and entered into this 14 day of April, 1970, by and between LOLA EWELL FREDRICKS and JACK L. FREDRICKS, her husband, and SOPHIA COY, owners of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, hereinafter referred to as "Lessee" ;

WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all of those certain mineral properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The North Half of the South West Quarter and the South Half of the North West Quarter of the South West Quarter, all in Section Thirty (30), Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian, containing in the aggregate forty (40) acres, more or less.

1.. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of said mining properties free and clear of any right or claim of any other person whatsoever, and that each and all of said claims and rights of Lessor as owner of each and all of said mining properties are now valid and subsisting.

In the event the Lessee is required to make any payment to any person or persons or to pay any reasonable legal fees in connection with perfection of title of Lessor to said mining claims, said sums shall be deducted from any amounts due Lessor under the terms of this agreement. If Lessor owns a less interest in the above described land or any part thereof than the entire and undivided fee simple estate, then the royalties and other consideration herein provided for shall be paid the Lessor

only in the proportion which his interests bear to the whole and undivided fee of that portion of the leased premises from which the ore is extracted.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mining properties are free and clear from any right or claim of any other person.

2. TERM. The term of this lease shall be for a period of Ten (10) years from the date hereof and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of the said mining properties.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows;

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value of $20.00--$22.00/ton
12%-for ores having a "net proceeds" value exceeding--$22.00/ton

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

4. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workman and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

7. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon ten (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents

and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each month as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possission of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

10. ASSIGNMENT. This lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be soley responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or liabilities under this lease and agreement, and Lessee shall proportionately be relieved of any or all of said obligations or liabilities.

11. NOTICE. Any notice required to be given to Lessor hereunder shall be given to him by registered mail addressed to him at: 2007 Mass St.
Eugene, Oregon 97403
or at such other address or addresses as he respectively may hereafter designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all State mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

19. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

20. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

21. ADVANCE OR MINIMUM ROYALTIES. The Lessee agrees to pay to the Lessor advance or minimum royalties of Eighty Dollars ($80.00) for each year as long as this lease is in force. The payment for the first year is to be made within thirty (30) days of the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease.

22. CREDIT AGAINST FUTURE PRODUCTION. It is understood

and agreed that any advance or minimum royalties paid to Lessor by Lessee may be credited by Lessee against future royalties payable to the Lessor based upon production and sale of ore.

23. OIL AND GAS ROYALTIES. The Lessee agrees to pay to Lessor in a manner as herein provided, a royalty of twelve and one-half percent (12½%) of net proceeds received from the sale of oil and gas.

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

LESSEE:

INDUSTRIAL MINERALS
EXPLORATION COMPANY

By _____
A General Partner

LESSOR:

Ralph Emell Fredricks

Jack Y. Fredricks

_____

_____

STATE OF Arizona)
COUNTY OF Maricopa) ss.

On the 14th day of April, 1970, before me, a Notary Public, personally appeared LOLA EWELL FREDRICKS and JACK L. FREDRICKS known to me to be the persons whose names subscribed to the within instrument, and acknowledged that they executed the same.

Notary Public in and for said County and State

My Commission Expires Nov. 7, 1971

STATE OF)
COUNTY OF) ss.

On the _____ day of _____, 1970, before me, a Notary Public, personally appeared SOPHIA COY known to me to be the person whose name subscribed to the within instrument, and acknowledged that she executed the same.

Notary Public in and for said County and State

STATE OF)
COUNTY OF) ss.

On the _____ day of _____, 1970, before me, a Notary Public, personally appeared JOHN L. CARROLL, personally known to me to be a general partner of Industrial Minerals Exploration Company, the limited partnership described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Industrial Minerals Exploration Company.

Notary Public in and for said County and State

ASSIGNMENT

In consideration of the premises and for other good and valuable consideration, the receipt of which is hereby acknowledged, INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, having its principal place of business at 345 Park Avenue, New York, New York 10022, does hereby sell, transfer and assign to ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York 10022, its entire right, title and interest as Lessee under the Mining Lease dated April 14, 1970 between LOLA EWELL FREDRICKS and JACK L. FREDRICKS, her husband, and SOPHIA COY as Lessor, and INDUSTRIAL MINERALS EXPLORATION COMPANY as Lessee, of the property containing forty (40) acres, more or less, in Hardin County, Illinois, more particularly described as follows:

> The North Half of the South West Quarter and the South Half of the North West Quarter of the South West Quarter, all in Section Thirty (30), Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian, containing in the aggregate forty (40) acres, more or less.

Dated: New York, New York
January 20, 1971

INDUSTRIAL MINERALS EXPLORATION

By _____
General Partner

MINING LEASE AND OPTION TO PURCHASE

THIS LEASE, made and entered into this 9th day of March, 1970, by and between EMMA D. JENKINS, a widow never having remarried, and EULALA WUNDERLICH and FRED WUNDERLICH, her husband, owners of certain mining properties hereinafter described, and hereinafter referred to as "Lessor", and INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms, and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all of those certain mining properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> A part of the east half of the South West Quarter (SW-1/4) of Section Thirty (30), Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian described by metes and bounds as follows: Beginning at a point on the south line of the North East Quarter (NE 1/4) of the South West Quarter (SW 1/4), forty (40) rods east of the South West (SW) corner thereof, thence running north thirty (30) rods, thence east thirty-three (33) rods to the west line of the Pleas Rose land, thence south thirty (30) rods to the south line of the North East Quarter (NE 1/4) of the South West Quarter (SW 1/4), thence east to the southeast corner of the said North East Quarter (NE 1/4) of the South West Quarter (SW 1/4), thence south to a point that is halfway to the southeast corner of the South East Quarter (SE 1/4) of the South West Quarter (SW 1/4), being the northeast corner of the Silas Stacy tract, thence due west to a point forty (40) rods east of the west line of the South East Quarter (SE 1/4) of the South West Quarter (SW 1/4), thence north to the place of beginning, containing twenty (20) acres, more or less.

It is expressly understood and agreed by both parties that this MINING LEASE WITH OPTION TO PURCHASE, succeeds, amends, and takes the place of the MINING LEASE WITH OPTION TO PURCHASE made between the parties hereto and executed on the 5th. day of July,

6. Jenkins-Wundrlich

1963, same being recorded on Page 29, Book 7 of Miscellaneous in the Recorder's Office at the Hardin County Courthouse, Elizabethtown, Illinois.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, including oil and gas in, upon or underlying said lands, together with all rights and privileges necessary for mining, milling, treating, storing and removing the same, including full rights of ingress and egress over and across said lands.

In the event the Lessee is required to make any payment to any person or persons or to pay any reasonable legal fees in connection with perfection of title of Lessor to said mining claims, said sums shall be deducted from any amounts due Lessor under the terms of this agreement. If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other consideration herein provided for shall be paid by Lessee only in the proportion that Lessor's interest bears to the whole and undivided mineral estate.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mineral properties are free and clear from any right or claim of any other person.

2. TERM. The term of this lease shall be for a period of Ten (10) years from the date hereof and for so long thereafter as any mining, development, exploration or prospecting is conducted upon any of said mining properties.

3. RENTS AND ROYALTIES. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the "net proceeds" derived from the sale

of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows:

5%-for ores having a "net proceeds" value of $ 0.00--$12.00/ton
6%-for ores having a "net proceeds" value of $12.00--$14.00/ton
7%-for ores having a "net proceeds" value of $14.00--$16.00/ton
8%-for ores having a "net proceeds" value of $16.00--$18.00/ton
9%-for ores having a "net proceeds" value of $18.00--$20.00/ton
10%-for ores having a "net proceeds" value exceeding--$20.00/ton

"Net proceeds" as used herein is defined to be the value of the crude ore at the mouth of the mine. Said royalty payments shall be due and payable within thirty days after receipt by Lessee of the money from the sale of said ore.

4. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

5. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

6. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee

is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee

7. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

8. TERMINATION. Lessee may cancel or terminate this lease upon ten (10) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

9. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royalties each month as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every

kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

10. ASSIGNMENT. This lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be solely responsible to Lessor for such assignee's pro rata portion of any or all of the obligations or Liabilities under this lease and agreement, and Lessee shall proportionately be releived of any or all of said obligations or liabilities.

11. NOTICE. All rents and royalties to be paid to the Lessor under paragraph 3 of the Lease, any notices of cancellation or termination under paragraph 9 of the Lease, any notices to be given to Lessor under paragraph 11 of the Lease, shall be mailed, in the case of rents and royalties, and sent by registered mail in the case of notices to the HARRISBURG NATIONAL BANK, Harrisburg, Illinois, Attention: Mr. Davenport.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail and addressed to him at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as he may designate in writing from time to time.

12. COMPLIANCE WITH STATE LAWS: Lessee agrees that he will operate said mine in full compliance with all State mining laws.

13. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

14. LIABILITY AND NON-RESPONSIBILITY. Lessee shall pay, as due, all valid claims for work done, services rendered, or

material furnished to the leased premises and shall hold Lessor harmless from any liability arising out of any operations under the lease. Lessee shall defend all suits or claims arising out of such operations at his own expense. Lessee agrees to post notice of nonresponsibility signs upon the property for the protection of the Lessor.

15. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

16. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

17. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

18. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any advance or minimum royalties paid to Lessor by Lessee may be credited by Lessee against future royalties

payable to the Lessor based upon production and sale of ore.

19. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

20. NUMEROUS LESSORS. If at any time five parties or more are entitled to receive royalties under this lease, Lessee may withhold payment until all parties designate in writing a trustee to receive all royalty payments and to execute division and transfer orders for those entitled to royalties. The writing must be recordable, binding upon heirs and successors in title, and filed with the Lessee.

21. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

22. OPTION TO PURCHASE. Lessee shall have the right at any time during the term hereof to purchase the mineral properties leased hereunder, including surface rights as reserved in Warranty Deed recorded in Volume 27, page 308, in the Recorder's Office of Hardin County, Illinois, for the price of $20,000.00 upon giving notice in writing to Lessor of its intent to so do. In such event Lessor will deliver to Lessee within thirty (30) days after receipt of said notice a complete merchantable abstract of title or guaranty policy, or merchantable copy, brought down to the date hereof, and Lessee shall have thirty (30) days after receipt of such abstracts within which to specify in writing in detail the objections he makes to the title, if any; or is there be no objections, then stating in substance that the same is satisfactory. In case material defects be found in said title and so reported, then is such defects be not cured within sixty (60) days after such notice thereof, Lessee may take the title as it then is (with the right

to deduct from the purchase price liens or encumbrances of a definite or ascertainable amount) or may at his option terminate this agreement; notice of such election shall be given to Lessor within ten (10) days after the expiration of said sixty (60) days.

Lessee, within five (5) days after delivery of said abstract or guaranty policy showing such defects cured or removed, shall pay to Lessor the balance of the purchase price, provided Deed is ready for delivery, and Lessor shall at said time deliver to Lessee a good and sufficient Warranty Deed conveying to Lessee title to said premises (which Warranty Deed shall include a release of dower and waiver of homestead and shall be duly executed and stamped).

23. ADVANCE OR MINIMUM ROYALTIES. Lessee agrees to pay to Lessor advance or minimum royalties of $100.00 per year, for each year, as long as this MINING LEASE WITH OPTION TO PURCHASE is in force. The payment for the first year is to be made within thirty (30) days after the signing of this lease with subsequent payments due and payable on or before the anniversary of this lease.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

INDUSTRIAL MINERALS
EXPLORATION COMPANY

By _____
A General Partner

LESSOR:

_____

_____

_____

_____

STATE OF)
) ss.
COUNTY OF)

On the 9 day of March, 1970, before me, a Notary Public, personally appeared EMMA D. JENKINS, a widow, known to me to be the person whose name is subscribed to the within instrument, and acknowledged that she executed the same.

Notary Public in and for said County and State

STATE OF)
) ss.
COUNTY OF)

On the 9 day of March, 1970, before me, a Notary Public, personally appeared EULALA WUNDERLICH and FRED WUNDERLICH, her husband, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same.

Notary Public in and for said County and State

STATE OF New York)
) ss.
COUNTY OF New York)

On the 7th day of April, 1970, before me, a Notary Public, personally appeared JOHN L. CARROLL, personally known to me to be a general partner of Industrial Minerals Exploration Company, the limited partnership described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Industrial Minerals Exploration Company.

Notary Public in and for said County and State

JOHN J. TRASK JR.
Notary Public, State of New York
No. 31-4012420
Qualified in New York County
Commission Expires March 30, 1971

ASSIGNMENT

In consideration of the premises and for other good and valuable consideration, the receipt of which is hereby acknowledged, INDUSTRIAL MINERALS EXPLORATION COMPANY, a limited partnership organized under the laws of the State of New York, having its principal place of business at 345 Park Avenue, New York, New York 10022, does hereby sell, transfer and assign to ANTAEUS RESOURCES CORPORATION, a Delaware corporation, having its principal place of business at 345 Park Avenue, New York, New York 10022, its entire right, title and interest as Lessee under the Mining Lease and Option to Purchase dated March 9, 1970 between EMMA D. JENKINS, a widow never having remarried, and EULALA WUNDERLICH and FRED WUNDERLICH, her husband, as Lessor, and INDUSTRIAL MINERALS EXPLORATION COMPANY, as Lessee, said Mining Lease and Option to Purchase having succeeded, amended and replaced a Mining Lease and Option to Purchase made between and executed by the parties on July 5, 1963, and recorded on page 29, Book 7 of Miscellaneous in the Recorder's Office at the Hardin County Courthouse, Elizabethtown, Illinois, of the property containing twenty (20) acres, more or less, in Hardin County, Illinois, more particularly described as follows:

> A part of the east half of the South West Quarter (SW-1/4) of Section Thirty (30), Township Eleven (11) South, Range Eight (8) East of the Third Principal Meridian described by metes and bounds as follows: Beginning at a point on the south line of the North East Quarter (NE-1/4) of the South West Quarter (SW-1/4), forty (40) rods east of the South West (SW) corner thereof, thence running north thirty (30) rods, thence east thirty-three (33) rods to the west line of the Pleas Rose land, thence south thirty (30) rods to the south line of the North East Quarter (NE-1/4) of the South West Quarter (SW-1/4), thence east to the southeast corner of the said North East Quarter (NE-1/4) of the South West Quarter (SW-1/4), thence south to a point that is halfway to the southeast corner of the South East Quarter (SE-1/4) of the South West Quarter

(SW-1/4), being the northeast corner of the Silas Stacy tract, thence due west to a point forty (40) rods east of the west line of the South East Quarter (SE-1/4) of the South West Quarter (SW-1/4), thence north to the place of beginning, containing twenty (20) acres, more or less.

Dated: New York, New York
January 20, 1971

INDUSTRIAL MINERALS EXPLORATION

By John L. Carroll
General Partner

STATE OF NEW YORK)
) SS.:
COUNTY OF NEW YORK)

On this 20th day of January, 1971, before me personally appeared John Lee Carroll, personally known to me to be a General Partner of Industrial Minerals Exploration Company, a limited partnership having its principal place of business at 345 Park Avenue, New York, New York 10022, and who executed the foregoing assignment, and duly acknowledged to me that he executed the same as the act and deed of said partnership.

Notary

MINING LEASE

THIS LEASE, made and entered into this 14th day of May, 1971, by and between EDWIN E. ROSE and GLADYS ROSE, his wife; THOMAS ROSE and VIVIAN ROSE, his wife; VELOISE ZELLER and WILLIAM ZELLER, her husband; and MAUDE E. WILLIAMS and VIRGIL H. WILLIAMS, her husband, owners of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and ANTAEUS RESOURCES CORPORATION, a corporation organized under the laws of the State of Delaware, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid kept and performed, does by these presents grant and lease to said Lessee all those certain mining properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The North West Quarter (NW 1/4) of the South East Quarter (SE 1/4) of Section Thirty (30), Township Eleven South (T 11 S) Range Eight East (R 8 E) of the Third Principal Meridian, and the North East Quarter (NE 1/4) of the South East Quarter (SE 1/4) of Section Thirty (30), Township Eleven South (T 11 S), Range Eight East (R 8 E) of the Third Principal Meridian, [and the ten (10) acres off the East Side of the North East Quarter (NE 1/4) of the South West Quarter (SW 1/4) of Section Thirty (30), Township Eleven South (T 11 S) Range Eight East (R 8 E) of the Third Principal Meridian, situated in the County of Hardin in the State of Illinois and containing in the aggregate ninety (90) acres, more or less.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, including oil and gas, in, upon and underlying said lands, together with all rights and privileges apertaining thereto.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mineral properties are free and clear from any right or claim of any other person or persons. Lessee agrees, how-

If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other consideration herein provided for shall be paid by Lessee only in the proportion the Lessor's interest bears to the whole and undivided mineral estate.

2. TERM. The primary term of this lease shall be for a period of five (5) years from the date hereof. This lease may be extended beyond the primary term and for so long thereafter as any mining, development or exploration

ever, that he will, at his own expense, cure any minor defects in Lessor's title which he deems necessary; and in the event such defects are of such a serious nature that they cannot be cured, then the rights and obligations of all the parties hereunder shall be terminated and this Lease held to be null and void.

is being conducted on the said properties.

3. RENTS AND ROYALTY. As consideration for the granting of this lease to Lessee, Lessee hereby agrees to pay to the Lessor in the manner as herein provided a percentage royalty based on the value of the net returns derived from the sale of mineral production of every kind and nature mined and shipped from the aforedescribed properties. The percentage royalty paid to Lessor shall be as follows:

Twelve percent (12%) of the net returns

Net returns as used herein is defined to be that portion of proceeds from the sale of ore remaining after deducting such of the items of, actual trucking expense, transportation expenses by aerial or surface tramway, milling and or smelting costs or charges, and costs of transportation to a mill and or smelter. Said royalty payments shall be due and payable within fifteen days after receipt by Lessee of the money from the sale of said ore.

4. RENTAL PAYMENTS. The Lessee agrees to pay to the Lessor, as rental payments, One Thousand Two Hundred Dollars ($1,200.00) per year on the above described properties. The first payment shall be due upon the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease. In the event Lessee fails to make the rental payments within sixty (60) days after due, this lease is cancelled without any further notice due Lessee from Lessor.

5. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any rental payments shall be credited against production royalties only in the year produced and not to be cumulative.

6. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

7. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

8. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said

Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

9. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

10. TERMINATION. Lessee may cancel or terminate this lease upon sixty (60) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

11. DEFAULT. If Lessee fails, refuses or neglects to perform the terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing, to rectify such default, Lessor or his agents may reenter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

12. ASSIGNMENT. All parties hereto agree and understand that all the rights of either party hereto may be assigned, and the privilege of assigning or subletting in whole or in part is expressly allowed, and all the covenants and agreements hereunder shall inure to, continue and be binding upon the heirs, legal representatives, successor and assigns of the parties hereto, but no change in the ownership of the land or assignment of royalties shall be binding on the Lessee until after the Lessee has been furnished with a written, recorded transfer or assignment, or a true copy thereof.

13. NOTICE. Any notice required to be given to Lessor hereunder shall be given to him by registered mail addressed to him at ~~1220 Wayne Avenue, Collinsville, Illinois~~ or at such other address or addresses as he respectively may hereafter designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to it by registered mail and addressed to it at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as it may designate in writing from time to time.

14. COMPLIANCE WITH STATE LAWS. Lessee agrees that it will operate said mine in full compliance with all State mining laws.

15. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

16. LIABILITY AND NON-RESPONSIBILITY. Lessee will indemnify and hold Lessor harmless from and against all liability, claims, demands, injuries or damage done to persons or property caused by or in connection with its use of the above described premises and facilities, and the loading, hauling, and handling of the crude or finished product from the said premises, and all activities thereunder related, and Lessee shall, at his own expense, defend any and all actions based thereon and shall pay all charges of attorneys and all costs and other expenses arising therefrom.

17. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

18. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

19. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

19A. INCREASED REAL ESTATE PROPERTY TAXES. It is agreed that Lessee shall pay Eighty Eight Percent (88%) and Lessor shall pay Twelve Percent (12%) of any real estate property tax increases, over and above the present taxes that are due directly to mining operations or developments by the Lessee and not general real estate property tax increases.

20. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

21. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

LESSEE:

ANTAEUS RESOURCES CORPORATION

By _____

LESSOR:

_____

_____

_____

_____

_____

_____

_____

_____

STATE OF KENTUCKY)
: ss.
COUNTY OF CRITTENDON)

I, , a Notary Public, in and for, and residing in said County, in the State aforesaid, DO HEREBY CERTIFY, that EDWIN E. ROSE and GLADYS ROSE, his wife, personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledge that they signed, sealed and delivered the said instrument as their free and voluntary act for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal this 2 day of April A. D. 1971.

Rozella Gough

My Commission Expires:
3-19-72

STATE OF ILLINOIS Colorado)
: ss.
COUNTY OF HARDIN El Paso)

I, Mary Jean Davis , a Notary Public, in and for, and residing in said County, in the State aforesaid, DO HEREBY CERTIFY that THOMAS ROSE and VIVIAN ROSE, his wife, personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that they signed, sealed and delivered the said instrument as their free and voluntary act for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal, this 9th day of March, A. D. 1971

Mary Jean Davis

My Commission Expires:
July 25, 1971

STATE OF ILLINOIS Pennsylvania)
: ss.
COUNTY OF MADISON allegheny)

I, Reuel B. McCloud, a Notary Public, in and for and residing in said County, in the State aforesaid, DO HEREBY CERTIFY, that VELOISE ZELLER and WILLIAM ZELLER, her husband, personally known to me to be the same persons whose names are subscribed to the aforegoing instrument, appeared before me this day in person and acknowledged that the signed, sealed and delivered the said instrument as their free and voluntary act for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notaria seal this 27 day of March, A. D. 1971.

REUEL B. MCCLOUD NOTARY PUBLIC
WILKINSBURG, ALLEGHENY CO.
My Commission Expires
January 14, 1975

Reuel B. McCloud

My Commission Expires:

STATE OF ILLINOIS)
: ss.
COUNTY OF JEFFERSON)

I, Martha Ann Stapleton, a Notary Public, in and for, and residing in said County, in the State aforesaid, DO HEREBY CERTIFY that MAUDE E. WILLIAMS and VIRGIL H. WILLIAMS, her husband, personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that they signed, sealed and delivered the said instrument as their free and voluntary act for the uses and purposes therein set forth, including the release and waiver of the right of homestead.

Given under my hand and Notarial Seal, this 25th day of March, A. D. 1971.

Martha A. Stapleton

My Commission Expires: 12-19-74

STATE OF NEW YORK)
: ss.
COUNTY OF NEW YORK)

On the 5 day of February, 1971, before me, a Notary Public, personally appeared FRANCIS H. CABOT, personally known to me to be the Executive Vice-President of Antaeus Resources Corporation, the corporation described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Antaeus Resources Corporation.

Notary Public in and for said County and State

My Commission Expires:

JOHN J. TRASK JR.
Notary Public, State of New York
No. 31-4012420
Qualified in New York County
Commission Expires March 30, 1971

MINING LEASE WITH OPTION TO PURCHASE

THIS AGREEMENT, made and entered into this 22nd day of February, 1972, by and between J. J. Coan Company, Inc., a corporation duly incorporated under the laws of the State of Utah, International Fastener Research Corp., a corporation incorporated under the laws of the State of New York, and J. D. Quarant and Allene B. Quarant, his wife, of Rural Route #1, Golconda, Illinois, owners of certain mineral properties hereinafter described, and hereinafter referred to as "Lessor", and ANTAEUS RESOURCES CORPORATION, a corporation organized under the laws of the State of Delaware, hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all those certain mining properties belonging to Lessor situated in Hardin County, State of Illinois, to-wit:

> The South one-half (S$\frac{1}{2}$) of the Southeast one-quarter (SE$\frac{1}{4}$), except the North Fifteen (15) acres of the Southeast one-quarter of the Southeast one-quarter, in Section 30; and Northwest one-quarter (NW$\frac{1}{4}$) of the Northeast one-quarter (NE$\frac{1}{4}$), Section 31, all in T. 11 S., R. 8 E. of the Third Principal Meridian, containing 105 acres, more or less.

1. TITLE OF LESSOR. Lessor warrants and represents that he is the sole and exclusive owner of all minerals and mineral substances of every kind and character, including oil and gas, in, upon and underlying said lands, together with all rights and privileges apertaining thereto.

Lessor represents that he has not done or suffered anything whereby the said premises have been encumbered in any way whatsoever and that to the best of his knowledge the said mineral properties are free and clear from any right or claim of any other person or persons.

If Lessor owns a less interest in the above described mineral estate, or any part thereof, than its entirety, then the royalties and other considerations herein provided for shall be paid by Lessee only in the proportion the Lessor's interest bears to the whole and undivided mineral estate.

2. TERM. The primary term of this Lease shall be for a period of Eight (8) years from the date hereof. This Lease may be extended beyond the primary term for and so long thereafter as any mining, development or exploration is being conducted on the said properties.

3. RENTS AND ROYALTY. As consideration for the granting of this lease to Lessee, and until and if the hereinafter described Option to Purchase is exercised, Lessee hereby agrees to pay to the Lessor in the manner as herein provided, a percentage royalty based on the value of the ore at the mouth of the mine. The percentage royalty paid to Lessor shall be Ten percent (10%). Said royalty payments shall be due and payable within fifteen days after receipt by Lessee of the money from the sale of said ore; but in no event shall the payment of royalty be delayed more than 45 days from the time that ore is removed from the premises.

4. RENTAL PAYMENTS. The Lessee agrees to pay to the Lessor, as rental payments, Seven Hundred and Fifty ($750.00) Dollars for the first year this agreement is in effect. After the first year, and for each year thereafter that this agreement is in effect, Lessee shall pay to Lessor One Thousand and Five Hundred Dollars ($1,500.00) as annual minimum royalty. The first payment shall be due upon the signing date of this lease; subsequent payments are to be made on or before the anniversary date of this lease. In the event Lessee fails to make the rental payments within sixty (60) days after due, this lease is cancelled without any further notice due Lessee from Lessor.

5. CREDIT AGAINST FUTURE PRODUCTION. It is understood and agreed that any rental payments shall be credited against production royalties only in the year produced and not to be cumulative.

6. RECORDS. Lessor shall have the right to check weights as often as he deems necessary. Lessor shall be given duplicate copies of all ore weights as they are removed from the demised premises. In addition, the Lessor shall be supplied with a copy of the purchaser's invoices showing ore sales, weights and analysis.

7. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

8. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined timbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

9. INSURANCE. Lessee hereby agrees to carry adequate workmen's compensation insurance for the protection of all workmen employed on said mining premises and claims or in the mining operations. Lessee further agrees at all times during the term of this lease to carry $100,000 of public liability insurance for injury to persons and $50,000 of property damage insurance for property damaged on the premises.

10. TERMINATION. Lessee may cancel or terminate this lease upon sixty (60) days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee, and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

11. DEFAULT. If Lessee fails, refuses or neglects to perform the terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for thirty (30) days after notice to Lessee in writing, to rectify such default, Lessor or his agents may reenter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

12. ASSIGNMENT. All parties hereto agree and understand that all the rights of either party hereto may be assigned, and the privilege of assigning or subletting in whole or in part is expressly allowed, and all the covenants and agreements hereunder shall inure to, continue and be binding upon the heirs, legal representatives, successor and assigns of the parties hereto, but no change in the ownership of the land or assignment of royalties shall be binding on the Lessee until after the Lessee has been furnished with a written, recorded transfer or assignment, or a true copy thereof.

13. NOTICE. Any notice required to be given to Lessor hereunder shall be given to him by registered mail addressed to him at;

Mr. J. D. Quarant
Rural Route
Elizabethtown, Illinois 62931

or at such other address or addresses as he respectively may hereafter designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to it by registered mail and addressed to it at 345 Park Avenue, New York, New York 10022, or at such other address or addresses as it may designate in writing from time to time.

14. COMPLIANCE WITH STATE LAWS. Lessee agrees that it will operate said mine in full compliance with all State mining laws.

15. CHANGES IN LEASE. None of the covenants, terms or conditions of this lease shall in any manner be altered, waived, changed, or abandoned, except by a written instrument signed by the parties hereto.

16. LIABILITY AND NON-RESPONSIBILITY. Lessee will indemnify and hold Lessor harmless from and against all liability, claims, demands, injuries or damage done to persons or property caused by or in connection with its use of the above described premises and facilities, and the loading, hauling, and handling of the crude or finished product from the said premises, and all activities thereunder related, and Lessee shall, at his own expense, defend any and all actions based thereon and shall pay all charges of attorneys and all costs and other expenses arising therefrom.

17. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

18. TAXES. The parties hereto further agree that the assessed valuation of the demised lands herein for the taxable year of 1972 is for purposes hereinafter stated called the "BASE TAXABLE YEAR". The Lessor agrees to pay all taxes on the assessed valuations of said demised lands so lang as the assessed valuation does not exceed that of the 1972 "BASE TAXABLE YEAR". Any increase in assessments above the "BASE TAXABLE YEAR" which results in additional taxes on the demised premises shall be paid by the Lessee without credit toward the payment of rents and royalties due or hereinafter found to be due at any time during the life of this agreement or any renewals thereof. All other taxes, including severance taxes, value added taxes, resulting from mining operations shall be borne by the Lessee without credit toward the payment of rents and royalties due or hereinafter found to be due at any time while this agreement remains in effect.

19. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

20. OPTION TO PURCHASE. Lessee may elect to purchase the hereinbefore described mineral and mining rights together with all surface rights and other rights presently owned by Lessor. The election to purchase said land may be made by Lessee at any time during the primary term of eight (8) years, but not thereafter, and the purchase price therefore shall be One Hundred and Fifty Seven Thousand and Five Hundred Dollars ($157,500.00). Said election to purchase may be exercised by Lessee by giving written notice thereof to Lessor, as provided in Paragraph 13 of this Lease-Option. At the time such notice is given, Lessee shall deposit the sum of One Hundred and Fifty Seven Thousand and Five Hundred Dollars ($157,500.00) in escrow with the Citizens Bank and Trust Company, Paducah, Kentucky, the same to be held by said bank for delivery to Lessor, subject to perfection of title thereto as herein provided for.

The Lessor, upon receiving notice from Lessee of this election to purchase said lands and its deposit of said purchase money in escrow, shall thereupon make, execute and deliver to said escrow agent their good and sufficient Quit Claim Deed, conveying said land and all mineral and mining rights therein owned by Lessor to Lessee, its successors and assigns. The Quit Claim Deed shall be in substantially the same language as Aluminum Company of America granted the described premises to the Lessor herein.

Lessor shall promptly procure and deliver to Lessee an abstract of title to said lands so purchased showing good and merchantable title to said Lessor and said lands and mining rights, and the same to be free and clear of all liens and encumbrances.

Lessee shall promptly examine said abstract, and if any objections are found thereto, the same shall be set out in writing and delivered to said Lessor, whereupon Lessor agrees to correct all valid objections to said title, and if it becomes necessary to adequately correct such defects said Lessor agrees to bring suit to Quiet Title to said lands and during the pendency thereof and until final judgment in said proceedings, Lessee may continue to occupy and exercise his right to said lands as herein provided for.

21. PARTIES. Whenever in this agreement the masculine gender is used, it shall include the feminine gender, and the singular shall include the plural.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease With Option To Purchase the day and year first hereinabove written.

LESSEE:

Antaeus Resources Corporation

By_____
John L. Carroll
Vice President, Mining

ATTEST:

_____
Secretary

LESSOR:

_____
J. D. Quarant

_____
Allene B. Quarant

J. J. Coan Company, Inc.

BY: _____
B. J. Coan, President

Attest:

_____
Secretary

International Fastener Research Corp.

BY: _____
David Weisz, President

Attest:

_____
Secretary

STATE OF NEW YORK)
) ss
COUNTY OF NEW YORK)

On the _____ day of _____, 197__, before me, a Notary Public, personally appeared John L. Carroll, personally known to me to be a Vice-President of Antaeus Resources Corporation, the corporation described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of Antaeus Resources Corporation.

_____
Notary Public in and for said County and State

My commission expires:

STATE OF Illinois)
) ss
COUNTY OF HARDIN)

On the 22nd day of February, 1972, before me, a Notary Public personally appeared J. D. Quarant and Allene B. Quarant his wife, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed same.

Grace Fae Volkert
Notary Public in and for said County and State

My commission expires:
June 1, 1973

STATE OF Utah)
) ss
COUNTY OF Salt Lake)

On the 28th day of February, 1972, before me, a Notary Public, personally appeared B. J. Coan, personally known to me to be President of J. J. Coan Company, Inc., the corporation described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of J. J. Coan Company, Inc.

Anne M. Harris
Notary Public in and for said County and State

My commission expires: 8-2-72

State OF California)
) ss
COUNTY OF Los Angeles)

On the 1st day of March, 1972, before me, a Notary Public, personally appeared David Weisz, personally known to me to be President of International Fastener Corp., the corporation described in and which executed the foregoing instrument, and he acknowledged that he executed the same as the act and deed of International Fastener Corp.

OFFICIAL SEAL
HELEN SPELTON
NOTARY PUBLIC - CALIFORNIA
PRINCIPAL OFFICE IN
LOS ANGELES COUNTY
My Commission Expires Feb. 21, 1973

Helen Spelton
Notary Public in and for said County and State

My commission expires:

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 922
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

October 29, 1987

Re: OME 6873 (fluorspar, et al)
Karlin, Goelet, and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin Co., Illinois
Contract 2306

Mr. John Lee Carroll, Manager
Silver Resources Corporation
515 Madison Ave., 32nd floor
New York, NY 10022

Dear Mr. Carroll:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely,

J. William Hasler

J. William Hasler, Chief
Office of Minerals Exploration

Rec'd 12/1/87
OME

Form MME 63
(May 1970)

REQUEST FOR INFORMATION ON CERTIFIED PROJECT OR PROJECT UNDER ROYALTY AGREEMENT

1. Since February 12, 1986, has there been a change in ownership, lease, or sublease? *If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before.* Yes [X] No [ ]

In 1987, leases and properties pertaining to this project were transferred to Hicks Dome Corporation, an Illinois corporation whose address is P.O. Box 3, Herod, Illinois 62947 and whose ownership is substantially the same as the ownership of Hicks Dome Account.

2. Since Since Feb. 12, 1986, has there been any production from the land subject to the contract? Yes [ ] No [X]

A. If so and it was shipped, give quantity, value, and name and address of purchaser.

Purchaser (*name and address*)	Quantity	Value

B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity (*tons*)	Estimated Grade	Location
Ore			
Concentrates			
Other			

3. Since Feb. 12, 1986, has any production been transported through workings (*see of contract*)? Yes [ ] No [X]

If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name John Lee Carroll	*Title*
Address 515 Madison Avenue New York, N.Y. 10022	*Date* November 24, 1987

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 922
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

October 29, 1987

Re: OME 6873 (fluorspar, et al)
Karlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin Co., Illinois
Contract 2306

Mr. John Lee Carroll, Manager
Silver Resources Corporation
515 Madison Ave., 32nd floor
New York, NY 10022

Dear Mr. Carroll:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely,

J. William Hasler

J. William Hasler, Chief
Office of Minerals Exploration

Form MME 63
(May 1970)

REQUEST FOR INFORMATION ON CERTIFIED PROJECT OR PROJECT UNDER ROYALTY AGREEMENT

1. Since February 12, 1986, has there been a change in ownership, lease, or sublease? *If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before.* Yes [X] No [ ]

In 1987, leases and properties pertaining to this project were transferred to Hicks Dome Corporation, an Illinois corporation whose address is P.O. Box 3, Herod, Illinois 62947 and whose ownership is substantially the same as the ownership of Hicks Dome Account.

2. Since February 12, 1986, has there been any production from the land subject to the contract? Yes [ ] No [X]

A. If so and it was shipped, give quantity, value, and name and address of purchaser.

Purchaser (*name and address*)	Quantity	Value

B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity (*tons*)	Estimated Grade	Location
Ore			
Concentrates			
Other			

3. Since February 12, 1986, has any production been transported through workings (*see of contract*)? Yes [ ] No [ ]

If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name John Lee Carroll	*Title*
Address 515 Madison Avenue New York, N.Y. 10022	*Date* November 24, 1987

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 939
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

Sept 24, 1987

~~August 6, 1986~~

Re: OME 6873 (fluorspar, etc.)
Gilbert Kerlin, Robert C. Goelet,
Francis Goelet d/b/a
Hicks Dome Property
Hardin County, Illinois
Contract 2306

SEP 16 1986

Mr. John Lee Carroll
Silver Resources Corporation
515 Madison Ave., 2nd floor
New York, NY 10022

Dear Mr. Carroll:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely,

J. William Hasler

J. William Hasler, Chief
Office of Minerals Exploration

JWH:js

Form MME 63
(May 1970)

REQUEST FOR INFORMATION ON CERTIFIED PROJECT OR PROJECT UNDER ROYALTY AGREEMENT

1. Since June 17, 1985, has there been a change in ownership, lease, or sublease? *If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before.* Yes ☐ No ☒

2. Since June 17, 1986, has there been any production from the land subject to the contract? Yes ☐ No ☒

A. If so and it was shipped, give quantity, value, and name and address of purchaser.

Purchaser *(name and address)*	Quantity	Value

B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity *(tons)*	Estimated Grade	Location
Ore			
Concentrates			
Other			

3. Since June 17, 1985, has any production been transported through workings *(see of contract)*? Yes ☐ No ☒

If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name	Title
John Lee Carroll	Manager
Address	**Date**
515 Madison Ave., New York, N.Y. 10022	9/11/86

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 939
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

August 6, 1986

Re: OME 6873 (fluorspar, etc.)
Gilbert Kerlin, Robert C. Goelet,
Francis Goelet d/b/a
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Mr. John Lee Carroll
Silver Resources Corporation
515 Madison Ave., 2nd floor
New York, NY 10022

JWH
SEP 16 1986

Dear Mr. Carroll:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely,

J. William Hasler

J. William Hasler, Chief
Office of Minerals Exploration

JWH:js

Form MME 63
(May 1970)

REQUEST FOR INFORMATION ON CERTIFIED PROJECT OR PROJECT UNDER ROYALTY AGREEMENT

1. Since June 17, 1985, has there been a change in ownership, lease, or sublease? *If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before.* Yes ☐ No ☒

2. Since June 17, 1986, has there been any production from the land subject to the contract? Yes ☐ No ☒

A. If so and it was shipped, give quantity, value, and name and address of purchaser.

Purchaser *(name and address)*	Quantity	Value

B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity *(tons)*	Estimated Grade	Location
Ore			
Concentrates			
Other			

3. Since June 17, 1985, has any production been transported through workings *(see of contract)*? Yes ☐ No ☒

If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name	Title
John Lee Carroll	Manager
Address	**Date**
515 Madison Ave., New York, N.Y. 10022	9/11/86

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 939
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY REFER TO:

June 13, 1986

Mr. John L. Carroll
Room 4120, 345 Park Avenue
New York, NY 10022

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Mr. Carroll:

As you are probably aware, the U.S. Geological Survey and the state geological surveys of Illinois, Kentucky, Missouri, and Indiana are planning to start a geological, geophysical, and geochemical study of the resource potential of the Paducah 1° X 2° quadrangle, as a follow-on to our recent studies of the Rolla and other quadrangles. The project is formally scheduled to begin next October and to be completed in four years.

As you may recall from our work in the Rolla quadrangle, our approach on these 1° X 2° projects is not the classical detailed district study, but rather a regional synthesis of data leading to a very broad assessment of favorable geologic terranes in terms of the appropriate mineral-deposit models. Last fall in Springfield we enjoyed a preliminary discussion of the Paducah project with Joe Porter, and now we would like to pursue that discussion with you, specifically in regard to what we might do along the line of petrologic and geochemical analysis of some of the OME Hicks Dome cores as part of the regional synthesis.

Several of us from the USGS who will be working on the Paducah project will be meeting with some of the Illinois and other state survey people in Champaign on July 1-2, and we wonder if it would be possible for you to join us for part of one of those days, to hear about our tentative plans and to discuss what our respective roles might be and how we might implement them to our mutual benefit. We will be happy to modify our agenda to suit your convenience.

Sincerely yours,

J. William Hasler

J. William Hasler
Chief, Office of Minerals Exploration

cc: J. W. Baxter
J. J. Eidel
W. P. Pratt, Project Coordinator

bcc: G. H. Allcott
H. A. Torurtelot
C. H. Thorman
A. V. Heyl

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 939
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY
REFER TO:

May 29, 1986

Mr. John Lee Carroll, Mgr.
Silver Resources Corporation
515 Madison Avenue
32nd floor
New York City, N.Y. 10022

Re: OME 6873 (fluorspar, et. al.)
Karlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Harden County, Illinois
Contract 2306

Dear Mr. Carroll:

Your letter updating us on the status of the subject property was received February 25, 1986. It was good to know that the core and cuttings obtained as a result of the subject exploration work at Hicks Dome have been appropriately stored according to the terms of the contract.

As you know, the U. S. Geological Survey is preparing to do additional detailed geologic work pertaining to Hicks Dome in conjunction with the work of the Illinois Geological Survey during the preparation of the Paducah, Illinois 2° geologic map, beginning this summer.

Mr. Jim Baxter, geologist, Illinois State Geological Survey will proceed with detailed logging and chemical analysis of the drill core as well as mapping of Hicks Dome early this summer. His work will be in conjunction with your work and that of Mr. Joseph Porter, your resident geologist.

We appreciate your continued cooperation and believe this work will be of benefit to the Survey as well as the Hicks Dome project.

Very truly yours,

J. William Hasler, Chief
OFFICE OF MINERALS EXPLORATION

cc: G. H. Allcott
H. A. Tourtelott
C. H. Thorman
R. D. Trace
A. V. Heyl
J. Baxter, Illinois Geological Survey
J. Eidell, Illinois Geological Survey

JOHN LEE CARROLL
515 MADISON AVENUE
32ND FLOOR
NEW YORK, N.Y. 10022

RECEIVED
FEB 25 1986
J.W. Hasler

(212) 688-3353

February 19, 1986

Mr. J. William Hasler
Office of Minerals Exploration
United States Department of the Interior
Geological Survey
Box 25046 M.S. 939
Denver Federal Center
Denver, CO 80225

Re: OME (fluorspar, et al)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Mr. Hasler:

Thank you for your letter of February 12th, regarding the above contract.

To answer your questions: 1. The property is not currently under commercial development. Conditions in the fluorspar industry have been very depressed for a number of years, and there is little or no demand for thorium at the present time. The remaining minerals you mention would qualify commercially as by-products. 2. A very limited amount of metallurgical work was done with respect to fluorspar and barite, but nothing with respect to the other minerals. 3. The core and cuttings have been appropriately stored.

I don't know what purpose would be served by your visiting the property at this time, but if you wish to do so, please contact me at the above address.

Sincerely,

John Lee Carroll

JLC:grv

Haslar

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 939
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY
REFER TO:

BRANCH OF CENTRAL MINERAL RESOURCES

February 12, 1986

Mr. John Lee Carroll, Manager
Silver Resources Corporation
515 Madison Avenue, 32nd floor
New York City, New York 10022

Re: OME 6873 (fluospar, et al)
Kerlin, Goelet and Goelet d/b/a/
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Mr. Carroll:

Last year we received the return of our copy of Form MME-63 informing us that the property referred to above has not changed in ownership, lease, or sublease, and that there has been no production on the Hicks Dome Property.

It is known that Hicks Dome contains one of the largest resources of thorium in the United States, as well as a large resource of niobium, rare earths, beryllium, and fluorite. Is the property being developed so as to mine multi-products or has it remained essentially the same since April 1976, the date of our Certification of Discovery?

Has there been any metallurgical work completed on the potential ore to bring the property into production?

Part of the reason we entered into an exploration program with you was to expand the potential occurrence of thorium, niobium, rare earths, beryllium, and fluorite in the Hicks Dome's highly unusual type of mineralization. Our country, as you well know, is poorly developed in the readily available resources of these particular minerals.

Twelve holes were completed - OME 1 through OME 12, totalling 29,339 feet of which 3,670 feet were rotary drilled with 25,669 feet cored. We assume that you are keeping the core and cuttings as prescribed in the contract; that is, keeping them stored in boxes identified with the hole number, with markers in the core sections indicating the depths represented. This was to be done in anticipation that we might need them at a later date.

Your thoughts and plans concerning Hicks Dome and its potential will be greatly appreciated. I would like to visit the property later on in the year.

Thank you for your cooperation.

Sincerely yours,

J. William Hasler

J. William Hasler, Chief
Office of Minerals Exploration

JWHasler:js

Copies to: G. H. Allcott
H. A. Tourtelot
C. H. Thorman
R. D. Trace
A. V. Heyl

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 939
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY
REFER TO:

August 2, 1985

Memorandum

To: The File

From: Chief, Office of Minerals Exploration

Subject: Illinois DMEA Dockets

About two weeks ago a request was made through Wanda West, U.S. Bureau of Mines, Minneapolis, Minnesota, to furnish the Illinois State Geological Survey with copies of our DMEA files, reports, etc. on activities in the State of Illinois from 1950 through fiscal 1958.

Our files here in Denver showed only two DMEA dockets. Old DMEA reports showed eight Illinois dockets, two of which went to contract. A number of other areas were examined but only scattered data is now available after having talked with Bob Trace and Dewey Amos, former USGS geologists who were involved in DMEA examinations at that time.

Robert Laurence, former executive officer, Regions 8 and 4, passed away last year, consequently his files are not now available to us.

James Baxter, Illinois Geological Survey was contacted and he will talk to Jim Bradbury, formerly with the Illinois State Survey, who also was heavily involved in DMEA work, as well as mapping of the Illinois-Kentucky Fluorspar District. Bob Trace, 412 Eagle Street, Princeton, Kentucky, gave me information on several properties in the district and is in the process of turning over his notes and records to this office for filing as he is now retired and no longer needs this data.

Attached is a list of DMEA and OME dockets obtained from Bob Trace and Allen Heyl.

J. W. Hasler

JWH:js

Attachment

cc: G. H. Allcott
H. A. Tourtelot
C. H. Thorman

DMEA AND OME DOCKETS - STATE OF ILLINOIS

Docket No.	Contract No.	Mineral	Mining Company	Property
DMA 827		Fluospar		Rosiclare Mine, Hardin Co., Ill. Sec. 32, T12N, R8E
DMEA 1321		"	A. S. Lay, Inc.	W½ NE¼ Sec. 22 Pope Co., Ill. No. Hiway 146E Grand Pierre Creek
DMEA 2828	E549	"	Minerva Oil Co.	Fairbairn Tract Hardin & Pope Cos., Ill. Certified - pd. in full
DMEA 3321		"	Goose Creek Mng. Co.	Patton Property Minerva took prod. ore Don Saxbe Hardin Co., Ill.
DMEA 3338		"	Ozark Mahoning Co.	Lloyd Gibson Tract Field Team Report - denial
DMEA 3523		"		Baldwin-Wallace Tract No contract. Pope Co. T11S, R7E, Sec. 22 SE¼ SE¼ Gaylord Wallace
DMEA 3855	E914	"	Hicks Dome	Hicks Dome Hardin Co., Ill.
DMEA 4284				Dodd Gibson Ingram Tract, Hardin Co., Ill.
DMEA 4358) DMEA 4359) DMEA 4360)		"	New Jersey Zinc	Hardin & Pope Cos., Ill. ABC R8&9E, T11S
OME 6873	2306	Fluospar, beryl- lium & rare earths	Kerlin, Goelet & Goelet d/b/a Hicks Dome Acct.	OME-HAMP Holes Hicks Dome Property Hardin Co., Ill.

8/2/85

Ref of Paper 933
Wally Pratt

3. Complex skarns among which are iron and zinc deposits in the Precambrian of New Jersey, Pennsylvania, and southeastern and northern New York, that contain fluorite, fluorapatite, rare-earth fluocarbonates, and in places abundant chondrodite, norbergite, and humite.
4. Fluorine-bearing tactites along granite and pegmatite contacts, and contact iron deposits next to Triassic diabase in Pennsylvania. Fluorite and topaz are the main fluorine-bearing minerals. Magnetite, scheelite, wolframite, molybdenite, helvite, chalcopyrite, garnet, and rare-earth and thorium minerals are associated with the fluorine minerals. One contact zone on Long Island, Maine, has yielded a small quantity of fluorite for apothecary shops.

Most deposits are veins which were formed at intermediate temperature. A few fluorite-quartz veins in the Cheshire County-Westmoreland district of southwestern New Hampshire have produced fluorspar. Complex fluorite-galena-sphalerite-quartz veins in the Faber, Va., area have also been productive. Other intermediate-temperature veins are silver-lead-copper-zinc-fluorspar-barite veins of the Connecticut Valley in Connecticut and Massachusetts and near Phoenixville, Pa. Somewhat more complex veins occur on Deer Isle, Maine, and at Thomaston Dam, Litchfield, Conn.

Most of the fluorspar deposits in the Central and Eastern parts of the United States are low-temperature veins, mantos, breccia bodies, stockworks, pipes, and disseminated deposits of several types of origin.

The most abundant deposits and some of the largest known economic concentrations of fluorspar are low-temperature vein and manto deposits in the Mississippi Valley and in the Appalachian Valley and Ridge province near related zinc deposits. Of these, the largest concentration of fluorspar in the Nation is in the Illinois-Kentucky district which contains Mississippi Valley-type (low-temperature vein and manto) deposits. Other Mississippi Valley-type deposits that have produced or may contain important resources are in the Central Tennessee district, the Cumberland River vein area, the Central Kentucky district, and the Rossie-Lowville, N. Y., area.

Appalachian Valley and Ridge province deposits are numerous and occur from Alabama to Pennsylvania (Van Alstine and Sweeney, 1968). Most of these deposits (Appalachian type) are irregularly shaped to blanketlike breccia bodies or are clusters of discontinuous veins, in both Cambrian and Ordovician carbonate rocks. A few deposits are fissure veins and disseminations in quartzite, shale, and carbonate rocks. By far the largest and potentially most important district in the Appalachian belt is the Sweetwater district in eastern Tennessee south of Knoxville. Farther east near the Tennessee-North Carolina State boundary are the adjoining Del Rio, Tenn., district and similar Hot Springs, N. C., district; the former produced barite and a small quantity of fluorspar from breccia bodies, disseminations, and fissure veins in quartzite and crystalline rocks. A small tonnage has been produced from barite-fluorite breccia bodies that constitute the Gilley deposit in northeastern Alabama.

Disseminations of fluorite distributed widely in vugs and thin veinlets along with calcite, dolomite, barite, celestite, and sphalerite are found in central Pennsylvania, western New York along the south shore of Lake Ontario, northeastern Iowa, northwestern Ohio, and in the Serpent Mound cryptoexplosion structure in southeastern Ohio (Heyl, 1968). Such deposits may have been formed by simple warm connate brines or cold meteoric waters, or they may in places indicate undiscovered districts of the geologically more complex Mississippi Valley type or Appalachian type.

Residual or placer deposits derived from underlying bedrock deposits are known in a few places. Residual gravel spar deposits have been mined in western Kentucky, central Kentucky, and central Tennessee, but are unknown in the Appalachian region. The Streeter topaz placer in the Llano uplift of central Texas was described by Paige (1911), although a bedrock source has not been found.

Several of the districts and deposits in the Central and Eastern United States are described in more detail below, State by State, because of their resource potential or geologic interest. For each State, deposits with the greatest commercial potential are described first, followed by deposits of geologic interest, or of potential byproduct production of fluorite. Other possible fluorine sources such as apatite, rare-earth fluocarbonates, and fluosilicates are described last.

ILLINOIS-KENTUCKY

ILLINOIS-KENTUCKY FLUORSPAR DISTRICT

By R. D. Trace

HICKS DOME

More than three-fourths of the fluorspar produced in the United States has come from the Illinois-Kentucky district. Substantial quantities of zinc and some lead and barite also have been produced, mostly as a byproduct of fluorspar mining. The district is in Hardin and Pope Counties in southeasternmost Illinois, and adjacent Crittenden, Livingston, and Caldwell Counties of western Kentucky (fig. 23). Nearly all the mines are within the boundaries of 16 7½-minute quadrangles aggregating nearly 1,000 mi² (2,500 km²). The Illinois Geological Survey has published geologic maps of the Illinois part of the district, and the U.S. Geological Survey, in cooperation with the Kentucky Geological Survey, in 1972 has published geologic maps for most of the Kentucky quadrangles.

The earliest mining in the district was for lead at the Columbia mine, Crittenden County, Ky., in 1835 (Ulrich and Smith, 1905, p. 115). Lead mining started shortly thereafter in Illinois (Norwood, 1866, p. 366–372). From 1835 to the early 1870's, little fluorspar was mined. Only small amounts were produced from the early 1870's to about 1890, when an expanded market was created by the development of the basic open-hearth steel furnace in which fluorspar was used for flux. Production since 1890 has been erratic but in general has risen. Production during World Wars I and II and the Korean conflict rose sharply, but in 1953–58, because of rising imports, production in the district decreased. Production has risen in recent years and probably will continue to increase in the near future. Production figures are summarized in the following table.

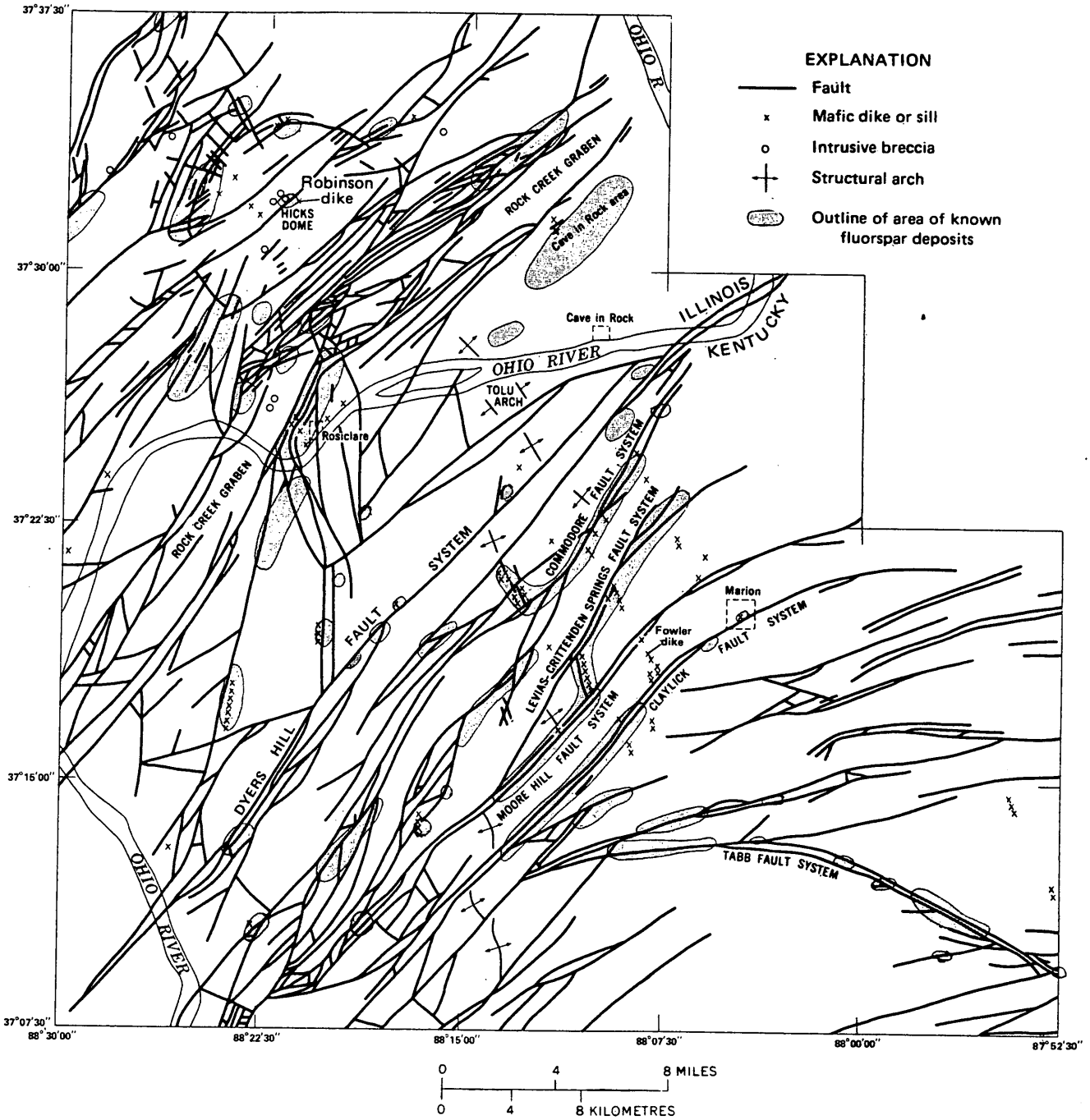


FIGURE 23.—Major structural features, igneous rocks, and distribution of known fluorspar deposits, Illinois-Kentucky fluorspar district. Compiled from published and unpublished geologic maps, 1962–72, by Illinois Geological Survey and U.S. Geological Survey.

Fluorspar production from Illinois and Kentucky
[From U.S. Bur. Mines Minerals Yearbooks unless otherwise noted]

Years	Tons
Illinois	
Through 1963	6,163,345
1964	127,454
1965	159,140
1966	176,175
1967	210,207
1968	188,325
1969	88,480
1970	148,208
1971	[1]141,000
Total	7,402,334
Kentucky	
Through 1963	3,016,980
1964	38,214
1965	31,992
1966	28,725
1967	32,952
1968	17,050
1969	[2]10,000
1970	[2]5,000
Total	3,180,913

[1]U.S. Bur. Mines estimate.
[2]Estimate by R. D. Trace.

Until the early 1930's almost the entire production was from vein ores. Since then, the amount of ore produced from bedding-replacement deposits near Cave in Rock, Ill., increased and so by the middle to late 1960's bedding-replacement ore probably constituted more of the Illinois production than did vein ore. The rise in the bedding-replacement to vein-ore ratio was in part due to the depletion of some of the large vein deposits near Rosiclare. Within the last few years the Illinois production from veins has increased and may soon equal the production from bedding-replacement deposits. In Kentucky, nearly all production has been from veins, although a substantial deposit of bedding-replacement ore near Joy has been known since the 1950's and was put into production in 1970 and was mined until 1973.

GEOLOGIC SETTING

Sedimentary formations that crop out in the district range in age mostly from Late Devonian through Early Pennsylvanian; where mining has been concentrated, the rock units at the surface are the Meramecian and Chesterian Series of Mississippian age. A small amount of unconsolidated Cretaceous and Tertiary sand, silt, clay, and gravel and Quaternary loess and alluvium is present locally.

The geologic column of exposed formations in the Illinois part of the district was summarized by Grogan and Bradbury (1968, fig. 2) (fig. 24). A slightly different column applicable only to the Kentucky part of the district is shown in figure 25. The lithologies in Illinois and Kentucky are generally similar but some differences in nomenclature are evident.

Most of the vein ores occur where the wallrocks are of either early Chesterian or late Meramecian age (early Chesterian and late Valmeyeran in fig. 24). The three principal bedded ore horizons also are either in the lower part of the Chesterian Series or in the upper part of the Meramecian Series.

Numerous intrusive mafic-alkalic dikes and a few sills are present in the district, and in addition in Illinois breccia forms dikelike or pluglike bodies (fig. 23). The mafic dikes and sills have been called mica-peridotites and lamprophyres; most are so highly altered as to defy precise classification. The dikes and sills are mostly dark gray to dark greenish gray, finely crystalline, and commonly porphyritic. They are composed mainly of dolomite, calcite, serpentine, chlorite, and generally phlogopitic biotite. Small quantities of magnetite, leucoxene, marcasite, fluorapatite, garnet, perovskite, and goethite are commonly present. Olivine and pyroxene are primary constituents but in a majority of the dikes these minerals mostly have been altered to serpentine (Clegg and Bradbury, 1956; Koenig, 1956; Trace, 1962b). Rarely, the mafic rocks are medium to coarsely crystalline (sample no. 197 in Zartman and other, 1967), light gray, and contain no chlorite or serpentine. Oesterling (1952, p. 324) described light-green dike material composed "nearly entirely of fine-grained calcite. The phlogopite has been completely replaced by calcite; there is no indication that olivine or pyroxene phenocrysts were ever present."

Chemical and semiquantitative spectrographic analyses of samples of the Illinois dikes and sills were reported by Bradbury (1962) and chemical analyses of samples of Kentucky rocks were given by Koenig (1956). The highly weathered Robinson dike near Hicks dome, Illinois, (Bradbury and others, 1955, p. 8) and similarly altered material from the Fowler dike in the east-central part of the Salem quadrangle, Kentucky (Trace, 1962a) were sampled in 1955. Semiquantitative spectrographic analyses of the samples showed that the Robinson dike contains much larger quantities of rare earths than does the Fowler dike (see fig. 23), as shown in the following table.

Semiquantitative spectrographic analyses of weathered mafic dikes, Illinois and Kentucky
[Analyses by Mona Frank, U.S. Geol. Survey, Sept. 1955]

Percent	Robinson dike (Near Hicks dome, Illinois)	Fowler dike (East-central part of Salem quadrangle, Kentucky)
>10	Si	Si
5–10	Fe Al	Fe Al
1–5	Ti Mg	Mg Ca
0.5–1	Ca K Na	Ti K
0.1–0.5	Ni Y Ba Ce	Ni Cr
0.05–0.1	Mn Nd	.....
0.01–0.05	La Sr V Co Cr Zr Cu	Mn Ba Na Sr V Cu
0.005–0.01	Nb Zn Ga	Co Ga
0.001–0.005	Yb Pb Mo Sc Be	La Nb Y Pb Nd Zr Mo Sc
0.0005–0.001	.....	.....
0.0001–0.0005	Ag	Yb Ag Be

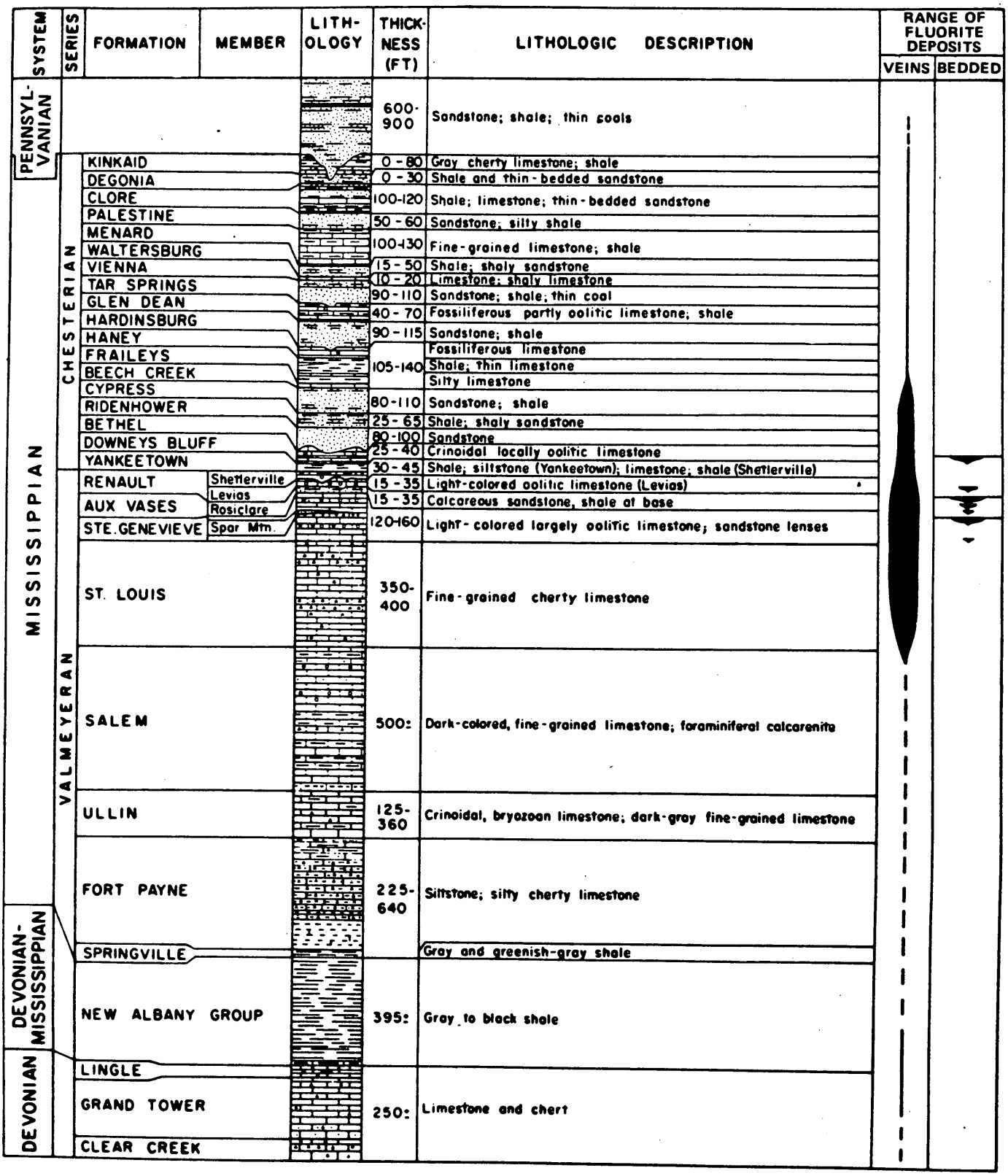
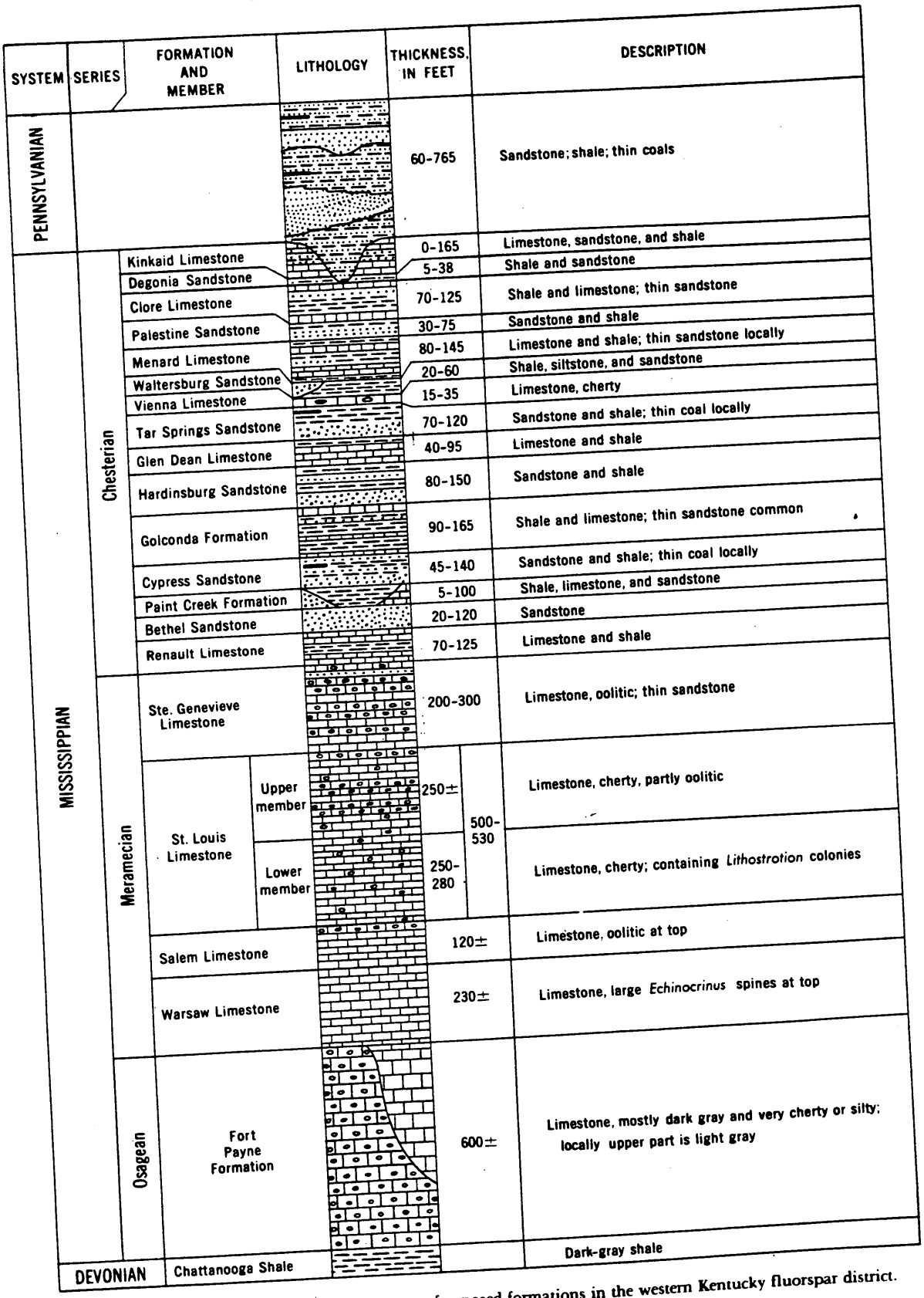


FIGURE 24.—Stratigraphic column of exposed formations in the Illinois-Kentucky fluorspar district. From Grogan and Bradbury (1968, fig. 2).



SYSTEM	SERIES	FORMATION AND MEMBER		THICKNESS, IN FEET		DESCRIPTION
PENNSYLVANIAN				60-765		Sandstone; shale; thin coals
MISSISSIPPIAN	Chesterian	Kinkaid Limestone		0-165		Limestone, sandstone, and shale
		Degonia Sandstone		5-38		Shale and sandstone
		Clore Limestone		70-125		Shale and limestone; thin sandstone
		Palestine Sandstone		30-75		Sandstone and shale
		Menard Limestone		80-145		Limestone and shale; thin sandstone locally
		Waltersburg Sandstone		20-60		Shale, siltstone, and sandstone
		Vienna Limestone		15-35		Limestone, cherty
		Tar Springs Sandstone		70-120		Sandstone and shale; thin coal locally
		Glen Dean Limestone		40-95		Limestone and shale
		Hardinsburg Sandstone		80-150		Sandstone and shale
		Golconda Formation		90-165		Shale and limestone; thin sandstone common
		Cypress Sandstone		45-140		Sandstone and shale; thin coal locally
		Paint Creek Formation		5-100		Shale, limestone, and sandstone
		Bethel Sandstone		20-120		Sandstone
		Renault Limestone		70-125		Limestone and shale
	Meramecian	Ste. Genevieve Limestone		200-300		Limestone, oolitic; thin sandstone
		St. Louis Limestone	Upper member	250±	500-530	Limestone, cherty, partly oolitic
			Lower member	250-280		Limestone, cherty; containing *Lithostrotion* colonies
		Salem Limestone		120±		Limestone, oolitic at top
		Warsaw Limestone		230±		Limestone, large *Echinocrinus* spines at top
	Osagean	Fort Payne Formation		600±		Limestone, mostly dark gray and very cherty or silty; locally upper part is light gray
DEVONIAN		Chattanooga Shale				Dark-gray shale

FIGURE 25.—Generalized stratigraphic column of exposed formations in the western Kentucky fluorspar district.

In the last two decades, many more dikes and sills have been found principally because of the large amount of diamond drill exploration. A few new occurrences also have been found from surface mapping (Amos, 1966; Trace, 1966); mafic rock is difficult to find in surface outcrop, however, because a freshly exposed outcrop decomposes within a few years and becomes difficult to recognize. Also, the mafic rock material appears fresh and superficially resembles dark-gray limestones where exposures are continuously washed clean such as on Claylick Creek near the eastern edge of the Salem quadrangle (Trace, 1962a).

Numerous breccias and breccia "dikes" have been mapped in the Illinois part of the district (Baxter and Desborough, 1965; Baxter and others, 1967) and have been described in some detail (Clegg and Bradbury, 1956; Brown and others, 1954). According to Baxter and Desborough (1965, p. 287), "The breccias consist of angular to subrounded fragments of sedimentary, metamorphosed sedimentary, and igneous rocks in a matrix of finely ground rock and mineral fragments. The mineral fragments include quartz, pyroxene, augite, hornblende, apatite, mica, and feldspar." Grogan and Bradbury (1968, p. 376) identified fine-grained nepheline-feldspar rock in one of the breccias.

Many of these breccias are inferred to be pipes or small stocks, roughly circular or elliptical in plan and as much as 1,000 feet (300 m) in diameter. More commonly the breccias are vertical or steeply dipping dikelike bodies.

Unusual mineralization occurred in many of the breccias, both on the surface and to depths of over 2,000 feet (600 m) (Brown and others, 1954, p. 897–900; Heyl and others, 1965, p. B11; Bradbury, 1962, p. 6–8; Trace, 1960; Hall and Heyl, 1968). Minerals present are rare-earth-bearing fluorite, sphalerite, galena, barite, monazite, bertrandite, florencite, calcite, quartz, pyrite, brookite, yttroparisite(?), biotite, rutile, xenotime, apatite; beryllium, niobium, and zirconium are present in more than normal concentrations.

Until the early 1960's, the dikes, sills and breccias could be dated from stratigraphic relations only as post-Middle Pennsylvanian. In 1967 Zartman and others (p. 860–861) studied samples of biotite and hornblende from the dikes, sills, and breccias; on the basis of radio-isotope data they reported that "All the ages lie within experimental uncertainty of each other and give an average Early Permian age of 267 million years."

Wallrock alteration associated with vein deposits occurred along faults. Silicification of wallrock was the most striking change. Where Chesterian sandstone comprises the wallrock, sandstone close to or within the fault zone is extremely dense and commonly makes outcrops which are called "quartz reefs" or quartzite. Indeed, fragments of quartzite in places provide the only evidence of the surface trace of faults.

The alteration of limestone wallrocks generally was slight to moderate. In places numerous small doubly terminated quartz crystals and small masses of chalcedony have been reported where limestone is adjacent to a vein (Hardin, 1955, p. 24; Trace, 1962b, p. 17; Trace, 1954, p. 70). Fragments of dolomitic limestone, which is relatively common in the country rocks of the area, are present within the veins. No secondary dolomitization of the wallrocks of vein deposits has been reported.

Hall and Heyl (1968. p. 661) described visible wallrock alteration as much as 100 feet (30 m) laterally from bedding-replacement deposits. According to them, alteration included solution thinning of strata, silicification, dolomitization, and clay mineral alteration. Brecke (1962, p. 525–530) described the alteration of country rock, mostly within the mineralized zones, as decalcification, dolomitization, and silicification.

According to Heyl and Brock (1961, p. D3),

> The Illinois-Kentucky mining district is centered in the most complexly faulted area in the central craton of the United States. Structural studies suggest that the mining district lies within a collapsed, block-faulted, sliced, and partly rotated domal anticline that is located at and near the intersections of several major fault lineaments.

(See fig. 26.) Prominent fault zones that intersect at the district are the east-trending Cottage Grove-Rough Creek-Shawneetown system—coinciding with Heyl's (1972) 38th-Parallel lineament—and the northeast-trending New Madrid fault zone.

Within the fluorspar district (fig. 23) the rocks are complexly broken by a series of steeply dipping to vertical normal or gravity faults that trend dominantly northeast and divide the area into a series of elongated northeast-trending blocks. Many cross-faults that trend north to northwest are occupied in places by mafic dikes. Near the east edge of the Kentucky part of the district, the faults trend more nearly east; and radial and arcuate faults are present around Hicks dome.

Hicks dome is a structural high with about 4,000 feet (1,200 m) of vertical uplift that is centered in the southwest part of the Karbers Ridge quadrangle (Baxter and Desborough, 1965). Brown, Emery, and Meyer (1954) described the dome as an incipient cryptovolcanic structure, on the basis of breccias (in an oil test hole and nearby at the surface), arcuate faults, and unusual mineralization. As a result of an aeromagnetic survey, McGinnis and Bradbury (1964, p. 11) stated that: "Hicks Dome is not underlain by a laccolithic intrusion. * * * A broad magnetic anomaly of relatively low intensity centered about 5½ miles [9 km] northeast of Hicks Dome and the featureless configuration of contour lines around the anomaly suggest a large igneous body overlain by a thick sedimentary rock section."

The southeasterly extension of Hicks dome is partly obscured by a fault zone 4–5 miles (6.5–8 km) wide known as the Rock Creek graben (fig. 23). Southeast of the graben, the structural high reappears as the Tolu dome or arch,

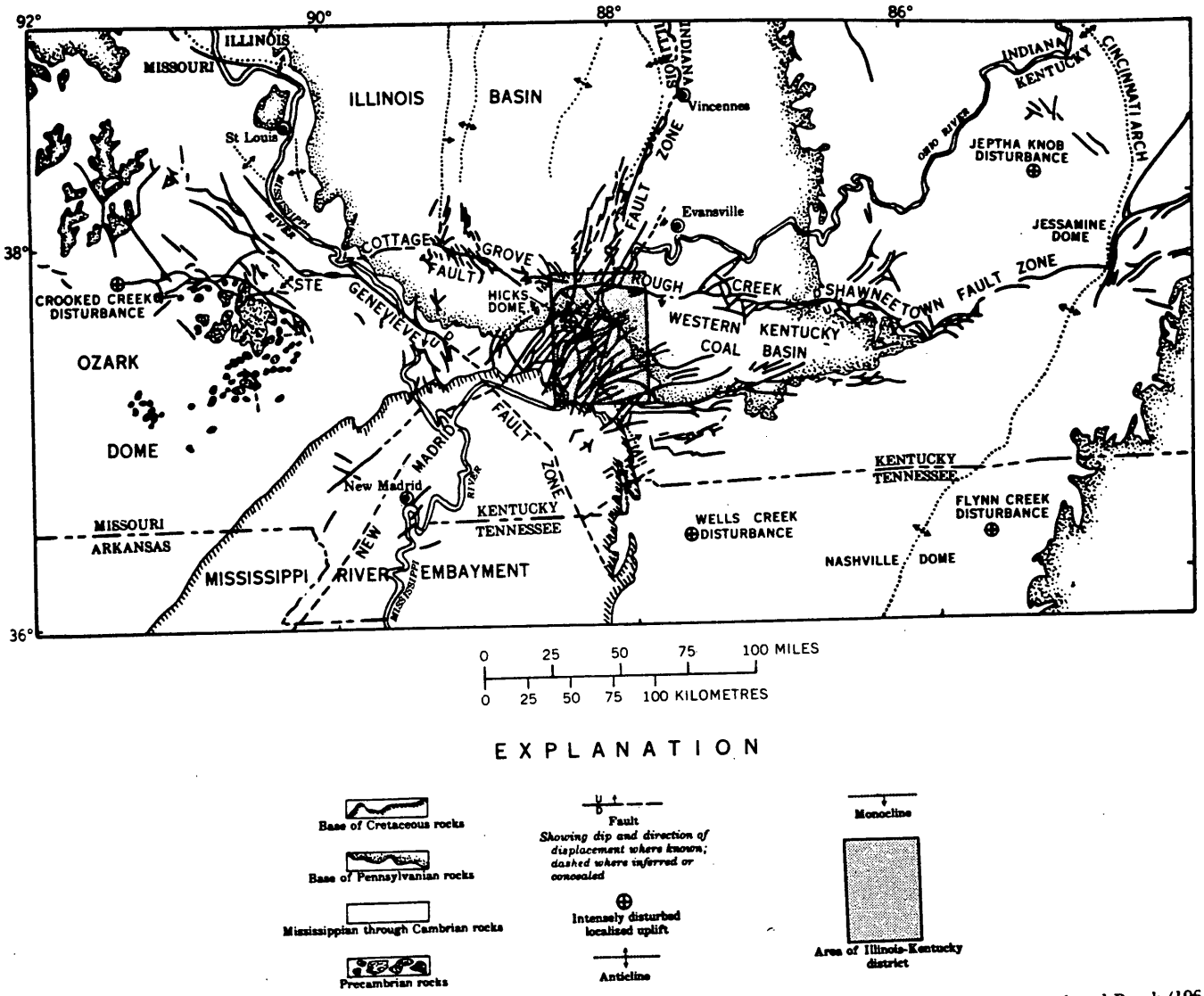


FIGURE 26.—Major structural features in the region surrounding the Illinois-Kentucky fluorspar district. Modified from Heyl and Brock (1961, fig. 294.1).

which is centered about a mile east of Tolu, Ky., in the Cave in Rock quadrangle (Baxter and others, 1963).

Southeast of the Tolu dome is another series of grabens (Weller and Sutton, 1951) bounded on the south by the Tabb fault system (Rogers and Hays, 1967); in this area a structural high is difficult to trace because of numerous faults. Possibly an extension of the high is shown on the Salem quadrangle (Trace, 1962a) between the Levias-Crittenden Springs fault system and the Moore Hill fault system. Farther south in the Dycusburg quadrangle, preliminary mapping suggests three more possible segments of the arch (Dewey Amos, oral commun., 1971) (see fig. 23).

Nearly all the faults of the district are normal and dip generally 75° to vertical; rarely are they inclined as low as 45°. Locally the dip of a fault or vein is reversed. Along the edges of many of the larger grabens, fault zones consist of several subparallel and sinuously intersecting faults. The total width of these zones may be more than 1,000 feet (300 m); more commonly it is a few hundred feet. Total displacement across the fault zone is commonly distributed irregularly among the several individual faults—in places as step faults and also small grabens within the fault zone, such that all faults either are vertical or dip toward the hanging wall of the fault zone. In some places, small grabens are formed by antithetic faults that dip toward the footwall side of the fault zone (fig. 27). Minor antithetic faults and fractures are present in places for a few hundred feet from the margins of the major graben.

Vertical displacement generally has been considered to have been the principal direction of movement along the major northeast-trending faults in the district. Clark and Royds (1948) and Heyl and Brock (1961), however, suggested that a horizontal component of movement may have been significant. Field mapping has shown that as much as 3,000 feet (900 m) of vertical displacement may have taken place, but movement generally has been much

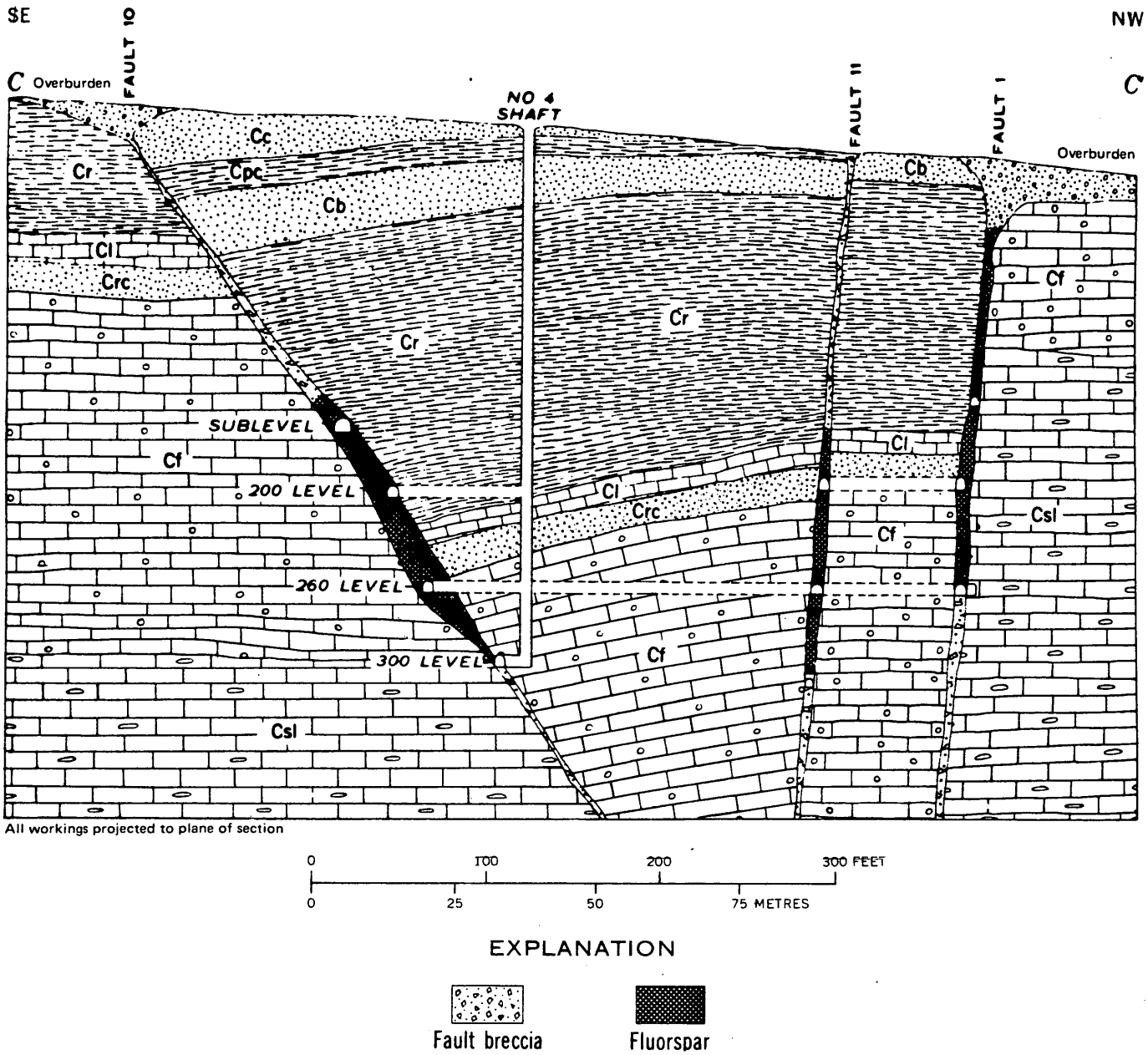


FIGURE 27.—Cross section of Davenport mine, Moore Hill area, Kentucky. Cc, Cypress Sandstone; Cpc, Paint Creek Formation; Cb, Bethel Sandstone; Cr, Renault Limestone; Cl, Levias Limestone Member of Ste. Genevieve Limestone; Crc, Rosiclare Sandstone Member of Ste. Genevieve Limestone; Cf, Fredonia Limestone Member of Ste. Genevieve Limestone; Csl, St. Louis Limestone. Modified from Thurston and Hardin (1954, pl. 14).

less. Evidence of strike-slip movement on the faults is conflicting; there is no evident horizontal offset of the northwest-trending mafic dike swarm where these elements are cut by northeast-trending faults, but there is some possible horizontal offset of the northwest-trending structural high (fig. 23) along these faults. Data from a few drill holes in the Crittenden Springs and Commodore areas (Salem quadrangle) suggest that the amount of vertical displacement on faults at depths of nearly 2,000 feet (600 m) below the surface is substantially the same as at the surface.

At least some and probably most of the major northeast-trending faults are younger than Hicks dome and the mafic dikes, and therefore are post-Early Permian in age. The major displacement along these faults may have been completed by middle Cretaceous, although some movement has continued through Cretaceous and Tertiary time and up to the present (Rhoades and Mistler, 1941; Ross, 1963; McGinnis, 1963; Amos, 1967). Some faulting may have begun as early as Early Pennsylvanian time.

FLUORSPAR ORE DEPOSITS

Most of the fluorspar ore deposits are along northeast-trending faults; a few veins are found along the northwest-

and north-trending faults and in places are associated with mafic dikes (Trace, 1962b). The distribution of known deposits is shown on figure 23. D. R. Shawe observed (written commun., 1972) that the ore deposits tend to be concentrated in areas of mafic dikes and breccia pipes, as is suggested from figure 23; Trace is doubtful of the spatial association, however.

Fluorspar ore bodies occur dominantly either as steeply dipping to vertical vein deposits along faults or as low-dipping to nearly flat bedding-replacement deposits along certain stratigraphic horizons in Mississippian limestones (fig. 24; Currier and Wagner, 1944). A few deposits are a combination of vein and bedding-replacement type ores and so-called gravel deposits that resulted from a fluorite concentration in the residuum overlying vein deposits. Protore amounts of disseminated fluorite are present in the breccias of Hicks dome (Brown and others, 1954).

The fluorspar veins commonly are fissure fillings along faults and in fault breccias, accompanied by replacement of vein calcite and some wallrock. A typical vein is lenticular, pinching and swelling erratically, and is commonly a mixture of fluorite and highly variable quantities of calcite and country rock fragments. Locally the entire vein may be either calcite or fluorite. Commonly the vein walls are sharp but in places veinlets of fluorite and calcite extend into the slightly broken wallrocks for a few hundred feet.

The fluorite varies from commonly purple, fine- and medium-grained crystalline in small veinlets to commonly brown, white, or colorless, coarsely crystalline in more massive veins. In many places, the veins are complexly brecciated and (or) sheeted. Rude layering ("banding") parallel to vein walls is present locally. Shaly fault gouge, presumably dragged in along the fault from the more shaly of the Chesterian units, is common in places.

Most fissure-vein deposits average 3–10 feet (1–3 m) in width (Hardin and Trace, 1959; Trace, 1962b); a width of as much as 45 feet (14 m) is known. Mined ore shoots commonly range in strike length from 200 to 400 feet (60–120 m) though greater lengths are common in many places, particularly in the Rosiclare area. The average height of the ore shoots is 100–200 feet (30–60 m) but some ore shoots extend from the surface to a depth of nearly 800 feet (250 m) (Grogan and Bradbury, 1968, fig. 10).

The stratiform or bedding-replacement deposits are elongate bodies that trend northeast and less commonly southeast (fig. 28), and "are localized along a network of fractures and minor faults parallel to and half a mile distant from the Peters Creek fault * * * " (Grogan and Bradbury, 1967, p. 41–42). In cross section, they appear as flat wedge-shaped or crescentic (concave upward) forms with thicker parts adjacent to individual faults: A few nearby pipelike breccia zones are mineralized and may have been

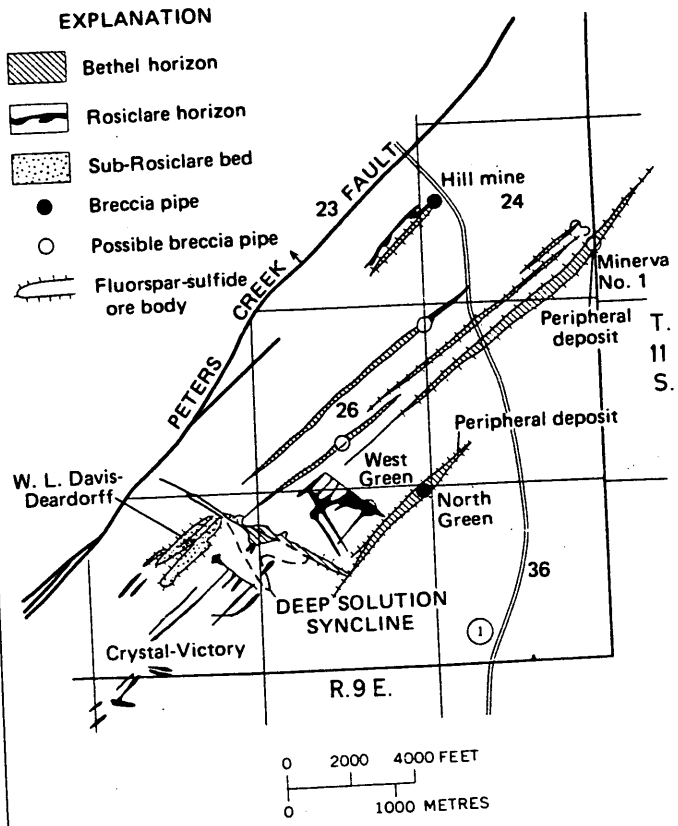


FIGURE 28.—Cave in Rock fluorspar district, Hardin County, Ill., showing elongate character of northeast-trending ore bodies. Modified from Brecke (1967, fig. 2. p. 381).

conduits for ore solutions (Brecke, 1962, p. 511–514; Grogan and Bradbury, 1968, p. 393–394).

The bedding-replacement ore bodies in Illinois are commonly 50–200 feet (15–60 m) wide, and 5–20 feet (1.5–6 m) thick; their length is highly variable, from 200 feet (60 m) to 2 miles (3 km). The grade of the ore also is highly variable, but the general grade of mine-run ore ranges from 20 to 35 percent of CaF_2.

The bedding-replacement deposit being mined in Kentucky is believed to be approximately 2 miles (3 km) long, 150–250 feet (45–75 m) wide, and averages 7 feet (2.1 m) in thickness, containing about 30 percent of CaF_2, and small quantities of zinc and barite (John S. Tibbs, oral commun., 1971).

Texture of the bedding-replacement deposits was described by Brecke (1962, p. 515–525) as "banded," imperfectly "banded," and brecciated. The latter two types characterize the majority of the deposits.

The deepest minable fluorspar in the Illinois-Kentucky district is in a vein in the Rosiclare area and at a depth of about 800 feet (235 m) (Grogan and Bradbury, 1968, p. 380). In the Kentucky part of the district the deepest mine working on a vein is about 700 feet (210 m). A substantial number of holes has been drilled in the Rosiclare area (Muir, 1947) to intersect the veins more than 1,300 feet (400 m) below the surface, but at that depth they are

dominantly calcite and wallrock breccia. In Kentucky a few holes have been drilled to almost 2,000 feet (600 m) below the surface, with virtually the same results.

The average grade of ore mined from the deposits has varied. Twenty to thirty years ago, the ore mined commonly contained at least 45 percent of CaF_2, but gradually the ore cutoff grade has dropped, probably to somewhere between 25 and 40 percent of CaF_2 in 1972. Various factors have influenced the ore grade in addition to the selling price of the finished product, such as the amount of byproduct zinc and lead, and the varying costs of mining that depend primarily on the type of deposit and also on mine depth, amount of water, and degree of stability of mine walls or roof.

The most abundant minerals in the vein deposits are calcite and fluorite. Concentrations of sphalerite or barite are present in places, although more commonly sphalerite, barite, and galena occur in small quantities with the fluorite. Minor quantities of quartz, pyrite, marcasite, and chalcopyrite are present and locally zinc, lead, or copper alteration products (cerussite, pyromorphite, smithsonite, hemimorphite, greenockite, cuprite and malachite). Celestite has been reported in one locality in Kentucky (Hardin and Thurston, 1945).

The bedding-replacement deposits contain virtually the same suite of minerals. The principal difference is the quantity of calcite—abundant in the vein deposits, and common, though not abundant, in the bedding-replacement deposits. Fluorite is the principal mineral in the bedding-replacement deposits. Locally sphalerite, galena, and barite are abundant but generally they are uncommon. Calcite and quartz are widespread but sparse. Chalcopyrite, marcasite, pyrite, witherite, strontianite, smithsonite, cerussite, malachite, and pyromorphite have been reported.

Paragenesis of the vein and of the bedding-replacement deposits appears to be similar. Of the more abundant minerals, calcite is the earliest, overlapped and followed by fluorite. Sphalerite and galena generally appear to overlap and follow fluorite, and barite is the youngest common mineral. Hall and Friedman (1963, p. 891) reported on the paragenesis of the Cave in Rock deposits, and Pinckney and Rye (1972) reported on oxygen and carbon isotope variations in minerals deposited at different times in the wallrocks.

Fluid-inclusion studies of the temperature of deposition of the fluorspar have been done by Freas (1961) and Grogan and Shrode (1952). Their studies indicate a range in temperature from 90° to 140°C.

The composition of fluid inclusions in the ore and gangue minerals of the Cave in Rock area was studied by Hall and Friedman (1963). According to them, the general composition of the fluid inclusions suggests that the fluorite was deposited from a concentrated Na-Ca-Cl brine, probably of connate origin. Fluid inclusions in the quartz, however, have lower salt content, have a high ratio of K/Na, Ca/Na, Cl/Na, and SO_4/Na, and a lower relative deuterium concentration than that found in the fluorite itself. These fluids may represent a magmatic water.

No apparent districtwide zoning of fluorite, sphalerite, and galena has been reported. Brecke (1964a) suggested that barite is more common on the fringes of the district, but exceptions in the Lola, Ky., area tend to obscure a broad picture of this zoning. Heyl (1969) suggested a zonation pattern for silver and antimony in galena, around Hicks Dome (see also Heyl and others, 1966), and a systematic change in the lead isotopic ratios from Hicks dome southeast into Kentucky.

Close dating of the age of mineral deposition has been difficult. Heyl and Brock (1961, p. D6) reported an age of 90–100 m.y. (middle Cretaceous) for monazite in fluorite-bearing breccia found at Hicks Dome, but this age is in doubt because of the weathered character of the monazite (Heyl, written commun., 1972). No other direct evidence exists for the age of the deposits.

Minor elements in the ore deposits have been reported by Hall and Heyl (1968). According to them, the fluorite is remarkably pure, except for the fluorite in breccias at Hicks dome which contains abundant rare earths. The sphalerite of the district is relatively high in cadmium, germanium, and gallium, but low in silver. The galena contains varying quantities of silver.

SUMMARY

The geologic history and genesis of the Illinois-Kentucky fluorspar district have been discussed by Amstutz and Park (1967), Brecke (1962, 1964b, 1967), Brown (1970), Grogan and Bradbury (1968), Hall and Friedman (1963), Hall and Heyl (1968), Heyl, Brock, Jolly, and Wells (1965), Heyl (1969), Oesterling (1952), Park and Amstutz (1968), and Snyder and Gerdemann (1965). The origin and chronological age of many of the significant geologic features of the district are still not established. Many structural and mineralogical events must have both overlapped and recurred, and therefore many a geologist has been confused and frustrated in attempting to establish the correct geologic history. In general, however, the history can be divided into three broad phases, all of which occurred principally within the interval of post-Middle Pennsylvanian to Cretaceous. The oldest events were the structural arching and formation of Hicks and Tolu domes, the intrusion of dikes and sills, and the formation of breccias. From the data of Zartman, Brock, Heyl, and Thomas (1967) these features appear to be early Permian in age. Next came most of the movement along the northeast-trending faults, followed by the third major phase, that of mineral deposition.

The general location of the Illinois-Kentucky district may be structurally controlled by the intersection of the northeast-trending faults of the New Madrid system with mafic dikes, and the structural high trending northwesterly through the district, and possibly with an east-

file w/ contract

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 939
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

May 4, 1984

Re: OME 6873 (fluorspar, etc.)
Kerlin, Goelet and Goelet d/b/a/
Hicks Dome Account
Hardin County, Illinois
Contract 2306

Mr. John Lee Carroll
Silver Resources Corporation
515 Madison Ave. 32nd floor
New York, New York 10022

Dear Mr. Carroll:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely,

J. William Hasler

J. William Hasler, Chief
Office of Minerals Exploration

Form MME 63
(May 1970)

REQUEST FOR INFORMATION ON CERTIFIED PROJECT OR PROJECT UNDER ROYALTY AGREEMENT

1. Since May 16, 1983, has there been a change in ownership, lease, or sublease? *If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before.* Yes ☐ No ☒

2. Since May 16, 1983, has there been any production from the land subject to the contract? Yes ☐ No ☒

A. If so and it was shipped, give quantity, value, and name and address of purchaser.

Purchaser (*name and address*)	Quantity	Value

B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity (*tons*)	Estimated Grade	Location
Ore			
Concentrates			
Other			

3. Since May 16, 1983, has any production been transported through workings (*see of contract*)? Yes ☐ No ☐

If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name John L. Carroll	*Title* Agent
Address 515 Madison Avenue New York, N.Y. 10022	*Date* 5/8/84

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

21 APR 1976

Messrs. Gilbert Kerlin, Robert G. Goelet,
Francis Goelet d/b/a Hicks Dome Account
c/o Mr. John L. Carroll
Room 4120, 345 Park Avenue
New York, New York 10022

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Pursuant to Article 7 of the referenced contract, as amended, the Government hereby certifies that mineral or metal production may be possible as a result of the exploration work.

Therefore, royalties shall be paid to the Government as provided in the contract on all production from the land described in the contract from September 26, 1972, to September 26, 1989, or until the total amount contributed by the Government under the contract ($118,206.55, plus accrued interest) is fully repaid, whichever occurs first. Under provisions of Article 1(c) of the Contract, as amended, and Paragraph 2 of Amendment No. 4, thereto, simple interest accrues on the amount contributed by the Government at the annual rate of:

8-1/4 percent on the first $47,725.00,
9 percent on the amount between $47,725.00 and $67,493.00,
8-3/4 percent on the amount between $67,493.00 and $113,558.00, and
9-3/4 percent on the balance to $118,206.55.

The payment of royalties is secured by Performance Bonds executed by the Aetna Insurance Company under dates of September 29, 1972, June 22, 1973, January 28, 1974, and July 5, 1974.

Royalty payments on any production computed as provided in the contract should be made in favor of the U.S. Geological Survey and mailed or delivered to the Chief, Office of Minerals Exploration, U.S. Geological Survey, National Center, 12201 Sunrise Valley Drive, Reston, Virginia 22092. Each payment should be accompanied by two copies of settlement sheets or other

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

suitable sales evidence showing the date of sale, name of the purchaser, the quantity and grade of the production sold, the price per unit, and the gross proceeds and allowable deductions therefrom. The purchaser should be notified of the Government's royalty on production and directed to pay the royalty, computed as provided in the contract, directly to the Government.

The Office of Minerals Exploration should be promptly notified upon the commencement of any production and upon any extended cessation thereof. Production unsold or unused six months after extraction from the ground should be reported promptly to the Office of Minerals Exploration.

Attention is specifically invited to the provisions of Article 2(c) of the Contract referring to the preservation of the Government's royalty rights. Two true copies of any instrument transferring, surrendering or encumbering any of said rights shall be furnished to the Office of Minerals Exploration.

Dated this 21st day of April, 1976.

THE UNITED STATES OF AMERICA

Harold Kirkemo

Chief, Office of Minerals Exploration
U.S. Geological Survey

Martin 4/20/71

cc:
DRF
MR Rdg.
OME Rdg.
OME Files
Mr. Kirkemo
Trace, Laurence
Heyl,

Mr. Porter

FINAL REPORT--OME EXPLORATION PROJECT

OME-6873 (Fluorspar-beryllium-rare earths-thorium-niobium)
Gilbert Kerlin, Robert G. Goelet, Francis Goelet, d/b/a
Hicks Dome Account, a partnership
Hicks Dome Property
Hardin County, Illinois
Contract 2306 (Long Form)

by
Harold Kirkemo, Chief
Office of Minerals Exploration
November, 1978

Preface

This report summarizes the program of work, costs, and results of the Hicks Dome OME project. The report is based on detailed and voluminous reports, monthly and final, by Joseph A. Porter, the Operator's project representative, memoranda by Robert D. Trace, Allen V. Heyl and other USGS geologists who frequently visited the project while drilling was in progress and who (Heyl in particular) carefully studied the drill core, and on the final audit and cost review of the project.

1. Operator: Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
53 Wall Street
New York, New York 10005

John Lee Carroll, geologist and agent for Operator
345 Park Avenue
New York, New York 10022
Phone: (212) 688-3353

Joseph A. Porter, geologist and project representative
for Hicks Dome Account
P.O. Box 3
Herod, Illinois 62947
Phone: (618) 264-2873

Mr. Porter stated in a letter dated September 11, 1972, that Hicks Dome Account is a General Partnership and all expenditures were to be made solely for the Account and not for the account of any other person, corporation, or entity in the mining industry or otherwise.

Property: The land included in the Contract consisted of eight (8) contiguous tracts of leased land or mineral rights thereto totalling approximately 615 acres in section 25, T. 11 S., R. 7 E., and sections 30 and 31, T. 11 S., R. 8 E., Third Principal Meridian, Hardin County, Illinois. Information on the leases follows:

Date of lease or deed	Acres	Parties to lease or deed	Description
March 20, 1970	160	First State Bank of Elizabethtown, Illinois, lessor, Industrial Minerals Exploration Co., lessee.	E-1/2 NE-1/4 sec. 25, T. 11 S., R. 7 E., and W-1/2 NE-1/4, Sec. 30, T. 11 S., R. 8 E.
March 13, 1971	79.543	Mabel A. Pankey, grantor Industrial Minerals Exploration Co., grantee. (17/21st interest in tract)	NE-1/4 NW-1/4 and SE-1/4, NW-1/4, Sec. 30, T. 11 S., R. 8 E, less a parcel, containing approximately 0.457 acre excepted in lease.
July 30, 1971	Same as above	Etta Irby and Iley "Doc" Pankey, lessors, Antaeus Resources Corp., lessee. (4/21st interest in tract)	Same as above
March 12, 1970	40	Florence F. Loyd, Fluorine Loyd, S. D. Loyd, Beulah Loyd, Marybelle L. McLin, W. R. McLin, lessors, Industrial Minerals Exploration Co., lessee.	SW-1/4 NE-1/4 sec. 30, T. 11 S., R. 8 E., less a parcel containing approximately 0.45 acre excepted in lease.
Feb. 18, 1972	61.5	William L. Hamp, Applena Hamp, James E. Hamp, Diane K. Hamp, Franklin E. Hamp, and Mary H. Hamp, lessors, Antaeus Resources Corp., lessee.	N-1/2 NW-1/4 SW-1/4 Sec. 30, and portion of E-1/2 SW-1/4 sec. 30, T. 11 S., R. 8 E.
April 14, 1970	40	Lola Ewell Fredericks, Jack L. Fredericks, and Sophia Coy, lessors, Industrial Minerals Exploration Co., lessee	N-1/2 SW-1/4 SW1/4 and S-NW-1/4 SW-1/4 sec. 30, T. 11 S., R. 8 E.
March 9, 1970	20	Emma D. Jenkins, Eulala Wunderlich and Fred Wunderlich, lessors, Industrial Minerals Exploration Co., lessee.	Portion of E-1/2 SW-1/4 sec. 30, T. 11 S., R. 8 E.
May 14, 1971	90	Edwin E. Rose, Gladys Rose, Thomas Rose, Vivian Rose, Veloise Zeller, William Zeller, Maude E. Williams, and Virgil H. Williams, lessors, Antaeus Resources Corp., lessee.	N-1/2 SE-1/4, sec. 30, and E-1/4 NE-1/4 SW-1/4 sec. 30, T. 11 S., R. 8
Feb. 22, 1972	105	J. J. Coan Co., Inc. International Fastener Research Corp., J.D. Quarant, Allene B. Quarant, lessors, Antaeus Resources Corp., lessee.	S-1/2 SE-1/4 sec. 30, T. 11 S., R. 8 E. except north 15 acres of SE-1/4 SE-1/4; and the NW-1/4 NE-1/4 sec. 31, T. 11. S R. 8 E.

These tracts are shown on Figure 1, revision 2, which was adapted from the figure in Amendment No. 2 to the Contract.

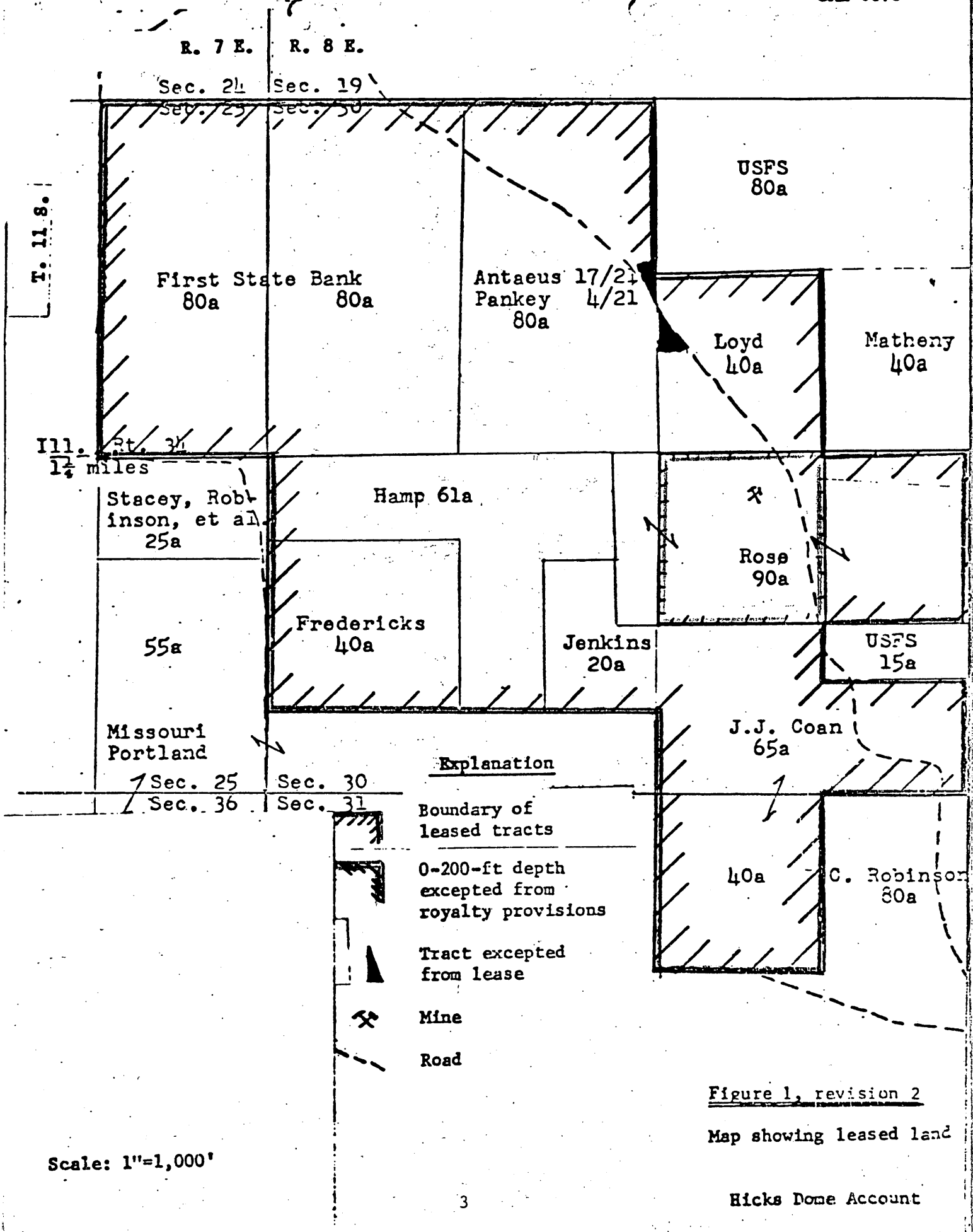


Figure 1, revision 2

Map showing leased land

Scale: 1"=1,000'

Hicks Dome Account

Hardin County, Illinois

Ownership: The Operator is in possession of this land or mineral rights under terms of an Agreement dated May 10, 1971, between Hicks Dome Account and Antaeus Resources Corporation, which granted to Hicks Dome Account all of the leases held by Antaeus Resources. The lease with J. J. Coan Company was entered into after the Agreement was executed. The requirement for payment of royalty to the Government on mineral production does not apply to production obtained from mining above the 200-foot level in the NW¼ SE¼, section 30, T. 11 S., R. 8 E. of the Rose-Zeller-Williams tract.

2. Purpose of Project: The purpose of the project was to explore by diamond core drilling for fluorspar-beryllium-rare earths-thorium-niobium ores in mineralized breccias in the Hicks Dome cryptovolcanic structure.

3. Contract: Dated September 26, 1972, for a term of eight (8) months, or to June 10, 1973. Extended by amendments to June 26, 1975. Original contract amount $95,450 (Gov't share at 50 percent, $47,725).

If a certification of possible production is issued on this Contract, the period of royalty obligation would be fifteen (15) years. In lieu of a Consent to Lien and Subordination Agreements, the Operator posted a performance bond for $47,725 (Aetna Insurance Co.).

Amendments:

No. 1: June 29, 1973, extended time for completion of work from 8 to 15 months, or to December 26, 1973, increased the total allowable cost of the work to $151,930.00 (Government share at 50 percent on the first $47,725, and 35 percent on an additional $19,768.00 for a total of $67,493.00), revised Article 1(c) of the Contract concerning interest computation to:

8¼ percent on Government's contribution to $47,725.00 and

9 percent on Government's contribution over $47,725.00 but not in excess of $67,493.00.

It also required the Operator to post another performance bond to cover the penal sum of $19,768.00 for Stage II.

Exhibit A of the Contract was revised by adding rotary drilling to the statement on purpose of the project, establishing a 2-stage work program, and changing the Actual Costs section in Exhibit A of the Contract.

No. 2: January 31, 1974, extended time for completion of work from fifteen (15) months to twenty-one (21) months from date of the Contract, or to June 26, 1974, increased the the total allowable cost of the work to $266,110.00 (Government share at 50 percent for Stages 1 and III, and 35 percent for Stage II for a total sum of $113,558.00), revised interest computation to:

8-1/4 percent on Government's contribution to $47,725.00,

9 percent on Government's contribution over $47,725.00 but not in excess of $67,493.00, and

8-3/4 percent on Government's contribution over $67,493.00 but not in excess of $113,558.00.

The Operator was required to post an additional bond to cover Government's share of the added cost of the work, and the work plan was revised to three stages.

No. 3: June 26, 1974, extended time for completion of work from twenty-one (21) to twenty-seven (27) months from date of Contract, or to December 26, 1974, extended period of obligation for payment of royalty from fifteen (15) to seventeen (17) years from the date of Contract, or until September 26, 1989 (incorrectly stated originally in the Amendment), substituted 17 years for 15 years in paragraph on page 3 of Annex I to the Contract which pertains to extending obligation for royalty payments to lands acquired within 1,000 feet of the boundaries of the land described in the Contract, and allowing deletion of lands and reacquisition.

No. 4: June 28, 1974, increased the total allowable cost of the work to $276,110.00 (Government's share at 50 percent in Stages I, III, and IV, and 35 percent in Stage II for a total sum of $118,558.00), revised interest computation to:

8-1/4 percent on Government's contribution to $47,725.00,

9 percent on Government's contribution over $47,725.00 but not in excess of $67,493.00,

8-3/4 percent on Government's contribution over $67,493.00 but not in excess of $113,558.00, and

9-3/4 percent on Government's contribution over $113,558.00, but not in excess of $118,558.00.

Required the Operator to post performance bonds adequate to cover $118,558.00.

The work plan was revised to four stages with Stage IV allowing analytical work and related services on samples obtained from drilling.

No. 5: December 20, 1974, extended time for completion of work from twenty-seven (27) to thirty-three (33) months from date of Contract, or to June 26, 1975.

4. Project Work: Drilling started October 5, 1972, was completed May 10, 1974, and analytical work was completed in March 1975. The Operator's report on Stage IV (analytical work) was dated June 25, 1975, and the Operator's Final Report was dated November 26, 1975.

The project was conducted in four stages. Stages I, II, and III involved drilling, assaying, services, and items necessary to complete work set forth in the Contract. Stage IV consisted of additional analytical work and interpretation.

Work completed on the Contract consisted of 12 drill holes totalling 29,339 feet of which 3,670 feet were rotary drilled and 25,669 feet were diamond drilled.

A total of 2,043 analyses were made of drill core and cuttings for specific elements of which 610 were for CaF_2. In addition, 143 spectrographic analyses and 229 x-ray fluorescence determinations were made.

The Operator submitted 19 vouchers showing costs of $259,137 of which OME accepted $255,516 and reimbursed the Operator $118,207 for Government participation. The units of work authorized and approved under the Contract were summarized as follows in the final audit dated April 1, 1976:

Allowable Costs	Costs claimed and approved by Audit
Stage I	
Category:	
(1) Independent Contracts	$60,436
(2) Personal Services	9,314
(3) Operating Materials and Supplies	1,491
(7) Miscellaneous	2,144
Stage II	
Category:	
(1) Independent Contracts	53,679
(2) Personal Services	6,802
(3) Operating Materials and Supplies	797
(7) Miscellaneous	2,399
Stage III	
Category:	
(1) Independent Contracts	98,007
(2) Personal Services	14,280
(3) Operating Materials and Supplies	1,553
(7) Miscellaneous	3,961
Stage IV	
Category:	
(7) Miscellaneous	4,274
Total Allowable Cost	259,137 a/
Government Participation	118,207

a/ Includes $3,621 of excess allowable type costs not accepted by OME.

A summary of drilling completed, shown as Table 1 in the Operator's Final Report, was the basis for the following compilation:

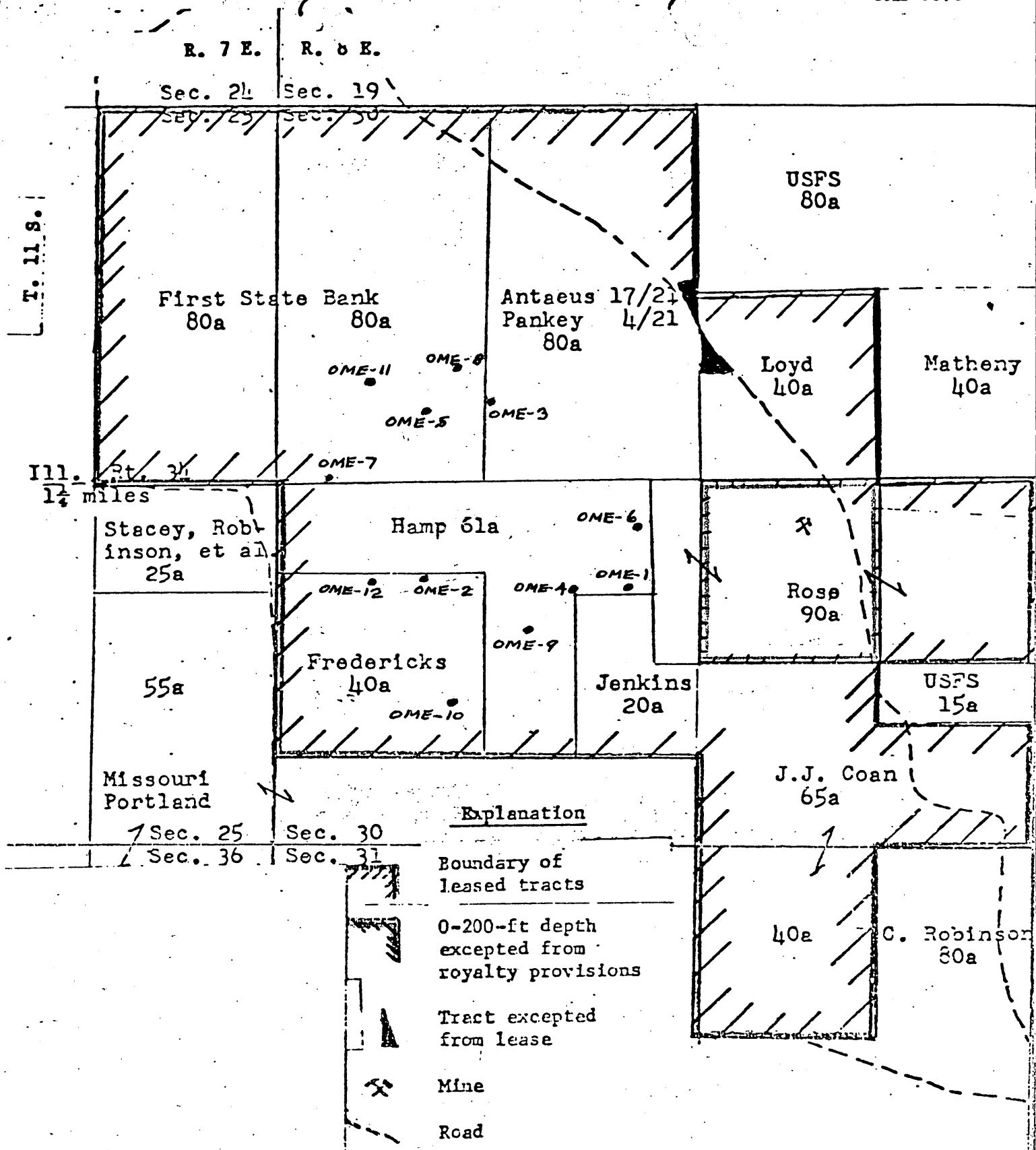
Summary of drilling

Hole no.	Land tract	Started	Finished	Feet Drilled Rotary	Feet Drilled Cored	Total depth, feet
OME-1	Hamp	10/5/72	12/2/72	141	2,185	2,326
OME-2	Fredericks	12/5/72	1/20/73	120	2,080	2,200
OME-3	Pankey	12/11/72	3/26/73	361	2,016	2,377
OME-4	Hamp	2/5/73	5/25/73	166	2,034	2,200
OME-5	FSB[1/]	5/16/73	8/2/73	325	2,080	2,405
OME-6	Hamp	8/6/73	9/8/73	719	1,685	2,404
OME-7	FSB	9/10/73	10/6/73	785	1,760	2,545
OME-8	FSB[2/]	10/25/73	2/1/74	105	2,892	2,997
OME-9	Hamp	10/25/73	1/16/74	676	1,717	2,393
OME-10	Fredericks	11/28/74	3/15/74	128	2,339	2,467
OME-11	FSB	2/2/74	4/6/74	64	2,452	2,516
OME-12	Fredericks	3/18/74	5/10/74	80	2,429	2,509
			Totals	3,670	25,669	29,339

1/ FSB - First State Bank

2/ Represents second attempt to drill this hole. First attempt totaled 720 feet of rotary. Hole was abandoned and is not included in the totals.

Locations of these holes are shown on Figure 1, revision 3, which follows.



Scale: 1"=1,000'

Figure 1, revision 3

Map showing leased land and OME Drill Holes

Hicks Dome Account

Hardin County, Illinois

The Government retained no equity in any of the materials or equipment used.

Effectiveness of the Work: The target area was explored satisfactorily considering the amount of Federal funds available. Adequate funding would have enabled the Operator to drill more holes to better determine the extent and grade of mineralized material within the property.

Efficiency of Operation: The extended duration of the project from the original 8 months to 33 months was due to:

1. Inability of the first drilling contractor to continue with the project.

2. Need to recast Estimated Costs and to prepare amendments to the Contract allowing more realistic prices for goods and services.

3. Long period of time required to obtain results from a commercial analytical laboratory.

5. Reports:

Operator's Final Report: A final report, dated June 20, 1975, on all assay data resulting from analytical work completed under Stage IV of the Contract was submitted by Joseph A. Porter. An acceptable Final Report, also by Mr. Porter, dated November 26, 1975, was received December 5, 1975.

Cost Review: A Memorandum Audit Report and Cost Review of the Contract was issued April 1, 1976, by the Office of Audit and Investigation, Eastern Region.

Royalty Review: There was no production from the project area during the OME project, and none to date (November 1978), therefore, a Royalty Review has not been requested.

6. Project Results:

Discoveries: In a memorandum dated May 17, 1974, Allen V. Heyl, geologist, USGS, reported as follows in support of the Operator's request for increased funding for additional funding (subsequently provided in Amendment No. 4 to the Contract):

" Examination of the analysis results completed to date show a very large mineral body, which is not only enriched in fluorspar, beryllium, niobium, yttrium, and barite, but also in thorium and the specific yttrium family, heavy rare earth elements such as ytterbium, gadolinium, dysprosium, holmium, erbium, and thulium. Thorium is becoming of increased importance in new-phase nuclear reactors, and this body at Hicks Dome may be the largest single thorium resource in the country of great future value. The yttrium family heavy rare earth elements are very recently of great value for color television screens, electronic uses, petroleum-cracking catalysts, and high intensity lighting. Again, the Hicks Dome body may be a major potential source of these elements.

"The analyses completed to date show that parts of the mineral body lean in fluorspar may be enriched in the other elements, Be, Nb, rare earths, Ti, Th, and yttrium. Much of this lower grade ore needs analyses for these elements, which together make up the potentially most valuable parts of the deposit. For example, the better fluorspar (i.e., 50 - 20%) if recovered, has a potential value of $15 to $25 per ton, but the average niobium content of 0.2% Nb has a potential value of about $25 per ton and the average total heavy rare earth (from sparse analyses) of one to two per cent would have a potential value of $40 to $80 per ton in the ore in the ground. Hence, the average value of rock in the ground would probably be increased from perhaps $20 per ton to about $100, or to $150 per ton if the values of all the major elements are known and successful recovery methods developed."

The Operator estimated resources indicated by the OME drilling (page 4 of Final Report) to be as follows:

Total mineralized material 11,324,000 tons (rounded)

Average Grade

11.45% CaF_2	0.209% Thorium
3.64% $BaSO_4$	0.177% Yttrium
0.155% Niobium	

The resources were calculated to be in seven blocks of which four were based on or influenced by more than one drill hole, and three were based on one hole each, as shown in the following tabulation:

SUMMARY OF TONNAGE AND AVERAGE GRADE

Resource block	Tons	CaF_2	$BaSO_4$	Nb	Th	Y
		(Percent)				
		Based on or influenced by more than one hole				
Hamp A	4,462,500	9.90	N.A.	.159	.239	.193
Hamp B	2,649,375	9.36	3.26	.159	.239	.193
FSB-A	1,880,000	15.30	5.36	.119	.147	.157
FSB-B	662,000	22.22	2.89	.250	.180	.176
		Based on one hole				
FSB-C	870,000	10.67	2.00	.149	.144	.114
FSB-D	295,000	9.27	2.78	.117	.104	.045
Fred-A	523,333	10.33	3.57	.133	.232	.214
Total	11,342,208	11.45	3.64 1/	.155	.209	.177

1/ Block Hamp-A is not included in weighted average.

Depths to the top and bottom of drill hole intersections with the mineralized material included in the Operator's resource estimates, and the average thickness of the mineralized zone in each resource block were as follows:

Resource block	Intersection, range in feet from surface	Average thickness, feet
Hamp-A	1906-2262	238
Hamp-B	1906-2224	157
FSB-A	2055-2243	188
FSB-B	2300-2366	66
FSB-C	2233-2494	261
FSB-D	2154-2243	89
Fred-A	1908-2065	157

Since the project work was completed, the Operator has been arranging more permanent rights to the land tracts than the leaseholds which had been signed with the property owners prior to the OME contract. This is a long, protracted, procedure because of the many landowners, heirs, and claimants involved. Upon completing these negotiations, presumably the next goal of the Operator will be to further evaluate the Hicks Dome deposit, and eventually to undertake production.

Certification: A Certification of Possible Production was issued on April 21, 1976. The Government's lien for payment of royalties expires on September 26, 1989, or earlier if the total amount ($118,206.55) contributed by the Government and accrued interest are repaid in full. Interest is charged at varying rates as set forth in Amendment No. 4 to the Contract.

Royalties: No ore or concentrate was sold during the period of the exploration work and no royalties were paid or due the Government.

7. Environmental Considerations: Work done under the Contract was not a major Federal action significantly affecting the quality of the environment. Therefore, an environmental impact statement as specified under section 102 of the National Environmental Policy Act as amended and Executive Order No. 11514, 35 F.R. 4247 (1970) was not required.

8. Geologic Summary: Hicks Dome is located on the south rim of the Illinois basin in complexly faulted, broadly folded Paleozoic strata underlying the Illinois-Kentucky fluorspar district. The project area is located in the central portion of the dome, and is about 6,000 feet long in a northwest direction and 3,500 feet wide. Sedimentary rocks in the area, either exposed or cut in deep drill holes, consist of dolomites, sandstone, chert, and shale of Ordovician, Silurian, or Devonian age. Total thickness of these strata is several thousand feet.

The only igneous rocks in the area are a few mica peridotite dikes which have been cut in some of the drill holes.

The economically important lithologic structures in the dome are explosion or cryptovolcanic breccias which penetrate into the sedimentary rocks. An inverted funnel configuration is suggested for these bodies. The main breccia mass which was the exploration target for this project consists of intensely brecciated fragments of the enclosing rocks to a depth of about 2,500 feet and coarser, larger and less well mixed fragments below that depth. The better grade and more persistent mineralization occurs as finely disseminated minerals replacing rock flour matrix and breccia fragments. The more common location for the consistently mineralized material is in the breccias occupying the stratigraphic position of the lower part of the Decorah-Plattin limestone in the Ordovician strata. The coarser matrix referred to by Porter as "monomineral" is not as well mineralized.

Heyl concludes that drilling on the OME project showed a very large mineral body. Its future development will require extensive, additional exploration drilling followed by shaft sinking, crosscutting, and drifting to determine the lateral extent, thickness, and grade of the mineralized material.

30. SIGNIFICANCE OF UNUSUAL MINERAL OCCURRENCE AT HICKS DOME, HARDIN COUNTY, ILLINOIS

By Robert D. Trace, Beltsville, Md.

Hicks Dome in the northern part of the Illinois-Kentucky fluorspar-zinc-lead district is a tectonic feature affecting rocks of Devonian, Mississippian, and Pennsylvanian age. It covers about 100 square miles centered in the western half of Hardin County, Ill. The core of the dome, where the rocks dip 10–15 degrees, includes nearly 2 square miles of limestone, chert, and black shale of Devonian age in which there are a few tabular and possibly oval-shaped pipelike masses of breccia, some radioactive areas, and an altered mafic dike (Bradbury and others, 1955, p. 1–3).

Hicks Dome has been described by Brown and others (1954, p. 895–897) as an incipient cryptovolcanic structure. This interpretation is in part based upon data from a 2,944-foot test well in the approximate center of the dome. Most of the sedimentary rocks in the lower half of the hole are brecciated, but the lateral extent and shape of the brecciated mass are not known. According to Brown and others (1954, p. 897–902), the breccia contains thorium, fluorite, barite, calcite, quartz, pyrite, sphalerite, and galena. The thorium and fluorite seem to be closely associated.

No igneous or metamorphic rocks have been identified in the breccia from the center of the dome, although plugs of explosion breccia containing igneous and metamorphosed rocks are known about 7 miles to the northeast and 1.5 and 7 miles to the south (Clegg and Bradbury, 1956, p. 17). The depth to Precambrian rocks at the center of the dome is at least 7,500 feet as shown by data from the M. D. Davis No. 1 test well near Tolu, Ky. (unpublished data, 1956, Shell Oil Company Information Release, mimeographed), about 11 miles to the southeast of the dome.

One of the surface radioactive localities (Bradbury and others, 1955, fig. 1, sample 72) was explored in 1955–56 (under a Defense Minerals Exploration Administration contract) by shallow diamond drilling and trenching in cherty residuum overlying Devonian limestone. The exploration showed two areas of breccia, but most of the radioactivity is concentrated in one—a tabular mass about 10 feet wide that extends N. 24° W. for at least 260 feet, is over 100 feet deep, and dips 85° NE. The highest radioactivity (about 0.1 percent eU) occurs in the central 1 to 2 feet of this tabular body.

A surface sample of the most radioactive material was found by semiquantitative spectrographic analysis to contain a high concentration of rare earths and thorium (table 30.1). The radioactive mineral in the sample was isolated and identified tentatively as monazite. Florencite, a cerium-aluminum phosphate, was found in association with the monazite.

The monazite is in small, soft, earthy, round to subround, brownish-yellow grains about 0.1 to 0.2 mm in diameter. Preliminary X-ray diffraction study shows that the mineral has monazite structure, but its cell size appears to be slightly smaller than that of monazite from other localities. Spectrographic analysis of the hand-picked material shows it to be a thorium-bearing rare-earth phosphate (table 30.1) that differs slightly in composition from most other monazite in that it is relatively rich in yttrium and lean in total rare earths. The abundance of yttrium may account for the small cell size. The relatively low content of cerium and lanthanum and abundance of yttrium suggest that the monazite is relatively unfractionated, or primitive, as described by Murata and others (1953, p. 296–297; 1957, p. 148–150).

Florencite is in small, soft, earthy, round to subround, pale-orange grains about 0.3 to 0.4 mm across. The florencite was identified from X-ray diffraction traces, and confirmed as a cerium-bearing mineral by X-ray fluorescence study (analyst: Richard Larson, 1959).

The narrow surface zone of radioactivity that was sampled is about 200 feet west of the deep test well and dips 85° NE. toward the well. Semiquantitative spectrographic analysis of 8 samples (tables 30.1 and 30.2) obtained by J. W. Hill of the U.S. Geological Survey from the test well and described by Brown and others (1954, p. 899), disclose above-normal quantities of thorium, the rare earths, niobium, zirconium, and beryllium. According to Warner and others (1959, p. 25–28), the BeO content of sedimentary rocks may be as much as 0.004 percent, although generally it is less than 0.001 percent. In the test well, the Be content is as high as 0.06 percent (table 30.2). In general, the greater the radioactivity, the more the Be, rare earths, Nb, and Zr.

The mineralogic and chemical data presented here provide new evidence for the existence of deep-seated

TABLE 30.1.—*Analyses of samples from Hicks Dome, Hardin County, Illinois*

Chemical and semiquantitative spectrographic analysis (weight percent) of surface sample RDT-6 [1]

Width (inches)	0.089–0.099	0.008	N.D.	>10	5–10	1–5	0.5–1	0.1–0.5	0.05–0.1	0.01–0.05	0.005–0.01	0.001–0.005	0.0005–0.001	0.0001–0005
16	eU	U	CaF_2	Si	Fe	Al	Ce, La, K, P	V, Ba, Ti, Nd, Ca, Mg, Th	Sr, Pb, Pr, Mn	B, V, Er, Nb, Tb, Na, Zn	Cu, Gd, Yb, Sm, Dy, Ni, Zr	Eu, Sn, Ga, Co, Lu, Cr, Sc	Be, Mo	Ag

Quantitative spectrographic analysis (weight percent) of monazite hand picked from sample RDT-6 [2]

Ce_2O_3	La_2O_3	Nd_2O_3	Sm_2O_3	Gd_2O_3	Pr_2O_3	Dy_2O_3	Y_2O_3	ThO_2	P_2O_5	SiO_2	Al_2O_3	MgO	CaO	Fe_2O_3	TiO_2	Total
16	11	6	2	1.5	2.5	1.5	4.2	4.4	29	4.4	2.2	0.2	3.8	6.6	2.7	98

Semiquantitative spectrographic analysis (weight percent) of test-well samples [3]

Sample no.	Depth (feet)	XX.	X.+	X.	X.-	0.X+	0.X	0.X-	0.0X+	0.0X	0.0X-	0.00X+	0.00X	0.00X-	0.000X+	Tr
1	1725–1750	Ca	Si	Mg	Al, Fe	K, Ba	Ti	Th, Y, Na	Mn, Sr	Pb, Zn	La, Dy, Sc, V	Yb	Cr, Cu	Bi, Ni	----------	Ga
2	1785–1815	Ca	Si	Mg	Al, Fe	K	Ti	Th, Y, Na	Mn, Sr	Pb, Zn Ba	La, Dy, Sc, V	Yb	Cr, Cu	Bi, Ni	----------	Ga
3	1975–2000	Ca	Mg	Si	----------	Al, Fe, Ba	K	Na	Mn	Ti	Sr	Pb, V Y	----------	Sc	Cr, Cu, Ni, Yb	
4	2150–2175	Ca	Si, Mg	----------	----------	Al, Fe	Ti	Y, Ba	Th, Na, Mn	Sr	Dy, V	Yb	Pb, Sc	Cr, Cu	Ni	Bi, La
5	2370–2400	Ca	Si	Fe, Mg	Al, K	----------	Ti	Mn, Na	Ce, Th, Y, Ba, Sr	La	Dy, Nd V	Sc	Cr, Cu Yb	Co, Ni	----------	Pb
6	2425–2450	Ca	Si, Mg	Al, Fe, K	----------	Ti	Mn, P, Na	----------	Ce, Ba, Sr	La	Nd, Se, V, Y	Cr	Ni, Pb, Yb	Co, Cu	----------	Dy, Ga, Th
7	2450–2475	Ca	Si, Mg	----------	Fe	Al, K	Ti	Ba, Na, Mn	----------	Sr	La, Pb	V, Y	Cr, Cu, Sc	Ni, Yb	Co	Ce, Dy, Ga, Th
8	2900–2925	Ca	Mg	----------	----------	Fe, K	Al, Ba	----------	Mn, Na	Ti	Pb, Sr	Y	Cu, V	Cr, Ni, Sc	Yb	

[1] Analysts, Katherine E. Valentine, C. Johnson, and G. Daniels. Sample RDT-6 analyzed for D. M. E. A. contract.
[2] Analyst, Harry J. Rose, Jr., 1960. Analysis on 15 mg. Sample diluted in graphite.
[3] Analyst, G. W. Beyes, Jr., 1953. Be, Nb, and Zr not shown, see later analysis in table 30.2.

igneous activity in the region of the Illinois-Kentucky fluorspar-zinc-lead district, but by themselves may neither confirm nor deny the existence of a connection between the igneous activity and the mineralization of the district.

TABLE 30.2.—*Analysis of samples from Hicks Dome, Hardin County, Illinois*

[Chemical and semiquantitative spectrographic analysis (weight percent) of additional constituents in test well samples [1]]

Sample	Depth (feet)	eU	U	CaF_2	Be	Nb	Zr
1	1725–1750	0.029	0.001	6.4	0.06	0.15	0.03
2	1785–1815	.024	.001	9.6	.06	.15	.03
3	1975–2000	.001	----------	1.3	.007	.03	.005
4	2150–2175	.016	.001	7.9	.06	.08	.02
5	2370–2400	.011	.001	10.8	.01	.10	.01
6	2425–2450	.008	.001	6.6	.006	.10	.02
7	2450–2475	.004	----------	4.6	.003	.03	.01
8	2900–2925	.001	----------	2.8	.005	.01	.006

[1] Analysts, Pauline J. Dunton, Ferman W. Montjoy, and P. Stuch.

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United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 939
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY
REFER TO:

BRANCH OF CENTRAL MINERAL RESOURCES

February 12, 1986

Mr. John Lee Carroll, Manager
Silver Resources Corporation
515 Madison Avenue, 32nd floor
New York City, New York 10022

Re: OME 6873 (fluospar, et al)
Kerlin, Goelet and Goelet d/b/a/
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Mr. Carroll:

Last year we received the return of our copy of Form MME-63 informing us that the property referred to above has not changed in ownership, lease, or sublease, and that there has been no production on the Hicks Dome Property.

It is known that Hicks Dome contains one of the largest resources of thorium in the United States, as well as a large resource of niobium, rare earths, beryllium, and fluorite. Is the property being developed so as to mine multi-products or has it remained essentially the same since April 1976, the date of our Certification of Discovery?

Has there been any metallurgical work completed on the potential ore to bring the property into production?

Part of the reason we entered into an exploration program with you was to expand the potential occurrence of thorium, niobium, rare earths, beryllium, and fluorite in the Hicks Dome's highly unusual type of mineralization. Our country, as you well know, is poorly developed in the readily available resources of these particular minerals.

Twelve holes were completed - OME 1 through OME 12, totalling 29,339 feet of which 3,670 feet were rotary drilled with 25,669 feet cored. We assume that you are keeping the core and cuttings as prescribed in the contract; that is, keeping them stored in boxes identified with the hole number, with markers in the core sections indicating the depths represented. This was to be done in anticipation that we might need them at a later date.

Your thoughts and plans concerning Hicks Dome and its potential will be greatly appreciated. I would like to visit the property later on in the year.

Thank you for your cooperation.

Sincerely yours,

J. William Hasler

J. William Hasler, Chief
Office of Minerals Exploration

JWHasler:js

Copies to: G. H. Allcott
H. A. Tourtelot
C. H. Thorman
R. D. Trace
A. V. Heyl

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

Messrs. Gilbert Kerlin, Robert G. Goelet,
Francis Goelet d/b/a Hicks Dome Account
c/o Mr. John L. Carroll
Room 4120, 345 Park Avenue
New York, New York 10022

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Pursuant to Article 7 of the referenced contract, as amended, the Government hereby certifies that mineral or metal production may be possible as a result of the exploration work.

Therefore, royalties shall be paid to the Government as provided in the contract on all production from the land described in the contract from September 26, 1972, to September 26, 1989, or until the total amount contributed by the Government under the contract ($118,206.55, plus accrued interest) is fully repaid, whichever occurs first. Under provisions of Article 1(c) of the Contract, as amended, and Paragraph 2 of Amendment No. 4, thereto, simple interest accrues on the amount contributed by the Government at the annual rate of:

8-1/4 percent on the first $47,725.00,
9 percent on the amount between $47,725.00 and $67,493.00,
8-3/4 percent on the amount between $67,493.00 and $113,558.00, and
9-3/4 percent on the balance to $118,206.55.

The payment of royalties is secured by Performance Bonds executed by the Aetna Insurance Company under dates of September 29, 1972, June 22, 1973, January 28, 1974, and July 5, 1974.

Royalty payments on any production computed as provided in the contract should be made in favor of the U.S. Geological Survey and mailed or delivered to the Chief, Office of Minerals Exploration, U.S. Geological Survey, National Center, 12201 Sunrise Valley Drive, Reston, Virginia 22092. Each payment should be accompanied by two copies of settlement sheets or other

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

suitable sales evidence showing the date of sale, name of the purchaser, the quantity and grade of the production sold, the price per unit, and the gross proceeds and allowable deductions therefrom. The purchaser should be notified of the Government's royalty on production and directed to pay the royalty, computed as provided in the contract, directly to the Government.

The Office of Minerals Exploration should be promptly notified upon the commencement of any production and upon any extended cessation thereof. Production unsold or unused six months after extraction from the ground should be reported promptly to the Office of Minerals Exploration.

Attention is specifically invited to the provisions of Article 2(c) of the Contract referring to the preservation of the Government's royalty rights. Two true copies of any instrument transferring, surrendering or encumbering any of said rights shall be furnished to the Office of Minerals Exploration.

Dated this _____ day of _____, 1976.

THE UNITED STATES OF AMERICA

_____

Chief, Office of Minerals Exploration
U.S. Geological Survey

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

Messrs. Gilbert Kerlin, Robert G. Goelet,
Francis Goelet d/b/a Hicks Dome Account
c/o Mr. John L. Carroll
Room 4120, 345 Park Avenue
New York, New York 10022

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

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Therefore, royalties shall be paid to the Government as provided in the contract on all production from the land described in the contract from September 26, 1972, to September 26, 1989, or until the total amount contributed by the Government under the contract ($118,206.55, plus accrued interest) is fully repaid, whichever occurs first. Under provisions of Article 1(c) of the Contract, as amended, and Paragraph 2 of Amendment No. 4, thereto, simple interest accrues on the amount contributed by the Government at the annual rate of:

8-1/4 percent on the first $47,725.00,
9 percent on the amount between $47,725.00 and $67,493.00,
8-3/4 percent on the amount between $67,493.00 and $113,558.00, and
9-3/4 percent on the balance to $118,206.55.

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AMERICAN REVOLUTION BICENTENNIAL 1776-1976

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Attention is specifically invited to the provisions of Article 2(c) of the Contract referring to the preservation of the Government's royalty rights. Two true copies of any instrument transferring, surrendering or encumbering any of said rights shall be furnished to the Office of Minerals Exploration.

Dated this _____ day of _____, 1976.

THE UNITED STATES OF AMERICA

_____

Chief, Office of Minerals Exploration
U.S. Geological Survey

United States Department of the Interior
GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

RECEIVED
APR 14 1975
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

APRIL 11, 1975

Mr. Joseph A. Porter
Geologist
Box 447
Rosiclare, Illinois 61982

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Mr. Porter:

Thank you for the geologic and assay data on holes OME-7 through OME-12. Assay data from the assay labs indicated for the following samples were not included in the material received:

Hole No.	Samples for which assay data were not furnished: McDonald	Skyline
8		085, 112, 113
9		H338 thru 380
11		114
12	631 thru 636	

We would appreciate receiving these assays, too, if they are available.

I hope that you can submit the final voucher(s) in the near future. I will be out of the country between May 28 and June 19, and from about July 14 to August 7, and would appreciate being able to process the voucher or vouchers necessary to complete this contract before I leave on the first trip. If that is not possible, I would try to process them between trips. The termination date of the contract is June 26. We should have the voucher processing done before then, if possible.

Your final report on the project, required by Article 5(c) of the contract, will entail considerable consolidation of the extensive information obtained from drilling and analytical work. I suggest that you consider summarizing the overall geology and economic results of the work in brief statements illustrated with maps and cross-sections, and referring to previously-submitted drill logs, sections, and assay summaries and descriptions of individual holes. Cost data will have to be compiled from individual hole records and vouchers. We will be unable to have the contract audited before receiving your final report. These suggestions are offered in order to ease the task of preparing it.

Sincerely yours,

Harold Kirkemo, Chief
Office of Minerals Exploration

Copies to: Heyl
Trace
Laurence

cc:
DRF
MR Rdg.
OME Rdg.
OME Files
Mr. Kirkemo

HKirkemo/gpw

Omt 6873
Karlin, Gaebel + Gaebel
d/b/a Hicks Dome
Hardin Co., Ill

Form MME 63
(May 1970)

REQUEST FOR INFORMATION ON CERTIFIED PROJECT OR PROJECT UNDER ROYALTY AGREEMENT

1. Since February 12, 1986, has there been a change in ownership, lease, or sublease? *If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before.* Yes [X] No [ ]

In 1987, leases and properties pertaining to this project were transferred to Hicks Dome Corporation, an Illinois corporation whose address is P.O. Box 3, Herod, Illinois 62947 and whose ownership is substantially the same as the ownership of Hicks Dome Account.

2. Since February 12, 1986, has there been any production from the land subject to the contract? Yes [ ] No [X]

A. If so and it was shipped, give quantity, value, and name and address of purchaser.

Purchaser (*name and address*)	Quantity	Value

B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity (*tons*)	Estimated Grade	Location
Ore			
Concentrates			
Other			

3. Since February 12, 1986, has any production been transported through workings (*see of contract*)? Yes [ ] No [ ]

If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name	Title
John Lee Carroll	
Address 515 Madison Avenue New York, N.Y. 10022	**Date** November 24, 1987

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 939
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY
REFER TO:

BRANCH OF CENTRAL MINERAL RESOURCES

June 17, 1986

Mr. Jim Baxter, Geologist
Illinois State Geological Survey
615 East Peabody Drive, Rm. 121
Champaign, Illinois 61820

Re: OME 6873 (fluospar, et al)
Kerlin Goelet and Goelet
d/b/a/ Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Jim:

Enclosed are the following copies of information which we discussed:

Exploration Contract, Hicks Dome Account

Goverment Certification that minerals or metal production might be possible as a result of the exploration work

Office of Minerals Exploration final report written by Harold Kirkemo, former chief of OME

This report is a particularly good one reviewing the work completed.

The report is still company confidential and we would appreciate your treating this as confidential material. It may assist you in your studies of Hicks Dome.

Sincerely yours,

J. William Hasler

J. William Hasler, Chief
Office of Minerals Exploration

JWHasler:js

Enclosures

Copies to: G. H. Allcott
H. A. Tourtelot
C. H. Thorman
W. P. Pratt
A. V. Heyl
J. J. Eidel, Ill. St. Geol. Survey

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

In Reply Refer To:
Mail Stop 953

June 7, 1977

RECEIVED
JUN 9 - 1977
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

Mr. John L. Carroll
Room 4120, 345 Park Avenue
New York, New York 10022

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet, and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Mr. Carroll:

The U.S. Geological Survey is making a survey of domestic thorium resources--a task requiring sample collecting, laboratory analyses, and resource appraisals of the principal thorium deposits, and preparation of a report by May 1, 1978.

Preliminary mineralogical studies some years ago by Allen Heyl and Mortimer Staatz, USGS geologists, of a few samples of core obtained from the OME drilling project cited above confirmed that the Hicks Dome deposit contains thorium. In order to determine whether or not a large resource of thorium is present, investigation of the core, cuttings, or pulp obtained under the OME contract is needed, and we would appreciate access to the material for examination and sampling for this purpose.

The data obtained from our studies will be shared with the Operator as we have shared the results of previous investigations.

Because of the tight schedule for the thorium project, we would appreciate an early response to this request. Unless otherwise advised, we assume that the OME material is in the custody of Mr. Joseph A. Porter, and that USGS personnel would contact him to make arrangements for access. The latest addresses we have for Mr. Porter are:

Business:
P.O. Box 3
Herod, Illinois 62947

Home:
104 E. Walnut Street
Harrisburg, Illinois 62946

Sincerely yours,

Harold Kirkemo, Chief
Office of Minerals Exploration

HKirkemo/gpw

cc: Allen F. Heyl
R. Laurence
R. Trace
E. Stott
OME Files (4)
DRF
MR Rdg.

rcvd 6/6/77

United States Department of the Interior

GEOLOGICAL SURVEY
Box 25046
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO: Mail Stop 916

Office of Energy Resources
Branch of Uranium and Thorium Resources

June 2, 1977

Memorandum

To: Harold Kirkemo

From: Mortimer Staatz
Branch of Uranium and Thorium Resources

Subject: OME drill core of the Hicks Dome, Illinois project

Since the de-emphasizing of the breeder reactor, there has been considerable interest in thorium. As a result the thorium group of the Uranium and Thorium Resources Branch has recently been assigned the task of making a one year survey of the United State's principal thorium resources. The Hicks Dome deposit is known to have thorium, and it may be one of the United States larger resources of this metal. Thus, it is important to obtain as reliable data as possible on this deposit. Because of the Hicks Dome thorium content I made a visit several years ago to this area with Allan Heyl, and have done some preliminary mineralogy on this deposit. The holders of the OME loan have been most interested in this property as a possible source of fluorspar and or barite and hence have many analyses for these two minerals. The property is probably more valuable for its combined minor elements, and the company has had a number of analyses made for beryllium, niobium, lead, and yttrium. As thorium has had no viable market in the past, they have not had any thorium analyses made. The only ones present are on a few samples collected by me or Allan Heyl. In order to obtain a representative grade for thorium in this large deposit, I would like to obtain permission to sample core from various OME drill holes. We would appreciate your contacting Mr. Carroll, who represents the company, to clear the way for us to get some of the core obtained under the OME contract. We would be more than willing to share the data obtained on the drill cores with the company. Hopefully we can get started as soon as possible, as the samples have to be collected and analyzed, resources calculated, and final report finished by May 1, 1978.

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

April 9, 1976

Mr. John L. Carroll
Room 4120, 345 Park Avenue
New York, New York 10022

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Mr. Carroll:

Enclosed for your files is a copy of a Memorandum Audit Report and Cost Review of Contract 2306 prepared by the Office of Audit and Investigation, Department of the Interior.

The facts and figures noted agree with the records in our files.

We will issue a Certification of Possible Production on this project in the near future.

Sincerely yours,

Harold Kirkemo, Chief
Office of Minerals Exploration

Enclosure

Copy to: Joseph A. Porter, Geologist
P.O. Box 3
Herod, Illinois 62947

cc: R. Trace
R. Laurence

DRF
MR Rdg.
OME Rdg./Files
Mr. Kirkemo

HKirkemo/gpw

RECEIVED
APR 12 1976
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

United States Department of the Interior

OFFICE OF THE SECRETARY
OFFICE OF AUDIT AND INVESTIGATION
EASTERN REGION
Ballston Towers #1
800 N. Quincy Street, Room 401
Arlington, Virginia 22217

April 1, 1976

Memorandum Audit Report

To: Director, Geological Survey

From: Regional Audit Manager

Subject: Cost Review of Contract No. 2306
Docket No. OME-6873 (Fluorspar, beryllium, rare earths, thorium, niobium) Hicks Dome Account

At the request of the Chief, Office of Minerals Exploration (OME), we have made a cost review of OME files applicable to the subject contract. Our review, which was conducted in Washington, D.C., was completed in March 1976.

Contract No. 2306 (Contract) was awarded September 26, 1972 at a maximum allowable cost of $95,450 with OME participating to a maximum of $47,725. Work under the Contract was to begin on October 10, 1972, and was to be completed by June 10, 1973. Contract Amendments extended the contract completion date to June 26, 1975, and revised the estimated cost from $95,450 to $276,110.

The contractor was to explore, by diamond core drilling, for fluorspar-beryllium-rare earths-thorium-niobium ores in mineralized breccias in the Hicks Dome cryptovolcanic structure.

Repayment of the disbursed Federal funds plus simple interest set at a different rate for each Contract stage was to be made on the basis of established royalties on all commodities produced from the land during the exploration operations and for a period of 17 years from the date of the Contract should a certification of possible production be issued by OME.

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

The contractor submitted 19 vouchers showing costs incurred of $259,137 of which OME accepted $255,516 and reimbursed the Operator $118,207 for OME participation.

The units of work authorized and approved under the Contract are summarized on the attached exhibit. In our opinion, the claimed and accepted costs were properly incurred and are allowable under the terms of the contract.

Frank V. Tassinari

Attachment

EXHIBIT

Cost Review of Contract No. 2306
Docket No. OME-6873 (Fluorspar, beryllium, rare earths, thorium, niobium)
Hicks Dome Account, A Partnership
Meridian, Illinois
October 10, 1972, through June 26, 1975

Allowable Costs	Costs claimed and approved by Audit
Stage I	
Category:	
(1) Independent Contracts	$60,436
(2) Personal Services	9,314
(3) Operating Materials and Supplies	1,491
(7) Miscellaneous	2,144
Stage II	
Category:	
(1) Independent Contracts	53,679
(2) Personal Services	6,802
(3) Operating Materials and Supplies	797
(7) Miscellaneous	2,399
Stage III	
Category:	
(1) Independent Contracts	98,007
(2) Personal Services	14,280
(3) Operating Materials and Supplies	1,553
(7) Miscellaneous	3,961
Stage IV	
Category:	
(7) Miscellaneous	4,274
Total Allowable Cost	259,137 a/
Government Participation	118,207

a/ Includes $3,621 of excess allowable type costs not accepted by OME.

Hicks Dome
OMEA 6873

Oman on stream in early 1985. China is continuing to develop new mines for drilling mud and is also developing new mines for chemical and filler grade barite.

Outlook. Barite consumption by the US drilling industry is expected to decrease by 3%-5% in 1986. The drilling rig count is estimated at 1,800-1,900 during 1986. Non-oilfield demand will probably remain about the same as in 1985.

US mine production will probably decrease due to lower f.o.b. prices and continued low water freights on imported ore. Imported ground barite for drilling muds will decrease as the major importer of finished product has reported that they will no longer import barite.■

BISMUTH

STAGNANT ECONOMY DEPRESSES BISMUTH

Louis D. Fitzgerald, manager, by-products sales, Asarco Inc.

As the US economy slipped in 1985, bismuth consumption suffered a small decrease. World production, however, continued to increase due to escalating prices in 1984. Major purchases by Russia and China that caused disruptions of supplies in 1984 were not repeated in 1985.

World consumption was very consistent at nearly 7 million lb, while world production was estimated at about 7.4 million lb. A weakening in metallurgical and fusible alloy usage and an appreciable drop-off in chemical usage characterized the slump in US consumption. US usage fell by about 2.4 million lb, about 20% lower than the previous year. European and Japanese consumption was reportedly sufficiently increased to offset the US decline.

Prices. The year 1985 began with bismuth prices at an artificially high level of $6.60/lb, supported primarily by Russian and Chinese purchases late in 1984. With no additional buying from the Chinese, prices deteriorated quietly through April and collapsed by nearly $1/lb in May. Prices at the end of June were at the $4.60/lb level. July saw more slippage, bottoming at near $4.00/lb. August and September showed a false recovery, with prices temporarily reaching the $4.60/lb level. Another slippage followed in October, November, and December, ending the year slightly above $3.50/lb.

European markets were saturated with bismuth and the only published producer price was withdrawn on November 4 with a list of $6.50/lb and a market price below $4.50/lb. The market prices were muddled by international dealers with claims that bismuth sold for as little as $2.50/lb in late October. This did not seem to be a realistic price, since the market rebounded quickly in November above the $4.00/lb level before sliding again in December.

Supply. Mexico was the dominating factor in bismuth production, outstripping its 1984 exports to the US by over 40%. Belgium seemed to have come on a large source of bismuth, quadrupling its 1984 exports to the US. Peru, on the other hand, seemed to have sold out its production to Russia and China in 1984. It shipped only a third of normal quantities to the US in the first nine months, recovering somewhat in the fourth quarter. UK shipments were off slightly, while Korean and Japanese shipments were appreciably lower. In total, US imports are estimated at about 1.9 million lb or nearly 80% of US consumption. Inventories grew during the year by about 100,000 lb. Low prices for lead and silver are causing mine closings, which may reduce bismuth availability in the immediate future.

Demand. Metallurgical additives were down appreciably from their record year of 1984. Along with fusible alloys, they declined by 15%. Exports were low for the entire year, especially in the last three quarters. Chemical applications also declined by nearly 20%, a major factor being pigments and specialty chemicals.

Technology. Little research was done in the bismuth area in 1985. Steel markets again ran into problems, and consumption in that area declined below 120,000 lb. Some expanded use of bismuth took place in thermoelectric devices, primarily for government electronics applications.■

BERYLLIUM

BOOM GOES BUST

Joseph Rosta, senior editor, METALS WEEK

Recession in the US electronics industry burst beryllium's balloon in 1985. What appeared to be a temporary slowdown in demand became something of a rout as the year progressed. Brush Wellman reacted by focusing on its specialty and putting its S. K. Wellman frictions subsidiary on the sales block. Cabot Corp. elected to swear off metals entirely.

Markets. Consumption of beryllium on all fronts paled in 1985. Despite the fact that the National Defense Stockpile remained far short of its goal of 864,000 lb under the proposed revision (800,000 lb under current goals) of 98% beryllium metal, the Administration's freeze on stockpile purchases and its controversial stockpile revision plan kept the GSA's buying appetite under control.

Demand for beryllium by the Department of Defense for its missile program was strong, industry sources said, as was offtake from other high reliability users. Beryllium is essential in guidance systems, and beryllium-copper is used in such applications as connectors.

The electronics industry, however, was the bane of the beryllium business. Demand from the semiconductor, computer, and telecommunications sectors virtually disappeared.

Sales of beryllium-copper strip and beryllia ceramic dropped sharply, as production of semiconductor packages and chip carriers fell.

Meanwhile, beryllium-copper rod, bar, tube, extrusions, and billet shipments to the oil sector softened. The alloys are used for drilling, instrument housing, and measurement applications.

Prices. Brush Wellman reversed its decision to increase its beryllium-copper prices by 5% on Jan. 6, 1986. The quotes remain at $7.25/lb for Be-Cu 25, $5.35/lb for cast ingot, and $144/lb for master alloy. The retraction came "after we reassessed the market," according to the company. Brush

Wellman originally pushed for the increase because of higher unit costs. Cabot Wrought Products declined to follow its competitors' move, leaving open the possibility of a price war and potential loss of market share for Brush Wellman.

Beryl ore quotes, meanwhile, continued to erode, sliding to $85-$100/stu from $100-$120/stu.

Trade. The slowdown in beryllium demand took its toll on ore suppliers. Complicating the market were uncertainties about the future of Cabot Wrought Products, following the parent's decision to sell off the division. Cabot Mineral Resources, the unit's trading arm, was disbanded in late December 1985, removing a major factor in the beryl ore business. It was unclear just how much ore Cabot Wrought Products purchased last year.

Brush Wellman stayed completely out of the free market in 1985. Although the producer took delivery on existing supply contracts, there were reports that it was asking for minimum shipment terms.

Beryl ore shipments slid again, for the third year in a row, dropping to 131,680 lb from 140,000 lb in 1984, off 6%, according to the US Bureau of Mines.

Industry. The year 1985 was traumatic for both Free World beryllium producers. Cabot Wrought Products found itself orphaned in October, with Cabot Corp. embarking on a major restructuring that included putting most of its metals operations up for sale. The sector, under the Cabot Wrought Products umbrella, accounts for 40% of Cabot's assets but was not meeting financial goals.

Analysts were puzzled over the timing of the move, noting that Cabot reorganized its operations last July into 13 profit centers with three manufacturing centers: one each at Reading, Pa., and Elkhart, Ind., (beryllium-copper); and one at Kokomo, Ind., (other alloys). Cabot took a $145 million aftertax writedown in the fourth quarter of its fiscal year, ended Sept. 30, 1985, which included the planned sale of its Westar natural gas pipeline. Moody's Investors Service lowered its rating on Cabot's senior debt to BAA1 from A3 in November, citing "uncertainties" regarding the divestiture.

Brush Wellman had divestiture on its mind as well in 1985. The company decided to get out of the friction products business by puttings its S. K. Wellman unit up for sale, taking a $10 million charge in the fourth quarter. The move gave the company a $3.8 million loss for the period vs. earnings of $9.8 million in fourth quarter 1984. Net income for the year dropped to $17.9 million from $41.5 million; sales fell to $242.9 million from $281.1 million in 1984.

In addition to the softness in electronics-related markets, Brush Wellman attributed part of its lower earnings to start-up costs from new facilities and product lines. However, the company remained committed to expansion of its beryllium-copper strip capacity. In addition, as part of an expansion into Far East markets, the company is building a $6.5 million clad metals and ceramics plant in Japan. The plant, on which construction began in first quarter 1986, will be in production in the third quarter. TMI technology will be used. Brush Wellman estimates that sales will reach $20-$25 million within five years.

Outlook. While the electronics business seems to have hit bottom, beryllium's near-term future is foggy. With the Graham-Rudman budget balancing hacksaw poised over defense spending, it is too early to tell whether some beryllium sales will suffer. The possibility of additional metal purchases for the stockpile looks especially dim, considering the controversiality of the issue.

Nevertheless, work on the next generation of commercial aircraft could start nibbling on the metals pipeline before year end. Brush Wellman, at least, believes that beryllium-copper stocks held by the electronics industry have been depleted. ■

COLUMBIUM AND TANTALUM

A. S. Aktar, president, Techno-Economic Consulting Inc. (Columbium)

Mark Emerson, president, Resource Exchange Corp. (Tantalum)

COLUMBIUM

US columbium consumption in 1985 was 7.7 million lb, a slight increase from 7.67 million lb in 1984. Ferrocolumbium consumption was unchanged at 5.4 million lb. Most columbium consumption was in the form of ferrocolumbium by the steel industry and columbium alloys and metal by the aerospace industry. The estimated value of domestically-produced ferrocolumbium, nickel columbium, and metal in 1985 was $40 million. End uses as metal and alloys in fabricated form were: construction 40%, transportation 27%, and oil and gas industries, machinery, and other, each 11%.

Supply. Since 1959, there has been no US columbium mining industry. The US imports all of its columbium requirements, with Brazil supplying about 74%, Canada 9%, Thailand 6%, and other countries 11%. Worldwide available reserves are more than adequate to furnish current mine production capacity for the foreseeable future.

Cia. Brasileira de Metallurgia e Mineracao (CBMM) and Mineracao Catalao de Goias are the two largest columbium producers in the world. Brazil's existing plant capacity is 42,000 mt/yr. Niobec Inc. is the Canadian producer.

The US General Services Administration (GSA) maintains a stockpile of columbium supplies. In addition to the quantities shown in the table, the stockpile contains 869,000 lb of non-stockpile-grade concentrate and 330,000 lb of non-stockpile-grade ferrocolumbium.

Columbium mine production and reserve base*
(lb of contained columbium)

Country	Mine production 1984	Mine production 1985	Reserve base
US	—	—	Negligible
Brazil	23,140,000	24,000,000	8,000,000,000
Canada	4,330,000	4,900,000	700,000,000
Nigeria	100,000	100,000	200,000,000
Zaire	30,000	30,000	200,000,000
Other market economy countries	322,000	350,000	19,000,000
Centrally planned economies	NA	NA	NA
World total (excluding centrally planned economies)	27,922,000	29,000,000*	9,100,000,000*

Source: US Bureau of Mines; NA—Not available; (e)—Estimated; *Rounded.

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

September 3, 1975

Memorandum

To: Allen Heyl
Geologist, Central Mineral Resources

From: Harold Kirkemo
Chief, Office of Minerals Exploration

Subject: Your request for drill core from OME-6873 (Fluorspar, et al)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

I talked with Mr. John L. Carroll this morning concerning your request to acquire additional drill core from the Operator's Hicks Dome property.

Mr. Carroll regrets that he has to decline your request at this time. He now is in a critical stage of land dealings in the Hicks Dome area and hopes by the end of the year to have entered into negotiations with possible investors to finance development of the deposit. He wants the drill core intact and available on the property in the event the prospective investors wish to examine it. As these reasons are logical, I could not argue against them, especially since any repayment to the Government of its investment depends on getting the property into operation.

Mr. Carroll is very concerned about keeping a tight lid on information obtained from the OME drilling project. He said that premature or unauthorized publicity about these findings could jeopardize return of the investment of several hundreds of thousands of dollars by the Operators of the OME project. He mentioned that news about the project already was causing problems for them. I assured him that we would not issue any information to anyone about the project.

This is a difficult situation for us because some factual information has been released, inadvertently I'm sure, but we must keep a tight lid on everything from now on. Carroll assured me that upon conclusion of their present negotiations, presumably if successful, you again would be allowed access to whatever you need at the project. He will talk with Mr. Porter regarding disposal of core and said he believed that all of the OME core was intact.

Mr. Porter is agent for Mr. Carroll and the Operator and acts only on their behalf and at their specific request. His inability or reluctance to accede to your request for the core was based on his responsibility to Mr. Carroll.

Harold Kirkemo

Harold Kirkemo

Copies to E. W. Tooker
Robert Trace
J. W. Hasler
R. A. Laurence

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

August 29, 1975

Mr. John L. Carroll
Room 4120, 345 Park Avenue
New York, New York 10022

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Mr. Carroll:

An opportunity has developed for our Denver staff to obtain a substantial quantity of core samples from the Hicks Dome property for analytical study in the Denver laboratories of the Geological Survey. The purpose of this letter is to obtain your permission for members of our staff to pick up the material.

Allen Heyl, who is leading the laboratory and field studies of the Hicks Dome area, has the services of a geology graduate student, David Jones, for a few weeks, and proposes to have Mr. Jones pick up certain drill core samples at the property and transport them by truck to the Denver laboratory. Jones could be at the property on or about September 5 and would be assisted by Robert Trace, U.S.G.S., Kentucky, in selecting and loading the core boxes.

Heyl wishes to obtain alternate boxes of core from holes OME-2 and OME-7. As in the past, results of studies on this core would be furnished to Mr. Porter.

This proposal was discussed with Mr. Porter by Heyl, and then referred to me after Heyl was unable to contact you by phone because of your absence from the office.

I understand that you are expected to be in your office on Wednesday, September 3. I will phone you on Wednesday, and hope that you will have had an opportunity to read this beforehand. I have to contact Heyl on the same day if the proposed schedule is to be met.

In the event we have future opportunities to obtain core, we would appreciate retention of all core now in storage at the property.

Sincerely yours,

Harold Kirkemo, Chief
Office of Minerals Exploration

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

RECEIVED
SEP 6 1973
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

August 30, 1973

Messrs. Gilbert Karlin, Robert G. Goelet
Francis Goelet d/b/a Richs Bunn Account
c/o Mr. John L. Gassell
Room 4130, 345 Park Avenue
New York, New York 10022

Re: OGE-4673 (Finnegan, et al.)
Karlin, Goelet and Goelet d/b/a
Richs Bunn Account
Richs Bunn Property
Randle County, Illinois
Contract 2304

Gentlemen:

This letter will authorize additional drilling on Stage II of the subject contract, effective as of August 29, 1973, and utilizing funds encumbered on Stage I.

An amendment (proposed No. 2) to the contract for this purpose will be prepared after my return to duty on or about September 24, 1973. The amendment will specify the same per-unit costs as are set forth in Amendment No. 1 to the contract, and will not increase the estimated cost of the contract, or the aggregate amount which the Government may be required to contribute.

I agree with the recommendation offered by Mr. Joseph A. Porter, project geologist, that these funds should be used to drill a hole tentatively located on the First State Bank lease about 800 feet southeast of Drill Hole OGE-3.

Sincerely yours,

Harold Kirkemo

Harold Kirkemo, Chief
Office of Minerals Exploration

Copy to: J. A. Porter
Robert D. Trace
R. A. Lawrence

cc: DRF
MR Rdg.
OME Files
OME Rdg./Mr. Kirkemo

HKirkemo/gpw

RECEIVED
AUG 13 1973
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

August 7, 1973

Memorandum

To: Robert D. Trace, Geologist

From: Chief, Office of Minerals Exploration

Subject: OME-6873 (Fluorspar et al)
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois

Thank you for Interim Report No. 4 on the subject project.

Joe Porter phoned me on July 26 to report on the results of OME 5 which were essentially what you have reported. He was pleased with the grade of material encountered, and reported that a wedge had been placed in the hole above the mineralized section in order to drill an NX hole through the mineralized zone to obtain material for metallurgical testing. He asked if the contract could be amended to allow OME participation in the cost ($1,500 to $2,000) of this drilling. In view of the as yet unknown cost of drill bits used in Stage I, I suggested waiting until those costs are known before deciding about another amendment.

As you know, budget constraints limited OME participation in this project which probably merits much more help. In the event we have funds available in FY 1974 to support additional drilling (holes 7 and 8, for instance), would you advise favorable consideration of a request for this purpose? It seems that the potential for outlining a very significant resource of fluorspar here merits serious consideration. What is the outlook for developing the deposit for production within the period of royalty obligation (about 14 years remaining on present contract)? If we amend the contract, perhaps we should extend this period to 20 or 25 years from date of contract so as to allow more time for development and mining and return of Government investment through royalty payments on production.

I would appreciate your views and recommendations on this matter. I have not discussed with Porter the possibility of help for more holes since we discussed plans for Amendment No. 1 under which Holes 5 and 6 are being drilled.

Harold Kirkemo

Harold Kirkemo

cc: Region IV
DRF/MR Rdg./OME Rdg./OME Files/MR. Kirkemo

HKirkemo/gpw

RECEIVED
AUG 1 3 1973
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

July 27, 1973

OME-6873 (Fluorspar et. al.)
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois

INTERIM REPORT NO. 4

TO: Harold Kirkemo, Chief
Office of Minerals Exploration
Washington, D. C. 20244

FROM: Robert D. Trace, Geologist
U. S. Geological Survey
Princeton, Kentucky 42445

On July 25, 1973 the writer visited the subject project and examined the mineralized portion of the core from OME 5.

Since the last interim report dated April 30, 1973, OME 4 was bottomed at 2,200 feet (See Porter's May report). According to Porter, "Skyline" assays from 1,928 to 2,058 (130 feet) averaged 10.5percent CaF_2.

OME 5 (for location, see Porter's Application to extend, dated April 12, 1973) was down to 2,375 and will probably bottom around 2,400. This hole appears to have higher grade mineralization than any previous OME hole. Porter estimates as follows:

2025-2055	4-5 percent (CaF_2)
2055-2150	7-8 percent
2150-2168	3 percent plus or minus
2168-2243 (75 feet)	15 percent plus or minus

The best mineralized zone (75' of 15 percent CaF_2) is typical fine "purple breccia". The only pecularity noted is that OME 5 contains more coarse crystals of barite than any previous hole. A possible continuity of "ore" zone problem exists between OME 3 and 5. The best mineralized zone in OME 5 is about 150 feet deeper than the best mineralized zone in OME 3. This could be the result of a 15 degree dip--somewhat <u>un</u>anticipated.

OME 6 has been "rotaried" to 725 feet. The core drill rig from OME 5 will eventually move to OME 6.

June 29, 1973

Messrs. Gilbert Kerlin, Robert G. Goelet,
Francis Goelet d/b/a Hicks Dome Account
c/o Mr. John L. Carroll
Room 4120, 345 Park Avenue
New York, New York 10022

Re: CMX-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Gentlemen:

Enclosed are the original and three copies of proposed Amendment No. 1 (five pages, performance bond, and one map, Figure 1, revised) to the subject contract, signed for the Government. An extra copy of the amendment is being sent to Mr. Joseph A. Porter, Geologist, Rosiclare, Illinois, who is in charge of the project work for you.

If the proposed amendment is satisfactory to you, all copies should be signed on page 5 by each of the three general partners, and the following copies returned to this office:

Government Copy
Field Office Copy
Branch of Financial Management

The Operators' copy should be retained for your files.

If any part of the proposed amendment does not meet with your approval, please return the original and all copies to this office together with your comments for our consideration.

The 9 percent interest in Article 1(c), as amended by paragraph (ii), applies to the additional funds ($19,768.00) authorized by this amendment.

Sincerely yours,

Harold Kirkemo
Chief, Office of
Minerals Exploration

Enclosure

cc: Director's reading file
Mineral Resources
CMX reading file
Region IV-Robert A. Laurence, USGS
Mr. Robert B. Trace, Geologist USGS
Princeton, Ky.
CMX Docket
Mr. Kirkemo

H Kirkemo/cac 6/13/73

APPLICATION TO EXTEND

OME-HDA EXPLORATION CONTRACT #2306

by

Joseph A. Porter

April 12, 1973

RECEIVED
APR 19 1973
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

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of the Maquoketa shale 3

APPLICATION TO EXTEND

OME-HDA EXPLORATION CONTRACT #2306

by

Joseph A. Porter

Summary: The present contract is approximately 75%-80% completed. An estimated $15,000 will remain when the contract work is completed. Application is made here to extend the present contract by six drill holes costing an estimated $144,000.

General geologic results and interpretation and operational data have been given in previously submitted monthly reports. Results are considered to be moderately successful and rather encouraging. As outlined in the original application, a favorable zone, probably stratigraphic, in a unique geologic environment has been established. The zone has been shown to be identifiable and persistent.

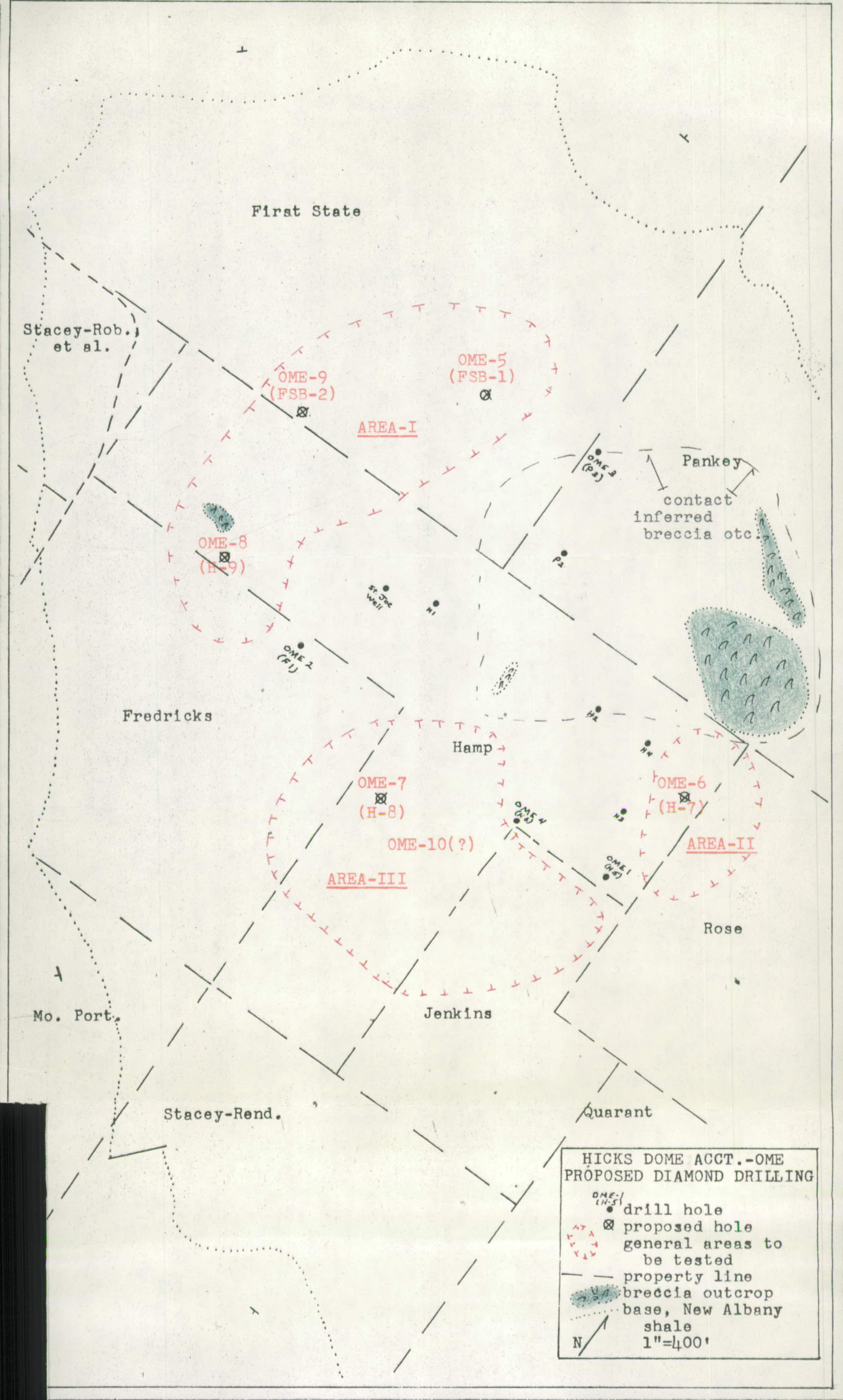
The holes completed are thinly spread over a very large area. Because of the low density of holes the exact form and possible grade of the zone has not been clearly established. Large tonnages are indicated. All of the holes have added to the overall lateral extent of the mineralization. None have tended to limit or restrict the extent. Average grade to date is low.

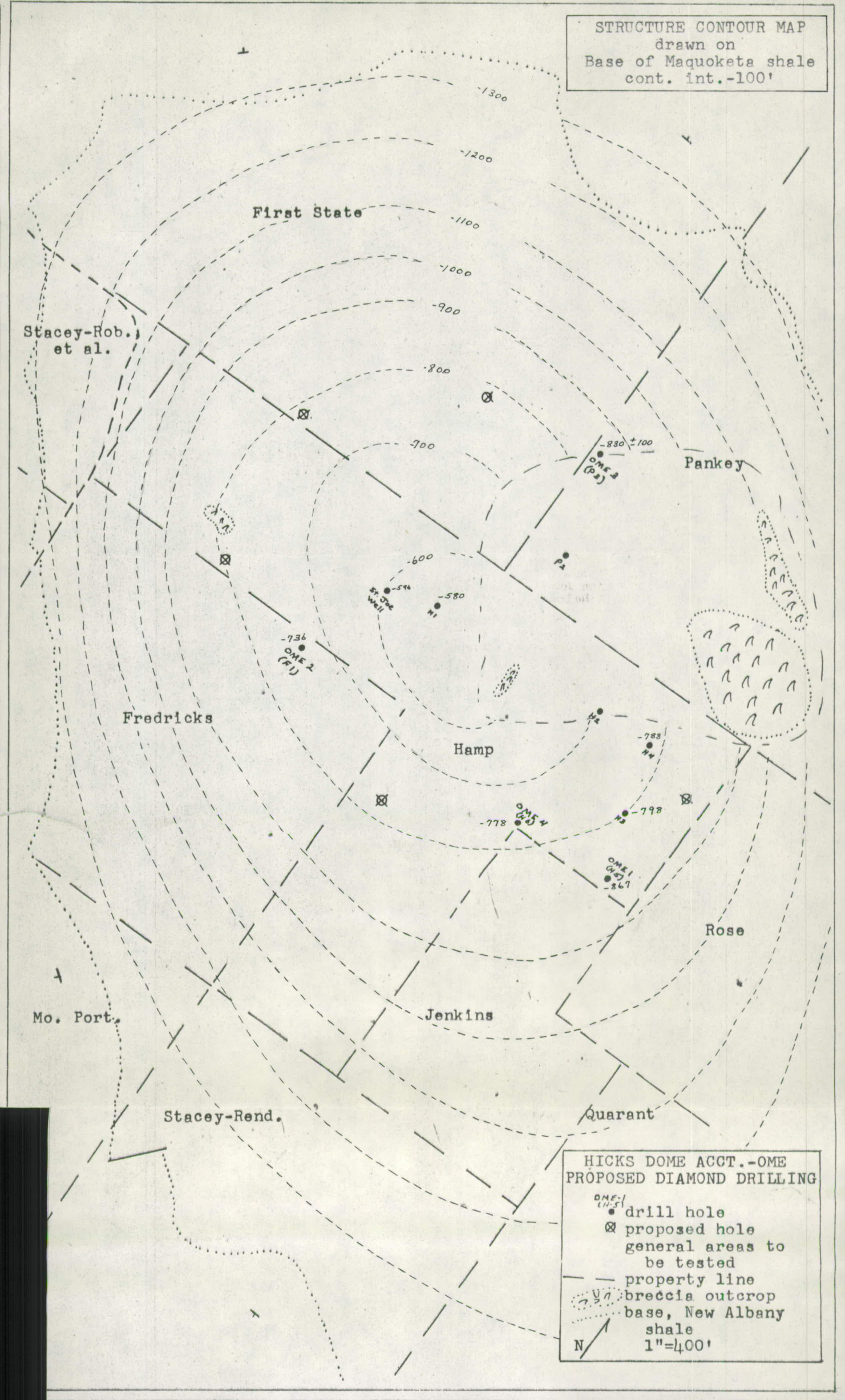
The drilling as proposed should more comprehensively delineate the extent, trend and character of the mineralization. It is possible that as additional data are acquired subsequent holes may be more judiciously located and higher average grade mineralization will be delineated.

The proposed drilling may not be sufficient to complete the project if results continue to be encouraging. Location of holes beyond those cited herein is not presently feasible.

Proposed Drilling: The six proposed holes will be planned to a depth of 2,500 feet. As was the case in the previous drilling, it may be possible to complete them at shallower depths.

The map given on the following pages shows the general areas to be tested, tentative hole locations and previous drilling. Proposed holes are numbered in the probable sequence in which they will be drilled. Also given is a structure contour map drawn on the base of the Maquoketa shale, based on current information.


First State
Stacey-Rob. et al.
OME-9 (FSB-2)
OME-5 (FSB-1)
AREA-I
Pankey
contact inferred breccia etc.
OME-8 (H-9)
Fredricks
Hamp
OME-7 (H-8)
OME-6 (H-7)
OME-10(?)
AREA-II
AREA-III
Rose
Mo. Port.
Jenkins
Stacey-Rend.
Quarant
HICKS DOME ACCT.-OME
PROPOSED DIAMOND DRILLING
drill hole
proposed hole
general areas to be tested
property line
breccia outcrop
base, New Albany shale
N
1"=400'


STRUCTURE CONTOUR MAP
drawn on
Base of Maquoketa shale
cont. int.-100'
-1300
-1200
-1100
-1000
-900
-800
-700
-600
First State
Stacey-Rob.,
et al.
Pankey
Fredricks
Hamp
Rose
Jenkins
Mo. Port.
Stacey-Rend.
Quarant
-830 ±100
OME 3
(P3)
P2
-596
St. Joe
Well
-580
N1
-736
OME 2
(F1)
N2
-783
N4
-778
OME 4
(N3)
N3
-798
OME 1
(N5)
-867
HICKS DOME ACCT.-OME
PROPOSED DIAMOND DRILLING
OME-1
(N-5)
drill hole
proposed hole
general areas to
be tested
property line
breccia outcrop
base, New Albany
shale
1"=400'
N

All locations are tentative. More exact siting will be done when the holes are collared.

1. OME-5. This hole is to be drilled on the northwest flank of the dome in designated Area I. Hole OME-3 intersected recognizable "purple breccia" in or very near the central core or neck of the breccia body. This zone was not recognized in the previously drilled hole P-2, closer to the center of the core. This trend infers that the northwest flank of the dome may be mineralized similar to or better than the southeast flank. Of possible significance is the fact that the beds are probably dipping more steeply on this flank of the dome.

It is presently estimated that this hole will intersect the base of the Maquoketa at approximately the -800' contour. The mineralized zone, if present, should be encountered between hole depth of 1,950' to 2,150'.

Establishing mineralization on the northwest flank would represent a substantial contribution to the tonnage possibilities.

2. OME-6. OME-6 is to be drilled down dip from the intersections in H-3 and H-4 in Area II. This hole should be drilled before efforts are made to extend the known zone to the south and west. This hole should more clearly define the width, test the possible effects of the nearby Pankey breccia and test the effects on grade of pinching down of the breccia body. Another important factor is this hole is in the direction of the Rose mine, the highest grade and best mineralized breccia in the general area.

Depth of hole and position of intersections should be similar to OME-1.

3. OME-7 and OME-10. These holes will be drilled to extend and define the known "purple breccia" in Area III in a south and westerly direction from holes OME-1 and OME-4. It is tentatively located to structurally duplicate Hamp-3.

Regardless of the results of OME-7, one additional hole, tentatively OME-10, should be drilled in the same general area for the same reason.

4. OME-8. This hole is to be drilled in the south part of Area I. The purpose of the hole is to add definition to the mineralization in hole OME-2. If the mineralized zone is encountered in this hole it may serve to greatly extend the zone on the southeast flank or help connect any zone encountered on the northwest flank by OME-5.

This hole should intersect the base of the Maquoketa shale at approximately the -800 foot contour, about 70 feet lower than OME-2.

5. OME-9. This hole is tentatively spotted in Area I but is dependent on the results of OME-5 and OME-8. If both are negative this hole might be better utilized if drilled to help delineate the mineralization on the southeast and south part of the dome.

Another alternative location would be along the northeast flank of the dome in the Pankey breccia, in an attempt to extend the known mineralized zone to the northwest. There is some indication that the Pankey breccia may not persist to depth beneath the apparent outcrop.

Drilling Methods: Most of the drilling problems encountered to date have been the result of cavities and the very hard Grassy Knob chert, both generally occuring at depths of less than 1,000 feet. In an effort to reduce costs and speed up the work an attempt will be made to modify the drilling method. It is proposed that we attempt to do the initial 500 to 1,000 feet of each hole by drilling as far as possible with a combination air or mud rotary and down the hole hammer.

If each hole can be drilled at least 500 feet use of this type of machine should be worthwhile. At this depth there would be reasonable assurance that the hole could be drilled NX size through the Grassy Knob.

The holes will be completed with diamond drilling equipment in a manner similar to that used before. Attempts will be made to keep the hole NX size.

Though bids are not yet in for the rotary work, it is felt that a substantial saving may be effected, particularly if several of the holes can be started at the same time on the same mobilization fee.

Several factors tend to limit the capability of the air rotary-down hole hammer machines. If very heavy ground water is encountered at depth the resulting back pressure makes the hammer ineffective. If drilling rotary with fluids and all are lost, replacement of the fluid may make it too expensive to continue.

Status of Present Contract: The present contract is estimated to be about 80% completed in terms of footage drilled. Expenditures are summarized as follows:

Submitted thru Feb.	$46,469
Estimated March	9,040
Excess bit cost to date	4,500
Estimated to finish OME-4	19,605
Total	$79,614
Budgeted cost of contract	$95,450
Estimated completed cost	79,614
Remaining	$15,836

Costs for Proposed Work: Work being completed on the present contract is based on bids submitted during the early part of 1972. Costs for the extension of the contract will be greater.

Joy Manufacturing, the present contractor has declined to bid on further work. This is because of prior commitments and difficulties encountered on the present job. Other bids are being sought.

Due to general inflationary pressures and poor profit experiences on previous work, I am presently estimating the contract costs to be approximately $20,000 per hole instead of the $18,772 previously estimated. Each hole will cost approximately $24,000 total.

A detailed estimate of all costs based on bids to be received and past experience will be submitted when necessary data are available. A tentative, preliminary breakdown of estimated costs follows:

6 holes X $20,000	=	$120,000
Other costs		22,000
Total		$144,000

Time required to complete the drilling is presently estimated to be eight months.

Respectfully submitted,

Joseph A. Porter
April 12, 1973

United States Department of the Interior

GEOLOGICAL SURVEY
WASHINGTON, D.C. 20242

RECEIVED
APR 13 1973
U. S. Geological Survey
Topographic Division
Knoxville, Tenn.

APR 11 1973

Memorandum

To: Allen V. Heyl, Geologist

From: Harold Kirkemo, Chief, Office of Minerals Exploration

Subject: OME-6873 (Fluorspar, et al.)
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Enclosed are copies of the Operator's Monthly Report for Oct-Dec. 1972, Jan.-Feb. 1973, and accompanying maps, cross sections, and analyses.

This material should bring you up-to-date on the Hicks Dome project. OME - Drill Hole 4 is not yet finished.

In our telephone discussion yesterday concerning amending the contract to allow additional drilling, I neglected to mention that Joe Porter had suggested rotary drilling the upper portions of the new holes. He feels confident that he can predict the depths where we would want core drilling to start, and some cost savings would be possible. I favor this idea but would like opinions from you and Bob before drafting the plan and costs for the amendment.

I hope that you can go to the meeting in Paducah, and can arrange to visit the Hicks Dome project sometime in the last week of April.

As I mentioned to you and Bob yesterday, I would appreciate your views, comments, and recommendations for additional drilling on this project. Porter is submitting very shortly a proposal for about six more holes.

We may have about $58,000 available for obligation on OME contracts by June 30, 1973. If Porter's proposal, after review by you and Bob, has merit, we could obligate most, if not all, of this amount to the Hicks Dome Project.

Harold Kirkemo

Harold Kirkemo

Copy to: Robert A. Trace
U. S. Geological Survey
Princeton, Kentucky 42445

cc: Director's reading file
OME reading file
Mineral Resources
Mr. Laurence R-IV
Mr. Kirkemo
HKirkemo/cac 4/11/73

OME 6873

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey
Branch of Budget and Finance
Washington, D. C. 20242

ADMINISTRATIVE SUSPENSION STATEMENT

Name and Address of Payee: [illegible]
c/o [illegible], Esq.
[illegible] & [illegible]
53 Wall Street
New York, N. Y. 10005

Amount Claimed:	Differences (Explained Below)	Amount Approved
[illegible]	$ 55.56	[illegible]

Bu. Voucher No.	Payee's Invoice No.	Period
	Docket #6873 Contract #2306	Jan. [illegible]

EXPLANATION

Category (7)

Office and Accounting Services
Claimed $ 139.62
Allowed - In order to bring monthly charges to an allowable average of $ 100.00 83.[illegible]
$ 55.56

Any reclaim for items deducted must be included as a separate item on subsequent monthly voucher and supported by the original of this statement.

Branch of Budget and Finance

FORM 9-1648
MARCH 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF MINERALS EXPLORATION

OPERATOR'S MONTHLY VOUCHER For Month of January, 1973

Operator's Name Hicks Dome Account c/o Gilbert Kerlin, Esq.

Address Shearman and Sterling, 53 Wall St. New York, New York 10005

Docket No. OME- OME-6873

Contract 14-08-0001- 2306

Contract Amount 95,450

Gov't. Participation 50 47,725

COST ITEMS (FROM EXHIBIT A)	FOR OPERATOR'S USE: THIS MONTH UNITS	THIS MONTH COSTS $	TO DATE UNITS	TO DATE COSTS $	FOR GOVERNMENT USE ONLY: THIS MONTH UNITS	THIS MONTH COSTS $	TO DATE UNITS	TO DATE COSTS $
Category (1)								
Hrs. Dozing	14	175.00	42	525.00	14	175.00	42	525.00
Rotary Drilling	103'	401.70	725	2,827.50	103	401.70	725	2827.50
Cored, NX 0-500'	89'	391.60	828'	3,643.20	89	391.60	~~842~~ 828	3643.20
500-1000	48'	230.40	639	3,067.20	48	230.40	639	3067.20
1000-1500	-	-	230	1,242.00	—	—	230	1242.00
Cored, BX 0-500'	22'	92.40	22	92.40	22	92.40	22	92.40
500-1000'	273'	1,255.80	409	1,881.40	273	1255.80	409	1881.40
1000-1500'	500'	2,600.00	770	4,004.00	500	2600.00	~~732~~ 770	4004.00
1500-2000'	500'	3,050.00	1000	6,100.00	500	3050.00	1000	6100.00
2000-2500'	200'	1,460.00	526	3,839.80	200	1460.00	526	3839.80
Reaming	101'	303.00	329	987.00	101	303.00	329	987.00
Water Supply, mons.	1	300.00	3.7	1,110.00	1	300.00	3.7	1110.00
Standby time, hrs.	6	84.00	8	112.00	6	84.00	8	112.00
Drilling Mud, bags	45	171.00	79	286.71	45	171.00	79	286.71
Caustic Soda	-	-	1	10.85	—	—	1	10.85
Quebracho	-	-	1	20.78	—	—	1	20.78
Freight & Handling	-	-	21	22.59	—	—	21	22.59
BX Casing lost	120'	300.00	120	320.00	120	300.00	120	300.00
Casing Shoe lost	1	92.60	1	92.60	37.04	92.60	37.04	92.60
Category (2)								
Geologist-Supervisor	1	1,250.00	4	5,000.00	1	1250.00	4	5,000.00
Sampler	2	126.23	4	235.11	2	126.23	3	235.11
Category (3)								
Tons Road Rock	169	273.65	199.9	327.73	169	273.65	199.9	327.73
Core Boxes	231	288.75	511	638.75	231	288.75	511	638.75
Sample Bags	27	9.45	52	16.95	27	9.45	52	16.95
Category (7)								
Office Expense	1	139.02	4	455.56	1	83.46	4	400.00
Trans. of Samples	—	-	25	15.83	—	—	25	15.83
Prepare & Assay CaF_2	19	76.00	44	138.50	19	76.00	44	138.50
Other Assays	-	-	27	35.50	—	—	27	35.50
Spectro. Anal.	—	-	19	171.00	—	—	19	171.00
TOTALS		$13,070.60		$7,199.96		$13,015.04		$37,144.40

I certify that the above bill is correct and just and that payment therefor has not been received.

Date Feb. 6, 1973 *Payee Hicks Dome Account

Per Joseph A. Porter Title Geologist

*When a voucher is signed or receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary," or "Treasurer," as the case may be.

A willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction is a criminal offense. (U. S. Code, Title 18, Sec. 1001.)

(INSTRUCTIONS ON REVERSE)

Approved as noted, subject to field examination and audit.

Signature Harold Kihamo Chief, OME ~~Field Officer~~ Date 3/14/73

(63) 14X0804

Approved for: $ 6,507.52 (SUBJECT TO AUDIT)

Signature BMT

Date 28 MAR 1973 Vou. No. R 3238A

(SEE OTHER SIDE)

FOR OPERATOR'S USE

REMARKS

141090

Category (1)

A total of 120' of casing and a casing shoe was lost in OME-2. A casing shoe was necessary in setting the casing because of caving ground. The shoe is considered a lost casing expense.

Category (2)

Since a small amount was earned by sampler in December payment was deferred till January.

FOR GOVERNMENT USE

REMARKS 1/ Includes approval of 28 ft. of rotary bit (R.B.) drilling from 410' to 438' in Hole 3. Contractor billed at the $3.90/ft. price allowed for the 0-300' depth category for rotary drilling instead of the $4.40/ft. price for core drilling. This resulted in savings to the Government, and R.B enabled completion of hole. Absence of core was not critical to geologic evaluation of the hole.

2/ Allow on per-foot price basis equivalent to BX casing. This device is a steel sleeve threaded to bottom end of casing as cutting head when casing is advanced through broken rock.

3/ Allow $83.46, disallow $55.56 in order to bring charges to date to a monthly allowable average of $100.00.

Harold Kirkham

4/ Allow $300.00. Operator's total in error.

H.K.

OPERATOR'S MONTHLY REPORT

The Operator, under an Office of Minerals Exploration contract, is required to report monthly to the Government. The report consists of two parts.

FIRST, the Operator's Monthly Voucher on Form 9-1648 listing the project costs incurred and claimed by the Operator is the voucher basis for payment of the Government's share of the cost.

SECOND, the Operator's Narrative Report is a concise description of the work performed, results accomplished, and any unusual situations encountered, illustrated and supported by engineering-geological maps or sketches, drill hole logs, assay reports, etc., as pertinent.

The Operator submits the original and three copies of each of the two sections of this report to the OME regional Field Officer at the end of each month during the life of the contract.

PREPARATION OF OPERATOR'S MONTHLY VOUCHER, FORM 9-1648

In the left hand column list the items for which costs were incurred during the month, and also the items for which costs were previously reported. For items previously reported, show only UNITS TO DATE and COSTS TO DATE. Items listed should conform to Exhibit A of the contract (Estimated Costs of the Work). The total of COSTS THIS MONTH followed by the Operator's signature constitutes a claim for payment of the Government's share of the costs. The Operator or his agent must sign the certification in the lower left corner.

Except for amounts claimed under "fixed unit costs" provisions of the contract, all costs claimed in this voucher must be supported by documentary evidence consisting of: (a) certified copies or transcripts of payrolls which list each employee, wage rate, period of employment, gross earnings, and net earnings; (b) original or certified copies of invoices, statements of accounts, or purchase orders which indicate items of materials or services, quantities, unit prices, total charges, and payment terms; and (c) certified memoranda of the Operator for such items as unemployment taxes, employee's liability insurance, and depreciation of Operator-owned equipment. The certification may be stated thus, "Certified True Copy", followed by the signature of the Operator or his agent. One copy of each document should accompany the original of this voucher.

The requirement for submitting documentary evidence of claimed costs may be waived by the OME regional Field Officer if he determines that it is impracticable for an Operator to submit this material. In any case of waiver of this requirement an "on-site" audit by an OME auditor is mandatory prior to payment of the final Operator's Monthly Voucher.

STATEMENT

FROM Larry G. Robinson

Route 1, Herod, Ill.

January 1973

TO Joseph A. Porter (Hicks Dome Account)

ADDRESS Box 447

CITY Rosiclare, Ill.

TERMS Use of D-4 tractor dozing drill site

Jan	19	5½ hrs.	@12	.50	68	75
	20	6 hrs.	@12	50	75	00
	23	2½ hrs.	@12	50	31	25
			TOTAL		175.00	

Larry G. Robinson

Larry G. Robinson

paid ck # 865
2/2/73 - $ 175.00

CERTIFIED TRUE COPY

JOY MANUFACTURING COMPANY

OLIVER BUILDING
PITTSBURGH, PENNSYLVANIA 15222

PLEASE REMIT TO
P. O. BOX 360135M
PITTSBURGH, PA. 15230

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORD'R NO.	DATE	AT REC. POINT	B.O.NO.
CONTRACT	CODE 99 69 05 14 03 209			DATE	AT SHIP POINT	

31180

SOLD TO
Mr. Gilbert Kerlin
53 Wall Street
New York, New York 10005

TERMS NET 30 DAYS
NO CASH DISCOUNT

PLEASE REMIT TO
P.O. BOX 360135M
PITTSBURGH, PA. 15230

INVOICE NO. 05116563

INVOICE DATE 2-7-73

DATE SHIPPED

SHIPPED VIA

SHIPPED TO
Hicks Dome, Illinois

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM Michigan City, Indiana

ORIGINAL QUANTITY ORDERED	PART NUMBER	DESCRIPTION			CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
	To 1,735' core drilling at Hicks Dome, Illinois for period ending January 25, 1973 as per agreement.								
	PROSPECT NO.		FROM	TO		TOTAL FT.	COST	UNIT	TOTAL COST
	F-1 (OME-2)	BX	727.	1000.		273.	4	60	$1,255.80
		BX	1000.	1500.		500.	5	20	2,600.00
		BX	1500.	2000.		500.	6	10	3,050.00
		BX	2000.	2200.		200.	7	30	1,460.00
	H-6 (OME-4)	6¼" R.B.	0.	75.		75.	3	90	292.50
	P-3 (OME-3)	NX	361.	410.		49.	4	40	215.60
		3-7/8" R.B.	410.	438.		28.	3	90	109.20
		NX	438.	478.		40.	4	40	176.00
		BX	478.	500.		22.	4	20	92.40
		NX	500.	548.		48.	4	80	230.40
									$9,481.90
	REAMING								
	P-3 (OME-3)		361.	410.		49.			
			438.	490.		52.			
						101.' @	$3.00/ft.		303.00
	MUD USED UP								
		45 100-lb. bags drilling mud @ $3.80/bag							171.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

4134 4/67
(P133A)

JOY MANUFACTURING COMPANY

PAGE NO. 2

SOLD TO Mr. Gilbert Re[illegible]

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.
				05116503

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
	CORE BOXES USED							
		F-1 (OME-2)	166 Cardboard Core Boxes					
		H-5 (OME-1)	57 Cardboard Core Boxes					
		P-3 (OME-3)	8 Cardboard Core Boxes					
			231 Cardboard Core Boxes @ $1.25/ea.					$ 288.75
	CASING LOST							
		F-1 (OME-2)	120 Feet BX Casing @ $2.50/ft.					300 00
			1 BX Diamond Set Casing Shoe		$185.20			
			Less 50% for usage		92.60			92.60
	FURNISHING WATER							
			Dec. 26 through Jan. 25					
			One (1) month @ $300.00/mo.					300.00
	SURVEY TIME							
		F-1 (OME-2)	Jan. 18 6 hours @ $16.00/hr.					96.00
								$11,033.25

CERTIFIED TRUE COPY

FORM P138A

INVOICE (CONTINUATION)

TRAIN CABOT INC

003952170

EARNINGS	HOURS	AMOUNT	DEDUCTIONS				YEAR TO DATE	
REGULAR		70000	FICA TAX	4095	FED.TAX	10067	GROSS PAY	70000
			STATE TX	1333			FICA	4095
							FED. TAX	10067
							STATE TAX	1333
							FOR PERIOD ENDING	01-15-73
TOTAL EARNINGS		70000	TOTAL DEDUCTIONS			15495	NET PAY	545.05

JOSEPH A PORTER

501 1 020 00044

NON-NEGOTIABLE

5755
1MM 12-71

STATEMENT OF EARNINGS AND DEDUCTIONS

TRAIN CABOT INC

004006690

EARNINGS	HOURS	AMOUNT	DEDUCTIONS				YEAR TO DATE	
REGULAR		70000	FICA TAX	4095	FED.TAX	10067	GROSS PAY	140000
			STATE TX	1333			F.I.C.A.	8190
							FED. TAX	20134
							STATE TAX	2666
							FOR PERIOD ENDING	01-31-73
TOTAL EARNINGS		70000	TOTAL DEDUCTIONS			15495	NET PAY	545.05

JOSEPH A PORTER

501 1 020 00044

NON-NEGOTIABLE

5755
1MM 12-71

STATEMENT OF EARNINGS AND DEDUCTIONS

CERTIFIED TRUE COPY

Joseph A. Porter

February 2, 1973

Mr. Roy A. Stacey
Elizabethtown, Illinois

Dear Sir:

Enclosed is check for $112.27, representing wages earned for 21 hours during December and 32 hours during January. Amount due was calculated as follows:

53 hrs. @ $2.25	$119.25
S.S.	6.98
	$112.27

Thank you.

Sincerely,

Joseph A. Porter

JAP:vb
Enc.

Total Earned	119.25
Social Security	6.98
Total Check	112.23

CERTIFIED TRUE COPY

RECORD OF TIME WORKED

Roy A. Stacey

December 1972

Name, S.S. No., Dependents 2 — Month

351-12-5269

Day - Date	Start Work	Stop Work	Hrs. Worked	Overtime	Remarks
12-14-72			4 hrs		hauled cares from bath rings to home
12-19-72			2 hrs		cares to house
12-21-72			2 hrs		hauled cares to house
12-22-72			4 hrs		" " " home from bath rings
12-28-72			4 hrs		hauled cares to Residence
12-29-72			3 hrs		" " to house
12-30-72			2 hrs		" " " "
		Total	21 hrs		

CERTIFIED TRUE COPY

Joseph A. Porter

Roy A. Stacey

RECORD OF TIME WORKED

Roy A. Stacey

January, 1973

Month

Name, S.S. No., Dependents 2

351-12-5269

Day - Date	Start Work	Stop Work	Hrs. Worked	Overtime	Remarks
1-4-73			4 hrs		hauled cores to Rinehart
1-17-73			4 hrs		" " graded road
1-18-73			2 hrs		" " to home while bulldozer
1-19-73			8 hrs		work, piling pits
1-20-73			8 hrs		moved rig
1-30-73			2 hrs		hauled core to home
1-31-73			4 hrs		hauled cores to Rinehart
		Total	32 hrs		

CERTIFIED TRUE COPY

Roy A. Stacey

Invoice No.

M. L. CONN & SONS

TRUCKING SERVICE

ELIZABETHTOWN, ILLINOIS

From ..... Date 1-27-73, 196

At ..... City ..... County ..... State

Consigned to Joe Porter

Destination ..... Street Rosiclare, Ill. City

County ..... State

DATE	DESCRIPTION	WEIGHT	RATE	TOTAL
	Road Rock to Hicks Dome Road	169.00 Tons	$0.85	$143.65
	Hauling Only	13 Loads	$10/Load	130.00
	Total			$273.65

ck #861 - $273.65
1/30/73

CERTIFIED TRUE COPY

Shipper ..... Glenn Conn Agent

Per ..... Per .....

February 5, 1973

Mrs. Vera Bishop
Elizabethtown
Illinois

Dear Vera:

Enclosed find a check in the amount of $114.22, representing wages earned during the month of January.

77 hrs.	x	$1.80	=	$138.60
S.S.		$8.11		
State I.T.		3.37		
Fed. I. T.		12.90		24.38
				$114.22

Sincerely,

JAP:vb
Encl.

Chg. OMC
70 hrs x $1.80 $126.00
5.8% S.S. 7.30
$133.30

CERTIFIED TRUE COPY

RECORD OF TIME WORKED

Vera Bishop, 178-18-8537 0 January, 1973
Name, S.S. No., Dependents Month

Day - Date	Start Work	Stop Work	Hrs. Worked	Overtime	Remarks
Fri. 12/29/72	11:00	5:00	6		2 hrs Accounting
Sat. 12/30/72	11:30	3:30	4		
Wed. 1/3	11:30	3:30	4		
Thurs. 1/4	11:30	3:30	4		
Fri. 1/5	11:30	3:30	4		
Mon. 1/8	11:30	3:30	4		
Tues. 1/9	11:30	3:30	4		
Wed 1/10	11:30	3:30	4		
Thurs. 1/11	10:30	3:30	5		3 hrs File
Mon. 1/15	10:30	3:30	5		2 hrs File
Tues. 1/16	11:00	3:30	4 ½		
Thurs. 1/18	11:30	3:30	4		
Fri. 1/19	12:00	3:30	3 ½		
Mon. 1/22	11:30	3:30	4		
Tues. 1/23	11:30	3:30	4		
Wed. 1/24	11/30	3:30	4		
Thurs. 1/25	11:00	4:00	5		
Tues. 1/30	11:30	3:30	4		
			77		

CERTIFIED TRUE COPY

January Phone Expenses
Chargeable OME-HDA

Date	Place	Person	Amount
12/20	LaPorte, Ind.	Joy	$2.40
1/3	Princeton, Ky.	Trace	.40
1/5	Washington	Kirkemo	1.00
1/5	LaPorte, Ind.	Joy	1.40
		Total Toll	$5.20
		Tax	.52
			$5.72

CERTIFIED TRUE COPY

Joseph A. Santo

STATEMENT

FROM V.C.McDonald (Chemist)

Rosiclare, Illinois 62982

19

TO Mr. Joe Porter (Geogologist)

ADDRESS Rosiclare, Illinois

CITY Illinois 62982

TERMS

	CORE SAMPLES FOR JANUARY 1973	
1-31-73	56 Determinations @ $1.00 Each	$ 56.00

V.C.McDonald
Chemist

paid ck #864
2/2/73 $56.00

CERTIFIED TRUE COPY

STATEMENT

FROM V.C.McDonald (Chemist)

Rosiclare, Illinois 62982

19

TO Mr. Joe Porter (Geogologist)

ADDRESS Rosiclare, Illinois

CITY Illinois 62982

TERMS

	CORE SAMPLES FOR JANUARY 1973	
1-31-73	56 Determinations @ $1.00 Each	$ 56.00

V.C.McDonald
Chemist

paid- ck # 864
2/2/73 - $56.00

CERTIFIED TRUE COPY

STATEMENT

FROM V.C.McDonald (Chemist)

Rosiclare, Ill.

19

TO Mr. Joe Porter (Geogelogist)

ADDRESS Rosiclare, Ill.

CITY

TERMS

RE: SORE SAMPLES

Sample No.	Date Run	Determinations
946	12-11-72	4
947	"	4
948	17	4
949	20	4
950	27	4
		20

20 Determinations @ $1.00 each $20.00

V.C.McDonald

CERTIFIED TRUE COPY

V.C. McDonald

Joseph A. Porter

OPERATOR'S MONTHLY REPORT

January, 1973

During the month OME-2 was drilled from 878' to a total depth of 2200'. Total footage was 1322'. OME-3 was drilled from 361' to 548', and OME-4 was started and rotary drilled to 75'.

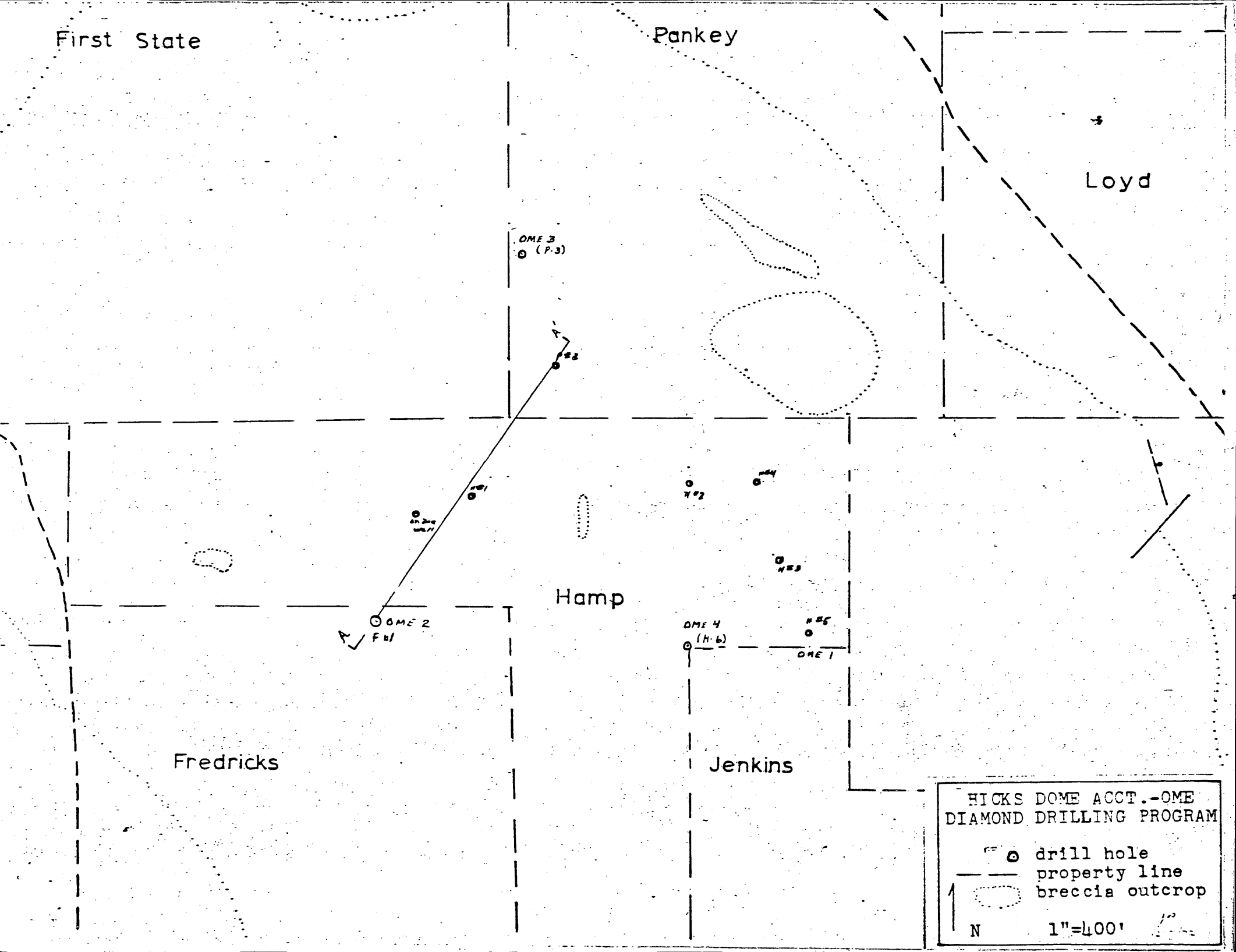
A map showing the location of the subject holes is attached.

OME-2 is considered to have been reasonably successful and encouraging. The main breccia body was intersected at 1812', 490' beneath the base of the Maquoketa, approximately where projected. Fine gray rock flour breccia was encountered from 1928' to 2108'. Below 2108' the breccia was rather coarse and very dolomitic.

A mineralized zone was encountered within the fine breccia. It consisted of 157' of 11.3% CaF_2. This mineralization occurred between 1908' and 2065', 594' and 751' respectively beneath the base of the Maquoketa shale. This zone coincides with the lower part of the Plattin limestone. It correlates very well with the intersections in previous holes.

This mineralized zone had all the characteristics of the zone previously encountered. Fluorite consisted principally of fine grained purple disseminations and replacements in the matrix. Richer portions contained distinct coarse clear barite crystals as is usually encountered. Additionally, it had the fine disseminated yellow sphalerite and galena and spectographic analysis indicated lower but anomolous amounts of other metallics as previously encountered. It differed slightly from the other intersections in that there were increased amounts of coarse crystalline spar in small fractures and patches. Though this feature is usually seen, it was more prominent in this hole.

Though marginal in grade, considerable importance can be attached to this intersection. This occurrence at the same stratigraphic horizon where it was previously encountered offers rather conclusive proof that this is a favored horizon within the breccia mass surrounding Hicks Dome. This intersection also demonstrates that the mineralization is occurring over a very wide area. The nearest previously drilled hole was approximately 1500' to the east.


First State
Pankey
Loyd
OME 3
(P-3)
Hamp
OME 2
F #1
OME 4
(H-6)
OME 1
Fredricks
Jenkins
HICKS DOME ACCT.-OME
DIAMOND DRILLING PROGRAM
drill hole
property line
breccia outcrop
N
1"=400'

Assays cited are those of Skyline. Some McDonald assays are presently in. As was the previous case, McDonald's assays are consistently 1.5% to 2% lower than Skyline.

Attached are:

1. Summary Geologic Log
2. Cross section showing the relationship of OME-2 to the other holes on the southwest limb of Hicks Dome
3. Copies of assay certificates and spectrographic analyses
4. Detailed geologic log of the breccia zone
5. Columnar section and assay graph of the breccia zone.

OME-3 was drilled from 361' to 548'. Substantial difficulties were encountered throughout. Difficulties were due principally to cavities and caving ground. The hole was reduced several times. At 361' the casing was pulled, and the hole was reamed to 410'. It was then drilled with a rock bit from 410' to 438'. The hole was subsequently cored from 438' to 478' where caving ground necessitated reduction to BX. It was then drilled BX to 490', where again caving ground required that all casing be pulled and the hole was reamed with a rock bit to 490'. NX casing was set at 490', and the hole was drilled NX to 548' by the end of the month.

Hole OME-4 was started at the northwest corner of the Jenkins property (Proposed Hole-B). The hole was drilled with a rock bit to a total of 75'. While pulling rods to unplug a stopped up bit, the drill collars and 10' of NX wireline rods were dropped down the hole. The rest of the month was spent in attempting to fish out the collars. These attempts were unsuccessful, and the hole was abandoned. The rig was subsequently moved over 5' and the hole restarted.

Respectfully submitted,

Joseph A. Porter
Geologist
March 2, 1973

SUMMARY LOG
OME-2 (Fredericks Property)

FORMATION	DESCRIPTION	THICK.	DEPTH
Overburden	Cherty residuum	120	120
DEVONIAN			
Clear Creek ls.	Crystalline, light gray and light tan limestone, mostly fine grained, somewhat cherty throughout, few zones very cherty, slightly dolomitic	163	283
Backbone ls.	Light gray, crystalline, fine, medium, some coarse, very pure, stylolitic	40	323
Upper Grassy Knob	Mostly very fine, gray and brownish gray, similar to above in part, somewhat siliceous and argillaceous throughout, few zones fairly cherty, unit contains fairly abundant intrusive dike material and deeply weathered breccia zones	162	485
Lower Grassy Knob	Dark gray, very fine grained, very argillaceous and very cherty, 30% to 60% chert	123	608
Bailey ls.	Very fine grained, very silty and siliceous throughout, gray, somewhat speckled	203	811
SILURIAN			
Moccasin Springs ls.	Extra fine, dense, gray to light gray with streaks and patches of pink and green, wavy argillaceous streaks, disseminated pyrite	103	914

FORMATION	DESCRIPTION	THICK.	DEPTH
St. Clair ls.	Very fine grained, light gray, distinct isolated pink crystals, streaks with abundant pink crystals, stylolitic	31	945
Sexton Creek ls.	Abundant interlaminated, dolomitic, argillaceous streaks, all rather pink and pyritic, few interbedded silty and dolomitic streaks	16	961
Edgewood ls.	Fine grained, dark gray, partly cherty, somewhat nodular in appearance	76	1037
ORDOVICIAN			
Maquoketa shale	Dark gray to black, partly calcareous, fairly hard, bottom part sandy, fairly well fractured throughout	277	1314
Kimmswick ls.	Crystalline, fine, medium, and coarse, rather pure, light gray, stylolitic	68	1382
Decorah-Plattin ls.	Very fine grained, gray, dense, abundant irregular dolomitic argillaceous streaks, slightly silty and dolomitic	41	1423
Breccia and brecciated ls.	Tightly interlocked fragments in a calcareous matrix, traces of fluorite	66	1489
Plattin ls.	Limestone as above	323	1812
Breccia	Fine, medium and coarse, tightly interlocked, fragments of limestone and dolomite in calcite and rock flour matrix, very little matrix material, traces of fluorite, pyritic throughout	65	1877

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St. Clair ls.	Very fine grained, light gray, distinct isolated pink crystals, streaks with abundant pink crystals, stylolitic	31	945
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Plattin ls.	Limestone as above	323	1812
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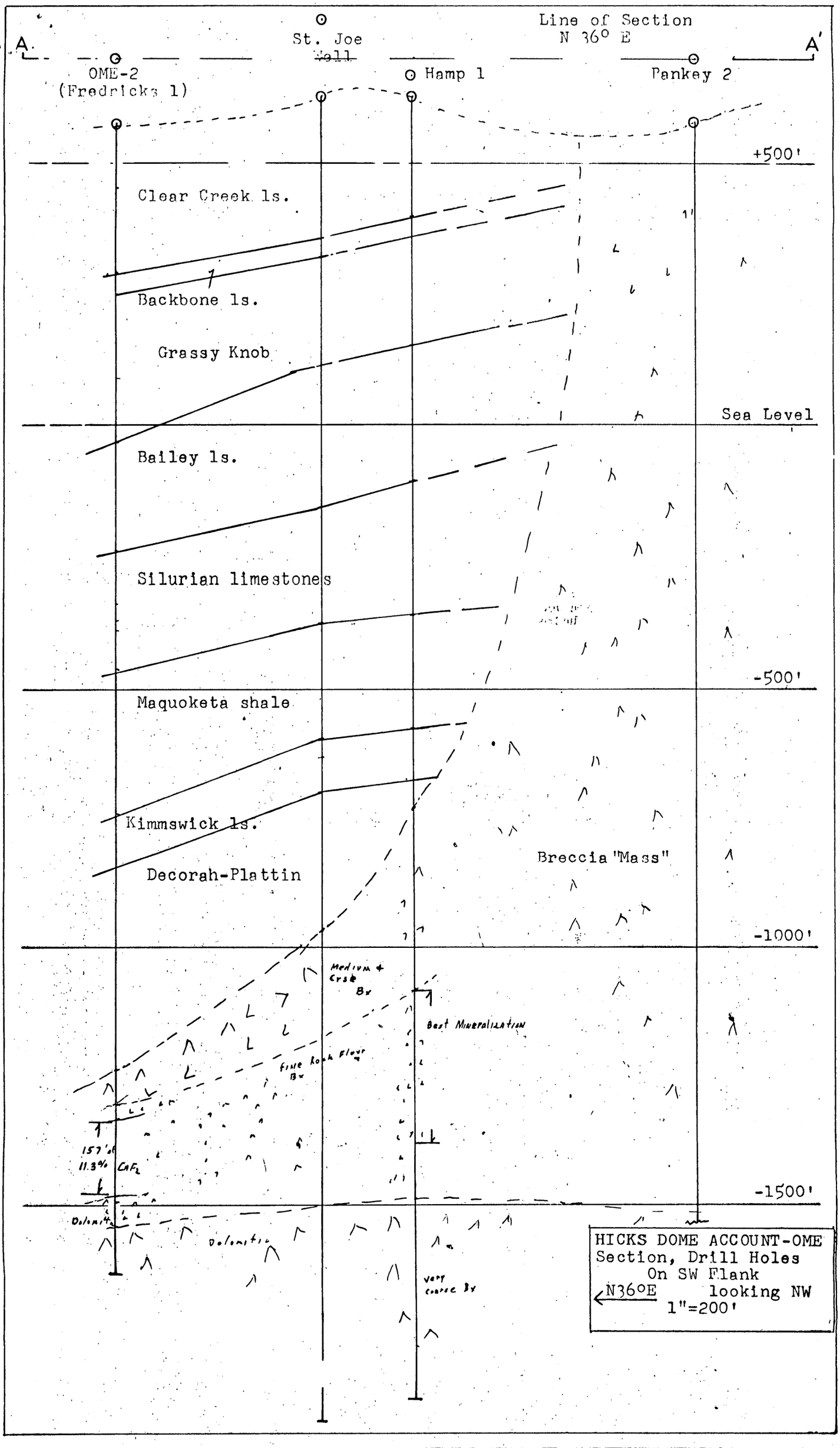
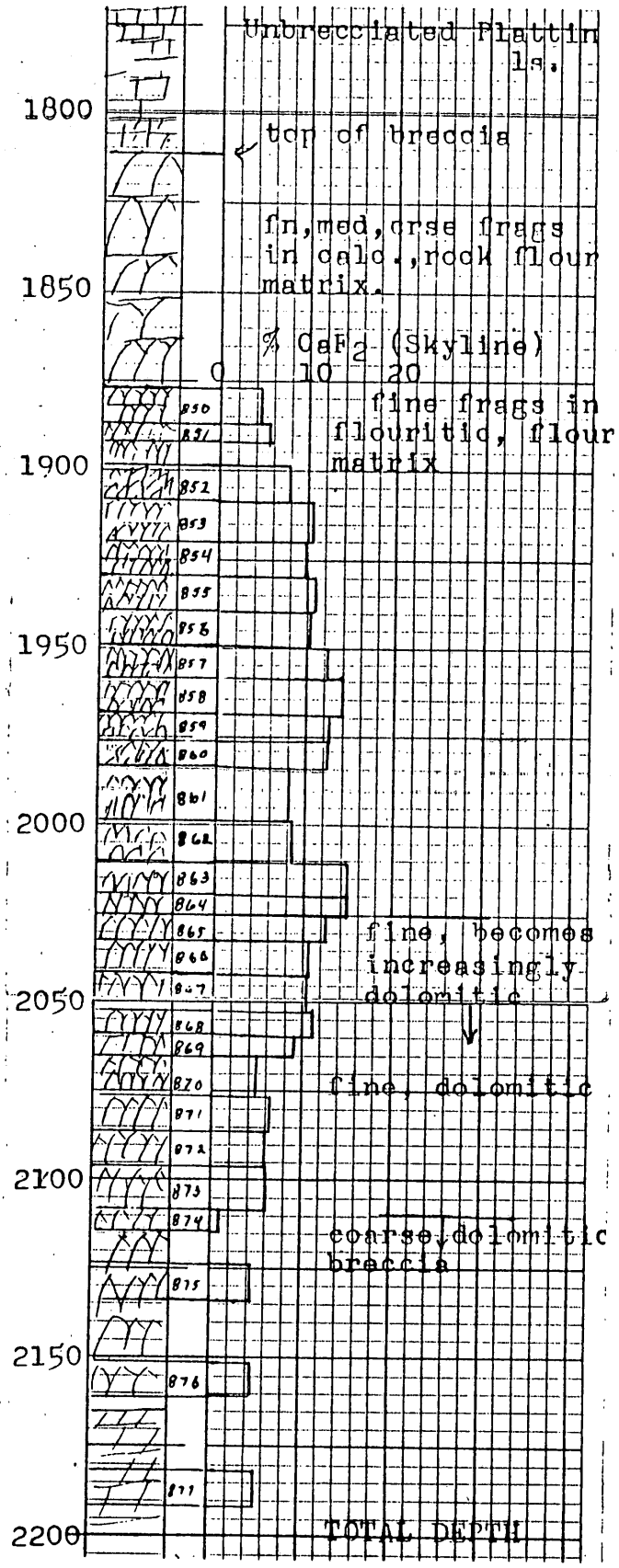

Line of Section
N 36° E
A
A'
St. Joe
Well
OME-2
(Fredricks 1)
Hamp 1
Pankey 2
+500'
Clear Creek ls.
Backbone ls.
Grassy Knob
Sea Level
Bailey ls.
Silurian limestones
-500'
Maquoketa shale
Kimmswick ls.
Decorah-Plattin
Breccia "Mass"
-1000'
Medium + Crse Bx
Best Mineralization
Fine Rock Flour Bx
157' of 11.3% CaF2
-1500'
Dolomite
Dolomite
Very Coarse Bx
HICKS DOME ACCOUNT-OME
Section, Drill Holes
On SW Flank
N36°E
looking NW
1"=200'

COLUMNAR SECTION & ASSAY GRAPH
BRECCIA ZONE
OME-2 (FREDRICKS #1)



Vertical 1"=50'
Assay 1"=20% CaF_2

SKYLINE LABS, INC.
SPECIALISTS IN EXPLORATION GEOCHEMISTRY
12090 WEST 50TH PLACE • WHEAT RIDGE, COLORADO 80033 • TEL.: (303) 424-7718

REPORT OF ANALYSIS

Job No. M-1799
February 12, 1973

Mr. Joseph A. Porter
P.O. Box 447
Rosiclare, Illinois 62982

Analysis of 29 Rock Chip Samples DIAMOND DRILL HOLE - Fredericks 1 (OME-2)

Item	Sample No.	CaF_2 (%)	Item	Sample No.	CaF_2 (%)
1.	850	4.4	16.	865	12.5
2.	851	5.5	17.	866	10.5
3.	852	7.8	18.	867	10.5
4.	853	10.5	19.	868	11.
5.	854	9.9	20.	869	8.8
6.	855	11.	21.	870	4.9
7.	856	10.5	22.	871	6.2
8.	857	12.5	23.	872	6.0
9.	858	14.	24.	873	6.0
10.	859	12.5	25.	874	1.2
11.	860	12.5	26.	875	4.5
12.	861	8.2	27.	876	4.5
13.	862	8.6	28.	877	5.1
14.	863	14.5	29.	878	6.6
15.	864	14.5			

Charles E. Thompson
Chief Chemist

CC: John L. Carroll

SKYLINE LABS, INC.
SPECIALISTS IN EXPLORATION GEOCHEMISTRY
12090 WEST 50TH PLACE • WHEAT RIDGE, COLORADO 80033 • TEL.: (303) 424-7718

REPORT OF SPECTROGRAPHIC ANALYSIS

Job No. M-1799
February 12, 1973

Mr. Joseph A. Porter
P.O. Box 447
Rosiclare, Illinois 62982

DIAMOND DRILL HOLE F-1 (OME-2)

Values reported in parts per million except where noted otherwise, to the nearest number in the series 1, 1.5, 2, 3, 5, 7 etc.

Element	Sample Number 853	854	860	862	863	864	865
Fe	2%	3%	1.5%	2%	2%	2%	2%
Ca	20%	20%	20%	20%	10%	7%	10%
Mg	3%	3%	2%	2%	2%	2%	3%
Ag	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500	<500
B	20	20	30	20	50	30	30
Ba	>10,000	10,000	10,000	5,000	>10,000	>10,000	10,000
Be	200	200	500	200	300	300	500
Bi	15	15	15	10	20	20	10
Cd	<50	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5	<5	<5
Cr	30	300	30	50	50	50	30
Cu	15	10	10	7	15	10	10
Ga	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20
La	200	200	200	200	200	200	200
Mn	700	700	700	500	1,000	700	700
Mo	2	<2	2	<2	2	<2	2
Nb	700	500	700	300	500	700	700
Ni	10	100	10	10	15	15	10
Pb	700	500	300	300	300	500	300
Sb	<100	<100	<100	<100	<100	<100	<100
Sc	200	200	200	150	300	300	200
Sn	<10	<10	<10	<10	<10	<10	<10
Sr	7,000	10,000	5,000	5,000	3,000	3,000	5,000
Ti	5,000	3,000	3,000	3,000	5,000	5,000	3,000
V	300	100	300	150	150	200	200
W	70	<50	50	<50	50	50	50
Y	2,000	1,500	1,500	1,000	3,000	2,000	1,000
Zn	300	300	200	<200	300	500	200
Zr	200	150	150	100	200	150	100

Element	Sample Number 866	869	870	873	877	878
Fe	1%	1%	1%	1%	.7%	2%
Ca	10%	7%	7%	15%	15%	5%
Mg	3%	3%	5%	7%	5%	1.5%
Ag	<1	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500
B	30	20	15	15	15	50
Ba	10,000	7,000	2,000	5,000	1,000	70
Be	300	300	200	300	30	10
Bi	15	15	<10	10	<10	<10
Cd	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5	30
Cr	20	20	15	20	10	150
Cu	10	10	5	5	2	70
Ga	<10	<10	<10	<10	<10	30
Ge	<20	<20	<20	<20	<20	<20
La	200	200	50	100	<20	500
Mn	700	700	700	700	700	1,000
Mo	<2	<2	2	2	2	2
Nb	700	500	200	500	70	100
Ni	7	7	5	5	5	70
Pb	500	500	300	20	10	70
Sb	<100	<100	<100	<100	<100	<100
Sc	200	100	20	50	30	20
Sn	<10	<10	<10	<10	<10	<10
Sr	1,500	1,500	1,000	2,000	500	1,500
Ti	3,000	3,000	1,500	2,000	1,000	7,000
V	150	150	100	100	100	100
W	50	50	<50	50	<50	50
Y	1,500	1,500	200	700	150	100
Zn	500	<200	<200	<200	<200	<200
Zr	100	150	30	100	30	300

Charles E. Thompson
Charles E. Thompson
Chief Chemist

CC: John L. Carroll

Comparison and Summary
Skyline and McDonald Assays
Hole OME-1

Sample	McDonald		Skyline
	$BaSO_4$	CaF_2	CaF_2
944	5.60	6.41	8.6
945	5.18	6.76	9.4
946	4.12	5.26	8.6
947	7.40	19.19	18.5
948	2.20	7.07	9.9
949	3.70	13.55	16.0
950	2.60	10.96	12.5
951	2.00	6.45	8.6
952	3.00	8.25	11.0
953	4.40	9.00	14.5
954	3.12	7.00	9.4
955	1.60	13.40	17.5
956	4.26	14.68	18.0
957	1.54	2.55	5.3

RECEIVED
MAR 29 1973
S. Geological Survey
ogic Division
Knoxville, Tenn.

Mr. Joseph A. Porter
Geologist
Box 447
Rosiclare, Illinois 62982

Re: OME-6873 (Fluorspar, et al.)
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois
Contract 2306

Dear Mr. Porter:

Enclosed is a copy of the front and back sides of the voucher for January 1973 as I have approved it for transmittal to the Branch of Financial Management for processing.

As you see the total disallowance from your claim is only $55.56, and that is for Office Expense. I have justified in the Remarks the other claims we discussed by phone on March 13. Hopefully, these will be acceptable to the Branch of Financial Management, and the voucher approved for payment as submitted.

I hope this will be useful to you in preparing the voucher for February.

Sincerely yours,

Harold Kirkemo
Chief, Office of
Minerals Exploration

Enclosures

cc: Director's reading file
Mineral Resources
OME reading file
Region IV
Mr. Kirkemo

HKirkemo/cac 3/14/73

RECEIVED
MAR 19 1973
Geological Survey
Div.
le, Tenn.

RECEIVED
FEB 7 - 1973
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

Operator's Monthly Report

December, 1972

During the month Hole OME-1 was completed to a depth of 2326', OME-2 was advanced from 215' to 878' and OME-3 was started and rotary drilled to a depth of 361'.

Geology of OME-1 was discussed in the previous reports. First assay results have been received from Skyline Labs and are attached. Assay indicates grade of the "purple breccia" zone to be somewhat less than previously encountered. The entire 87' zone averages 13.1% CaF_2. Spectrographic analysis indicates anomolous amounts of niobium, yttrium, and berylium, but again, they are lower than previously encountered. Copies of assay data and spectrographic analysis are attached.

Some check assays have been received from McDonald, a local assayer. His CaF_2 assays are consistently lower than those of Skyline. A summary of McDonald assays, which have been received verbally, is attached to the Skyline certificates. Additional check assays will be required.

Hole OME-2 was plagued with mechanical problems for the first part of the month. Part of the lack of progress was due to the very hard, cherty Grassy Knob which was encountered at 323.0. A cavity was intersected from 427.0 to 437.0. Chert gravel coming into the hole from this cavity was causing loss of progress and excessive bit wear and diamond loss. Efforts to continue with NX size were stopped at 591' and the hole was reduced to BX.

Diamond loss in the above cited zones will probably be high. There may be some diamond costs in excess of $1.00 per foot which will be for our account. This will be determined after the salvage reports are returned and the total costs are received for the entire hole.

Stratigraphy encountered to date in OME-2 is a normal Devonian sequence. A summary log will be submitted when more data are available. It is possible that this hole is encountering more intrusive material than seen in OME-1. The rock is possibly somewhat more fractured.

Hole OME-3 is located 600 feet north, 30 feet east of the SW corner of the Pankey-Antaeus property. It was started on December 11. Drilling was principally on only one shift. Problems were encountered on reaching solid rock. Casing was set at 361' and was drilled NX to 398'. A cavity was encountered from 378' to 410'. The hole was then drilled to 438' with a 3 7/8" rock bit and NX casing was set at the end of the month. As of this writing, they are still experiencing extreme difficulty due to loose, broken Grassy Knob chert.

Respectfully submitted,

Joseph A. Porter

Joseph A. Porter
January 11, 1973

SKYLINE LABS, INC.
SPECIALISTS IN EXPLORATION GEOCHEMISTRY
12090 WEST 50TH PLACE • WHEAT RIDGE, COLORADO 80033 • TEL.: (303) 424-7718

REPORT OF ANALYSIS

Job No. M-1751
December 26, 1972

Mr. Joseph Porter
P.O. Box 506
Rosiclare, Illinois 62982

Analysis of 25 Crushed Drill Core Samples

Item	Sample No.	CaF_2 (%)	Zn (ppm)	Pb (ppm)	Au (ppm)	Ag (ppm)	Cu (ppm)
1.	933	.33	35	*	*	*	*
2.	934	.23	30	215,000	<.02	32	2,650
3.	935	.49	10	*	*	*	*
4.	936	4.5	115	*	*	*	*
5.	937	7.2	280	*	*	*	*
6.	938	8.2	300	*	*	*	*
7.	939	6.8	1,000	*	*	*	*
8.	940	9.4	580	*	*	*	*
9.	941	7.0	680	*	*	*	*
10.	942	7.8	810	*	*	*	*
11.	943	10.5	440	*	*	*	*
12.	944	8.6	695	*	*	*	*
13.	945	9.4	550	*	*	*	*
14.	946	8.6	1,700	*	*	*	*
15.	947	18.5	50	850	*	*	*
16.	948	9.9	45	900	*	*	*
17.	949	16.	35	850	*	*	*
18.	950	12.5	40	800	*	*	*
19.	951	8.6	45	600	*	*	*
20.	952	11.	35	800	*	*	*
21.	953	14.5	30	950	*	*	*
22.	954	9.4	40	900	*	*	*
23.	955	17.5	40	1,100	*	*	*
24.	956	18.	40	550	*	*	*
25.	957	5.3	35	200	*	*	*

for Charles E. Thompson
Chief Chemist

* Analysis not requested

CC: John L. Carroll

SKYLINE LABS, INC.
SPECIALISTS IN EXPLORATION GEOCHEMISTRY
12090 WEST 50TH PLACE • WHEAT RIDGE, COLORADO 80033 • TEL.: (303) 424-7718

REPORT OF SPECTROGRAPHIC ANALYSIS

Job No. M-1751
December 26, 1972

Mr. Joseph Porter
P.O. Box 506
Rosiclare, Illinois 62982

Values reported in parts per million except where noted otherwise, to the nearest number in the series 1, 1.5, 2, 3, 5, 7 etc.

Element	Sample Number 933	934	935	936	939	941	943	946	947
Fe	3%	5%	.2%	.5%	.7%	.7%	2%	2%	1%
Ca	3%	5%	>20%	7%	10%	20%	20%	7%	7%
Mg	.2%	2%	.5%	.3%	1%	1%	1%	1.5%	3%
Ag	<1	50	<1	<1	<1	<1	<1	<1	<1
As	<500	500	<500	<500	<500	<500	<500	<500	<500
B	<10	10	<10	10	10	10	15	20	15
Ba	200	200	500	2,000	5,000	7,000	7,000	10,000	>10,000
Be	5	3	30	100	100	150	200	500	500
Bi	<10	<10	<10	<10	10	10	10	15	10
Cd	<50	<50	<50	<50	<50	<50	<50	<50	<50
Co	10	<5	<5	<5	<5	<5	<5	<5	<5
Cr	50	<10	<10	10	10	10	20	15	10
Cu	15	2,000	5	5	3	5	5	10	10
Ga	20	<10	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20	<20
La	50	<20	70	<20	<20	<20	100	<20	20
Mn	300	200	150	100	300	300	500	500	700
Mo	<2	<2	<2	<2	2	2	<2	<2	<2
Nb	50	70	50	200	300	500	500	1,000	700
Ni	30	<5	<5	<5	<5	<5	5	10	5
Pb	200	>10,000	700	500	700	1,000	500	1,000	500
Sb	<100	200	<100	<100	<100	<100	<100	<100	<100
Sc	10	10	<10	50	150	200	100	150	70
Sn	<10	<10	30	<10	<10	<10	<10	<10	<10
Sr	300	70	1,000	1,500	2,000	2,000	2,000	2,000	2,000
Ti	3,000	500	500	1,500	2,000	3,000	3,000	5,000	3,000
V	200	70	30	100	200	200	200	300	200
W	<50	<50	<50	<50	<50	<50	<50	<50	<50
Y	150	50	70	300	1,000	1,500	1,000	2,000	2,000
Zn	<200	<200	<200	<200	1,000	<200	<200	1,500	<200
Zr	100	20	20	50	150	200	200	200	200

Element	Sample Number 948	949	950	951	952	953	954	955	956	957
Fe	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Ca	7%	15%	10%	7%	10%	7%	7%	7%	20%	10%
Mg	2%	3%	3%	3%	2%	2%	3%	3%	5%	5%
Ag	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
B	10	10	10	10	10	10	10	10	10	10
Ba	10,000	>10,000	>10,000	>10,000	>10,000	>10,000	>10,000	>10,000	>10,000	10,000
Be	300	200	200	100	200	500	200	150	200	50
Bi	10	10	10	10	10	10	10	10	10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Cr	10	10	10	10	10	10	10	10	20	10
Cu	20	7	7	7	7	7	10	7	5	3
Ga	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
La	20	<20	20	50	<20	20	20	100	100	100
Mn	500	500	500	700	500	500	700	700	700	700
Mo	<2	<2	2	2	2	<2	2	2	<2	<2
Nb	700	500	700	300	1,000	700	500	300	300	100
Ni	5	<5	<5	<5	<5	5	5	<5	5	<5
Pb	1,000	700	500	500	500	700	1,000	1,000	500	150
Sb	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Sc	100	70	50	50	70	70	50	30	20	10
Sn	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Sr	2,000	2,000	2,000	1,500	1,500	1,500	1,500	2,000	1,500	700
Ti	3,000	2,000	2,000	1,500	3,000	3,000	2,000	1,500	1,500	1,500
V	200	200	200	150	200	200	200	100	100	100
W	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Y	1,500	1,000	700	500	1,000	1,000	700	500	500	100
Zn	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Zr	200	100	100	100	200	150	100	100	100	50

for Edwin O. Pick
Charles E. Thompson
Chief Chemist

CC: John L. Carroll

Comparison and Summary
Skyline and McDonald Assays
Hole OME-1

Sample	McDonald		Skyline
	$BaSO_4$	CaF_2	CaF_2
944	5.60	6.41	8.6
945	5.18	6.76	9.4
946	4.12	5.26	8.6
947	7.40	19.19	18.5
948	2.20	7.07	9.9
949	3.70	13.55	16.0
950	2.60	10.96	12.5
951	2.00	6.45	8.6
952	3.00	8.25	11.0
953	4.40	9.00	14.5
954	3.12	7.00	9.4
955	1.60	13.40	17.5
956	4.26	14.68	18.0
957	1.54	2.55	5.3

FORM 9-1648
MARCH 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF MINERALS EXPLORATION

Extra Copy

OPERATOR'S MONTHLY VOUCHER For Month of December, 1972

Operator's Name Hicks Dome Account c/o Gilbert Kerlin, Esq.

Address Shearman and Sterling, 53 Wall St. New York, New York 10005

Docket No. OME- OME-6873
Contract 14-08-0001 2306
Contract Amount $95,450
Gov't. Participation % 50 $ 47,725

COST ITEMS (FROM EXHIBIT A)	FOR OPERATOR'S USE: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS	FOR GOVERNMENT USE ONLY: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS
		$		$		$		$
Category (1)								
Hrs Dozing	9	112.50	28	350.00	9	112.50	28	350.00
Rotary Drilling	361'	1407.90	622'	2,425.80	361 ft	1,407.90	622	2,425.80
Cored, NX 0'-500'	285'	1254.00	739'	3,251.60	285 ft	1,254.00	739	3,251.60
500-1000	91'	436.80	591'	2,836.80	91 ft	436.80	591	2,836.80
1000-1500	-	-	230'	1,242.00	—	—	230	1,242.00
Cored, BX 500-1000	136'	625.60	136'	625.60	136 ft	625.60	136	625.60
1000-1500	-	-	270'	1,404.00	—	—	270	1,404.00
1500-2000	-	-	500'	3,050.00	—	—	500	3,050.00
2000-2500	62'	452.60	326'	2,379.80	62 ft	452.60	326	2,379.80
Reaming	-	-	228'	684.00	—	—	228	684.00
Water Supply, mons.	1	300.00	2.7	810.00	1 mo	300.00	2.7	810.00
Standby time, hrs.	2	28.00	2	28.00	2 hr	28.00	2	28.00
Drilling Mud, bags	15	57.00	34	115.71	15 bgs	57.00	36	169.93
Caustic Soda	-	-	1	10.85				
Quebracho	-	-	1	20.78				
Freight & Handling	-	-	21	22.59				
Category (2)								
Geologist-Supervisor	1	1250.00	3	3,750.00	1 mo	1,250.00	3	3,750.00
Sampler	-	-	2	108.88	—	—	1	108.88
Category (3)								
T., Coarse Rock	-	-	30.9	54.08	—	—	30.9	54.08
Core Boxes	57	71.25	280	350.00	57 bx	71.25	280	350.00
Sample Bags	25	7.50	25	7.50	25 bg	7.50	25	7.50
Category (7)								
Office Expense	1	133.50	3	316.54	1 mo	133.50	3	316.54
Trans. of Samples	25	15.83	25	15.83	25	15.83	25	15.83
Prepare, Assay BaF2	25	62.50	25	62.50	25	62.50	25	62.50
Other assays, metals	27	35.50	27	35.50	27	35.50	27	35.50
Spectrographic Anal.	19	171.00	19	171.00	19	171.00	19	171.00
TOTALS		$ 6,421.48		$ 24,129.36		$ 6,421.48		$ 24,129.36

I certify that the above bill is correct and just and that payment therefor has not been received.

Date Jan. 10, 1973 *Payee Hicks Dome Account

Per Joseph A. Porter Title Geologist

*When a voucher is signed or receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary," or "Treasurer," as the case may be.

A willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction is a criminal offense. (U. S. Code, Title 18, Sec. 1001.)

(INSTRUCTIONS ON REVERSE)

Approved as noted, subject to field examination and audit.

Signature Robert A. Weeks Asst Chief OME ~~Field Officer~~ Date 1-29-73

Approved for: $ 3210.74 (SUBJECT TO AUDIT)

Signature BMF

Date Jan 31 1973 Vou. No. 03890A

(SEE OTHER SIDE)

FOR OPERATOR'S USE

REMARKS

Category (1)

Two hours rig time at $16.00 were charged for tropari surveying of ~~B-5~~. OME It is charged here as standby time at $14.00.

Freight and handling of the drilling mud was included in the charge per bag.

Category (2)

Some time was worked by the part time sampler but was not turned in. It will be included in the January time.

Category (3)

We still have not received and invoice for most of the road rock used. The supplier was contacted but as yet no bill has been received.

Category (7)

Office expense is made up of $109.73 for secretarial and $23.77 for telephone. Bills for copy work are pending.

FOR GOVERNMENT USE

REMARKS

I/ allow tropari survey as standby time, at $14.00/hr.

Raw
1-29-73

RECEIVED
U.S. GEOLOGICAL SURVEY
JAN 29 3 17 PM '73
BUDGET & FINANCE

104104

OPERATOR'S MONTHLY REPORT

The Operator, under an Office of Minerals Exploration contract, is required to report monthly to the Government. The report consists of two parts.

FIRST, the Operator's Monthly Voucher on Form 9-1648 listing the project costs incurred and claimed by the Operator is the voucher basis for payment of the Government's share of the cost.

SECOND, the Operator's Narrative Report is a concise description of the work performed, results accomplished, and any unusual situations encountered, illustrated and supported by engineering-geological maps or sketches, drill hole logs, assay reports, etc., as pertinent.

The Operator submits the original and three copies of each of the two sections of this report to the OME regional Field Officer at the end of each month during the life of the contract.

PREPARATION OF OPERATOR'S MONTHLY VOUCHER, FORM 9-1648

In the left hand column list the items for which costs were incurred during the month, and also the items for which costs were previously reported. For items previously reported, show only UNITS TO DATE and COSTS TO DATE. Items listed should conform to Exhibit A of the contract (Estimated Costs of the Work). The total of COSTS THIS MONTH followed by the Operator's signature constitutes a claim for payment of the Government's share of the costs. The Operator or his agent must sign the certification in the lower left corner.

Except for amounts claimed under "fixed unit costs" provisions of the contract, all costs claimed in this voucher must be supported by documentary evidence consisting of: (a) certified copies or transcripts of payrolls which list each employee, wage rate, period of employment, gross earnings, and net earnings; (b) original or certified copies of invoices, statements of accounts, or purchase orders which indicate items of materials or services, quantities, unit prices, total charges, and payment terms; and (c) certified memoranda of the Operator for such items as unemployment taxes, employee's liability insurance, and depreciation of Operator-owned equipment. The certification may be stated thus, "Certified True Copy", followed by the signature of the Operator or his agent. One copy of each document should accompany the original of this voucher.

The requirement for submitting documentary evidence of claimed costs may be waived by the OME regional Field Officer if he determines that it is impracticable for an Operator to submit this material. In any case of waiver of this requirement an "on-site" audit by an OME auditor is mandatory prior to payment of the final Operator's Monthly Voucher.

STATEMENT

FROM Larry Robinson

FOR Use of D-4 tractor dozing drill site and moving equipment

DATE December 1972

TO Hicks Dome Account c/o Joseph A. Porter

STREET Box 447

CITY Rosiclare, Illinois

9 hrs. @$12.50/hr.	$112.50
Total	$112.50

Ck #856
$112.50
1/10/73

Larry Robinson
Larry Robimson

CERTIFIED TRUE COPY

for a Porter

JOY MANUFACTURING COMPANY

OLIVER BUILDING
PITTSBURGH, PENNSYLVANIA 15222

PLEASE REMIT TO
P. O. BOX 360135M
PITTSBURGH, PA. 15230

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORD'R NO.	DATE	AT REC. POINT	B.O.NO.
CONTRACT	CODE 99 69 05 14 02 209			DATE	AT SHIP POINT	

31:80

SOLD TO
Mr. Gilbert Kaplin
53 Wall Street
New York, New York 10005

TERMS NET 30 DAYS
NO CASH DISCOUNT

INVOICE NO. 05116501

INVOICE DATE 1-10-73

PLEASE REMIT TO
P.O. BOX 360135M
PITTSBURGH, PA. 15230

DATE SHIPPED

SHIPPED TO
Hicks Dome, Illinois

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM Michigan City, Indiana

ORIGINAL QUANTITY ORDERED	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 935' core drilling at Hicks Dome, Illinois for period ending December 25, 1972 as per agreement.					
		PROSPECT NO. FROM TO		TOTAL FT.	COST	UNIT	TOTAL COST
		H-5 (OME-1) BX 2264. 2326.		62.	7.30		$ 452.60
		P-3 (OME-3) Rotary 0. 361.		361.	3.90		1,407.90
		F-1 (OME-2) NX 215. 500.		285.	4.40		1,254.00
		NX 500. 591.		91.	4.80		436.80
		B BX 591. 727.		136.	4.60		625.60
							$4,176.90
		MUD USED UP					
		15 100-lb. bags drilling mud @ $3.80/bag					57.00
		CORE BOXES USED					
		57 Cardboard Core Boxes @ $1.25/ea.					71.25
		FURNISHING WATER					
		Nov. 26 through Dec. 25, 1972.					
		One (1) month @ $300.00/mo.					300.00

CERTIFIED TRUE COPY

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

4133-6 4/67
4134-SINGLE 4/67

09007

FORM

JOY MANUFACTURING COMPANY

PAGE NO. 2

SOLD TO Mr. Gilbert Kerlin

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.
				05116501

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
	TRO	PART SURVEYS						
		H-5 (OME-1)	Dec. 7 2 hours @ $16.00/hr.					$ 32.00
								$4,637.15

FORM P138A

INVOICE (CONTINUATION)

TRAIN CABOT INC 003855808

EARNINGS	HOURS	AMOUNT	DEDUCTIONS			
REGULAR		70000	FED.TAX	10067	STATE TX	1333
TOTAL EARNINGS		70000	TOTAL DEDUCTIONS			11400

YEAR TO DATE	
GROSS PAY	1535000
F.I.C.A.	46800
FED. TAX	213541
STATE TAX	28789

FOR PERIOD ENDING 12-15-72

NET PAY 586.00

JOSEPH A PORTER 501 1 020 00044 NON-NEGOTIABLE

5755
1MM 12-71

STATEMENT OF EARNINGS AND DEDUCTIONS

TRAIN CABOT INC 003903237

EARNINGS	HOURS	AMOUNT	DEDUCTIONS			
REGULAR		70000	FED.TAX	10067	STATE TX	1333
TOTAL EARNINGS		70000	TOTAL DEDUCTIONS			11400

YEAR TO DATE	
GROSS PAY	1605000
F.I.C.A.	46800
FED. TAX	223608
STATE TAX	30122

FOR PERIOD ENDING 12-31-72

NET PAY 586.00

CERTIFIED TRUE COPY

JOSEPH A PORTER 501 1 020 00044 NON-NEGOTIABLE

5755
1MM 12-71

STATEMENT OF EARNINGS AND DEDUCTIONS

AES-19 (10-65)
Printed in U.S.A.

AIR EXPRESS
division of REA EXPRESS

Destination Office: Wheat Ridge, Colorado	Via Final Airport: Den	Date Shipped: ____196__	Hour: A.M. / P.M.
Consignee: 12090 W. 50th Place		Receipt Number: A E 25 63 23	
Street Address: Skyline Labs mr. Chas. Thompson	Declared Value: $		
Forwarding Office: HERRIN, ILL.	Code No.: 12324 / 1st Arpt.: / RZ No.: 272		

Pieces	Article	Nature of Contents	Actual Weight	SCALE NOS.
1	Ctn	Rock Samples	35	Air / Rail / Orig. / Dest.
Dimensions			Dimensional Weight	Priced by

Shipper	Class: Rail	Class: Air	Paid Beyond: XXX	Paid Beyond: XX
Joseph Porter				

Address of Shipper or Actual Point of Origin: Rosalore, Ariz

SHIPPER'S RECEIPT
Prepaid
Air Express

RAIL CHARGES	AIR CHARGES
Value Charge To Airport	Air Value Charge
Rail Exp. Chgs. To Airport	Air Express Charges: 15 50
	Total Air Charges: 15 83
Value Charge From Airport	Total Rail and Air
	Other Charges
Rail Exp. and Other Chgs. From Airport	Total
Total Rail Charges	C. O. D.
	C. O. D. Service Charges

NOTE—The Company will not pay over $50, in case of loss, or 50 cents per pound, actual weight, for any shipment in excess of 100 pounds, unless a greater value is declared and charges for such greater value paid.

Received shipment described hereon, subject to the Air Tariff in effect on the date hereof. Value herein declared by Shipper to be that entered in space hereon, reading, "Declared Value," subject to the terms and conditions of the uniform express receipt on file with the Civil Aeronautics Board and in effect on the date of shipment and to which the parties hereto agree to be bound. *(See Reverse side).*

	Number Pieces	Date	Hour
Bee Cutrell	1	12/11 1972	1150 A.M. / P.M.

for Railway Express Agency, Inc.

CERTIFIED TRUE COPY

James A. Porter

SKYLINE LABS, INC.
SPECIALISTS IN GEOCHEMICAL EXPLORATION
12090 WEST 50TH PLACE • WHEAT RIDGE, COLORADO 80033
TEL.: (303) 424-7718

INVOICE

INVOICE NO.: 9078
JOB NO.: M-1751
P.O. NO.:

DATE: December 26, 1972

TERMS: NET 30 DAYS

SOLD TO: Mr. Joseph Porter
P.O. Box 506
Rosiclare, Illinois 62982

Analysis of 25 Crushed Drill Core Samples

1	Gold (.02 ppm) @ $2.00	$ 2.00
1	Silver @ $1.50	1.50
13	Zinc @ $1.00	13.00
19	Semi-quant spectrographic analysis @ $9.00	171.00
1	Copper, Lead, & Zinc (single digestion) @ $2.10	2.00
11	Lead & Zinc (single digestion) @ $1.60	17.60
25	Fluorine @ $2.00	50.00
25	Samples split and pulverized @ $.50	12.50
	TOTAL	$ 269.70

Pd 12/29/72
Ck # 850

CERTIFIED TRUE COPY
James A. Porter

ORIGINAL INVOICE

HDA - OME
Telephone Expenses
11/15 - 12/15, 1972

Date	Place	Person	Amount
10/27	Lakewood, Cal.	Heyl	$ 9.80
11/15	Boss, Mo.	Donithan	1.45
11/16	" "	"	.95
11/16	Washington	Kirkemo	3.10
11/30	Princeton, Ky.	Trace	.41
12/1	Washington	Kirkemo	4.90
12/13	"	"	1.00
			$21.61
		Tax	2.16
			$23.77

CERTIFIED TRUE COPY

December 28, 1972

Mrs. Vera Bishop
Elizabethtown
Illinois

Dear Vera:

Enclosed find a check in the amount of $110.93, representing wages earned during the month of December.

70 hrs.	x	$1.80	=	$126.00
S. T.	$3.12			
S. S.	6.55			
I. T.	5.40			- 15.07
				$110.93

Sincerely,

Joseph A. Porter

JAP:vb
Encl.

CERTIFIED TRUE COPY

$126.00 earned
6.55 social Security Contri.
132.55 Charge Total

Charge OME 58 hrs @ 1.80 = 104.40
+ 5.2% S.S. Contri. 5.33
Total OME charge 109.73

RECORD OF TIME WORKED

Vera Bishop, 178-18-8537, 0 — December, 1972

Name, S.S. No., Dependents — Month

Day - Date	Start Work	Stop Work	Hrs. Worked	Overtime	Remarks
Fri. 1	11:30	3:30	4		
Mon. 4	11:30	4:30	5		
Tues 5	12:45	3:15	2 ½		
Wed. 6	11:45	3:45	4		
Thurs 7	11:45	3:15	3 ½		
Fri. 8	11:00	3:30	4 ½		
Sat. 9	9:10	2:10	5		
Mon. 11	11:40	3:10	3 ½		
Tues 12	11:30	1:30	2		
Wed. 13	11:45	3:45	4		
Fri. 15	11:30	3:30	4		
Mon. 18	11:30	3:30	4		
Tues. 19	11:30	3:30	4		
Wed. 20	11:30	3:30	4	Accounting	
Thurs. 21	11:30	3:30	4		
Fri. 22	11:30	3:30	4		
Wed. 27	11:30	3:30	4	Accounting	
Thurs. 28	11:30	3:30	4	Accounting	
			70		

RECEIVED
FEB 7 - 1973
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

January 23, 1973

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. John L. Carroll
345 Park Avenue, Room 4120
New York, New York 10022

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois

Dear Mr. Carroll:

This will acknowledge receipt of the original copy of the Performance Bond for the subject contract which has been signed by the three partners. We will attach this to the Government's copy of the contract.

Enclosed is a carbon copy of the Performance Bond, which the partners should sign as principals. The bond should be attached to the Operator's copy of the contract.

Thank you for handling the exchange of copies, and for obtaining the required signatures.

Sincerely yours,

Harold Kirkemo

Harold Kirkemo
Chief, Office of
Minerals Exploration

Enclosure

cc: Director's Reading File
Mineral Resources
OME docket
OME Reading File
Branch of Financial Management
Robert A. Laurence, Knoxville, Tennessee
Mr. Kirkemo

RECEIVED
JAN 26 1973
U.S. Geological Survey
Geologic Division
Knoxville, Tenn.

HKirkemo/gla 1-23-73

OME 6873

MEMORANDUM-INTERIM REPORT

December 3, 1972

TO: Harold Kirkemo, OME, Washington
FROM: Robert D. Trace, Princeton, Ky.
SUBJECT: Hicks Dome, Illinois project; OME ?

At Joe Porter's request, I visited the subject project on December 1, 1972, and briefly examined the available core. Also, we discussed the location of No. 3 drill hole.

OME D.D.H. No. 1 (Proposed hole A and Porter's No. 5) had reached a depth of 2,244 feet(Noon, 12-1-72). The stratigraphy in No. 1 shows it to be approximately 50 feet downdip, or lower, than Porter holes 3 and 4 to the north.

Briefly:

0-1792 Unbrecciated carbonate rocks(normal section)

1792-2,000 Breccia, essentially unmineralized

2,000-2,137 Breccia, slightly mineralized(about 5% or less)

2,137-2,224 "Ore zone" See discussion below.

2,224-2,244 Breccia, essentially unmineralized

Porter plans to bottom at about 2,300--a reasonably safe distance below the "ore zone".

Pertinent facts regarding the "Ore zone" are:

1. 87 feet thick. Somewhat thinner than 3 and 4(Porter) but still substantial.

2. Eyeball grade 10-12% CaF_2. Also a little lower than numbers 3 and 4.

3. Breccia fragments somewhat larger, i.e. 1/8 to 1 inch in diameter, than in numbers 3 and 4 "ore zone".

4. "Ore zone" in OME 1 is at "proper" or predicted depth, based on Porter holes 3 and 4, thus suggesting continuity with 3 and 4.

5. The mineralization at the base of the"ore zone" cut off rather sharply(within 1 foot), much sharper than in holes 3 and 4 of Porter.

OME D.D.H. No. 2 (proposed hole C, I think, and Porter No. 6) was at 214 feet and in trouble. Driller had twisted drill rod off and was busily engaged in "fishing". Frustrated Joy drill boss wished he was back in Indiana(i.e. home).

Porter and I discussed location of OME No. 3. He wants to put it about 500 feet north of Panky No. 2, approximately the proposed hole D in application. (Incidentally, all my OME file is at Madisonville so I'm using my memory on the proposed hole designations.) There are factors pro and con regarding the location of hole 3 (i.e. D or B), but after considerable discussion, I agreed to his location.

FORM 9-1648
MARCH 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF MINERALS EXPLORATION

OK-
Rev 12-13-72

OPERATOR'S MONTHLY VOUCHER For Month of October, 1972

Docket No. OME- OME-6873
Contract 14-08-0001 2306
Contract Amount $95,450
Gov't. Participation % 50 $ 47,725

Operator's Name Hicks Dome Account c/o Gilbert Kerlin, Esq.
Address Shearman & Sterling, 53 Wall Street New York, New York 10005

COST ITEMS (FROM EXHIBIT A)	FOR OPERATOR'S USE: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS	FOR GOVERNMENT USE ONLY: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS
		$		$		$		$
Category (1)								
T., Crse Rock (Road material)	30.9	54.08	30.9	54.08	30.9 hrs	54.08	30.9 hrs	54.08
Hrs. Dozing	11	137.50	11	137.50	11 hrs.	137.50	11 hrs	137.50
Feet, Rotary drilled	141	549.90	141	549.90	141 ft.	549.90	141 ft.	549.90
Feet Cored, NX	1089	5,221.60	1089	5,221.60	1089 ft.	5,221.60	1089 ft.	5,221.60
Bags, Mud & Additi.	21	112.93	21	112.93	21 bags	112.93	21 bags	112.93
Water supply, Mon.	.7	210.00	.7	210.00	0.7 mo	210.00	0.7 mo.	210.00
Category (2)								
Geol-Supervisor	1	1,250.00	1	1,250.00	1 mo.	1,250.00	1 mo.	1,250.00
Category (3)								
Core Boxes	110	137.50	110	137.50	110 bx.	137.50	110 bx.	137.50
Category (7)								
Office Expenses, Mon.	1	94.23	1	94.23	1 mo.	94.23	1 mo.	94.23
TOTALS		$7,767.74		$7,767.74		$7,767.74		$7,767.74

I certify that the above bill is correct and just and that payment therefor has not been received.

Date Nov. 20, 1972 *Payee Hicks Dome Account

Per Joseph G. Porter Title Geologist

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A willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction is a criminal offense. (U. S. Code, Title 18, Sec. 1001.)

(INSTRUCTIONS ON REVERSE)

Approved as noted, subject to field examination and audit.

Signature Harold Kirkham Chief, OME ~~Field Officer~~ Date 12/13/72

(63) 14X0804

Approved for: $3,883.87
(SUBJECT TO AUDIT)

Signature BMT

Date 20 DEC 1972 Vou. No. 03712A

(SEE OTHER SIDE)

FOR OPERATOR'S USE

REMARKS

Category (1)

We have only been billed for the coarse rock used. Other billing will follow. Due to very wet weather, additional rock, doxing and tractor use will be required for access. Pertinent invoices are attached.

Category (2)

No sampler has been used as yet. Casual labor and help handling the core will be required in November. Geologist-Supervisor is employed at $1400 per month. 100% is charged to the project. Copies of paycheck stubs are attached. Please advise if this is not sufficient.

Category (7)

Secretarial services, typing logs, bit records, daily notes, etc., amounted to 46½ hours totalling $88.03. Telephone billied up to Oct. 15, 1972 amounts to $6.20. Records are attached.

FOR GOVERNMENT USE

REMARKS U 7 9 8 7 U

RECEIVED
U.S. GEOLOGICAL SURVEY

DEC 14 7 50 AM '72

BUDGET & FINANCE

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PREPARATION OF OPERATOR'S MONTHLY VOUCHER, FORM 9-1648

In the left hand column list the items for which costs were incurred during the month, and also the items for which costs were previously reported. For items previously reported, show only UNITS TO DATE and COSTS TO DATE. Items listed should conform to Exhibit A of the contract (Estimated Costs of the Work). The total of COSTS THIS MONTH followed by the Operator's signature constitutes a claim for payment of the Government's share of the costs. The Operator or his agent must sign the certification in the lower left corner.

Except for amounts claimed under "fixed unit costs" provisions of the contract, all costs claimed in this voucher must be supported by documentary evidence consisting of: (a) certified copies or transcripts of payrolls which list each employee, wage rate, period of employment, gross earnings, and net earnings; (b) original or certified copies of invoices, statements of accounts, or purchase orders which indicate items of materials or services, quantities, unit prices, total charges, and payment terms; and (c) certified memoranda of the Operator for such items as unemployment taxes, employee's liability insurance, and depreciation of Operator-owned equipment. The certification may be stated thus, "Certified True Copy", followed by the signature of the Operator or his agent. One copy of each document should accompany the original of this voucher.

The requirement for submitting documentary evidence of claimed costs may be waived by the OME regional Field Officer if he determines that it is impracticable for an Operator to submit this material. In any case of waiver of this requirement an "on-site" audit by an OME auditor is mandatory prior to payment of the final Operator's Monthly Voucher.

Operator's Narrative Report
October, 1972

Work done during October consisted of preparations for and drilling of Hole OME-1. The hole was collared on October 5 and was drilled to a total depth of 1,230 feet during the month. Progress has not been sufficient to evaluate the hole from a geologic point of view. A summary log is attached.

Good progress was made until numerous cavities were encountered from 998 feet to 1,185 feet. The start of the cavities coincided with the top of the Silurian limestones.

These cavities created considerable problems and ultimately caused loss of the hole from 1000 feet to 1,230 feet. After penetrating the cavities with NX rods, the rods were accidentally dropped in the hole. They were broken off in the cavities and were impossible to fish out. An attempt was then made to take advantage of the natural deflection in the cavities and to drill past the lost tools. This attempt failed when the rods twisted off again in the cavities, resulting in tools which were impossible to retrieve.

As of the end of the month an attempt was being made to set a wedge at 989 feet and drill past the cavities and the lost tools. This was successful.

Stratigraphy penetrated to date has been a normal sequence of Devonian and Silurian rocks. Recognizable stratigraphic markers indicate that the contacts are approximately sixty to sixty-five feet below those in Hamp No. 3.

Mineralization encountered to date has been negligible. It consists of odd traces of fluorite, generally associated with calcite in vugs or fractures. Odd specks of sphalerite and galena have been seen.

The core is fairly well fractured throughout. Small minus one-half inch offsets along vertical fractures are very common. These are generally filled with calcite.

There are scattered patches and veins of brecciated limestone in a calcite matrix. The fragments generally consist of limestone, resembling those of nearby wallrock. Several small igneous dikes have been seen. These consist of very fine grained gray material with coarse angular fragments of lighter colored material, which is thought to be granite. These were fairly common in Hamp No. 3 and Hamp No. 4.

A very detailed geologist's log is available if required. Sections will be submitted when the hole is completed.

Respectfully submitted,

Joseph A. Porter

Joseph A. Porter

SUMMARY LOG
OME-1 (Hamp Property)
October, 1972

FORMATION	DESCRIPTION	THICK.	DEPTH
Overburden	Cherty residuum	119	119
Clear Creek ls.	Crystalline, light tan, light gray, cherty & very cherty, slightly dolomitic	372	253
Backbone ls.	Finely crystalline, pure, light gray, stylolitic	414	42
Upper Grassy Knob	Upper part dark gray, siliceous & argillaceous, all cherty, middle part resembles Clear Creek	581	167
Grassy Knob chert	30% to 70% chert in dark gray argillaceous limestone	796	215
Bailey ls.	Very fine, very silty, gray, speckled limestone	998	202
SILURIAN			
Moccasin Springs ls.	Very fine, dense, silty & dolomitic, light gray with streaks & patches of pink, wavy argillaceous streaks, pyrite crystals throughout	1113	115
St. Clair ls.	Very dense, light, gray, scattered pink rhombs, partly nodular	1171	57
Sexton Creek ls	Dense, light gray, pure	1192	21
Edgewood ls	Gray, fine grained, abundant argillaceous streaks, abundant dark gray chert	1230	

O. R. AUSTIN & SONS
Contractors
ROSICLARE, ILLINOIS 62982

INVOICE

No 1657

TO
Mr Joseph Porter
Rosiclare, Illinois

DATE 10/24/72
CUSTOMER ORDER NO.
SALESMAN
VIA

TERMS: Net

QUANTITY	DESCRIPTION	PRICE	AMOUNT
10/2/72	30.90 tons rock delivered to Hicks Dome @	$1.75/ton	$54 08
	Paid #827 $54.08 10/26/72		
	THANKS		

ORIGINAL

Thank You!

CERTIFIED TRUE COPY

STATEMENT

FROM Larry Robinson

For: Use of D-4 Tractor dozing access road and drill site

~~Oct. Sept.~~ October 19 1972

TO Hicks Dome Account c/o Joseph A. Porter

STREET Box 447

CITY Rosiclare, Illinois TERMS

11 hrs. @ $12.50/hr.	$137.50
Total Due	$137.50
Ck # 833 12/1/72	$137.50

Larry Robinson
Larry Robinson

TRAIN CABOT INC 003697879

EARNINGS	HOURS	AMOUNT	DEDUCTIONS			YEAR TO DATE	
REGULAR		70000	FED.TAX	10067	STATE TX 1333	GROSS PAY	1325000
						F.I.C.A.	46800
						FED. TAX	183340
						STATE TAX	24790
						FOR PERIOD ENDING	10-31-72
						NET PAY	
TOTAL EARNINGS		70000	TOTAL DEDUCTIONS		11400		586.00

JOSEPH A PORTER 501 1 020 00044 NON-NEGOTIABLE

5755
1MM 12-71

STATEMENT OF EARNINGS AND DEDUCTIONS

TRAIN CABOT INC 000839417

EARNINGS	HOURS	AMOUNT	DEDUCTIONS			YEAR TO DATE	
REGULAR		70000	FED.TAX	10067	STATE TX 1333	GROSS PAY	1255000
						F.I.C.A.	46800
						FED. TAX	173273
						STATE TAX	23457
						FOR PERIOD ENDING	10-15-72
						NET PAY	
TOTAL EARNINGS		70000	TOTAL DEDUCTIONS		11400		586.00

JOSEPH A PORTER 501 1 020 00044 NON-NEGOTIABLE

5755
1MM 12-71

STATEMENT OF EARNINGS AND DEDUCTIONS

CERTIFIED TRUE COPY

James A Porter

JOY MANUFACTURING COMPANY

OLIVER BUILDING
PITTSBURGH, PENNSYLVANIA 15222

PLEASE REMIT TO
P. O. BOX 360135M
PITTSBURGH, PA. 15230

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORD'R NO.	DATE	AT REC. POINT	B.O.NO.
CONTRACT	CODE 99 69 05 14 03 209			DATE	AT SHIP POINT	

31180

SOLD TO
Mr. Gilbert Kerlin
53 Wall Street
New York, New York 10005

TERMS NET 30 DAYS
NO CASH DISCOUNT

INVOICE NO. 05116359

INVOICE DATE 11-8-72

PLEASE REMIT TO
P.O. BOX 360135M
PITTSBURGH, PA. 15230

DATE SHIPPED

SHIPPED TO
Hicks Dome, Illinois

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM Michigan City, Indiana

ORIGINAL QUANTITY ORDERED	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 1,230' core drilling at Hicks Dome, Illinois for period ending October 25, 1972 as per agreement.					
	PROSPECT NO.	FROM TO		TOTAL FT.	COST UNIT		TOTAL COST
	H-5	6¼" R.B. 0. 134.		134.	3.90		$ 522.60
		3-7/8" R.B. 134. 141.		7.	3.90		27.30
		NX 141. 500.		359.	4.40		1,579.60
		NX 500. 1000.		500.	4.80		2,400.00
		NX 1000. 1230.		230.	5.40		1,242.00
							$5,771.50
	CORE BOXES USED						
		110 Cardboard Core Boxes @ $1.25/ea.					137.50
	MUD USED UP						
		19 100-lb. bags drilling mud @ $3.09/bag				58.71	
		1 50-lb. bag Caustic Soda				10.85	
		1 50-lb. bag Quebracho				20.78	
						90.34	
		Transportation & Handling @ 25%				22.59	112.93
	FURNISHING WATER (PUMPING)						
		Oct. 5 through Oct. 25 @ $300.00/mo.					210.00

CERTIFIED TRUE COPY

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

4134 4/67

09008

JOY MANUFACTURING COMPANY

PAGE NO. 2

SOLD TO Mr. Gilbert Kerlin

OUR ORDER NO.	AT REC. POINT	AT SHIP POINT	B.O. NO.	INVOICE NO.
				05116359

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	SALES CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
	SURVEY TIME							
		H-3	Sept. 28 7 hours Sept. 29 8 hours					
			15 hours @ $16.00/hr.					$ x 240.00
								$6,471.93

x not charged OME

INVOICE (CONTINUATION)

FORM P138A

November 6, 1972

Mrs. Vera Bishop
Elizabethtown
Illinois

Dear Vera:

Enclosed find a check in the amount of $86.32 representing wages earned during the month of October.

52½ hrs.	x	$1.80	=		$94.50
S. T.	$2.37				
S. S.	4.91				
I. T.	.90				- 8.18
					$86.32

Sincerely,

Joseph A. Porter

CERTIFIED TRUE COPY

Joseph A. Porter

JAP:vb
Encl.

Chase OME-HDA 46½ hrs = 83.70
+ S.S. 4.33
88.03
Total

RECORD OF TIME WORKED

Vera Bishop, 178-18-8537, 0
Name, S.S. No., Dependents

October, 1972
Month

Day - Date	Start Work	Stop Work	Hrs. Worked	Overtime	Remarks
Wed. - 4	12:30	3:30	3		Col.
Thurs.-5	9:00	3:30	6		HDA
Tues.-10	12:00	3:30	3½		HDA
Thurs.-12	12:00	4:30	4½		HDA
Mon. - 16	9:00	4:30	7		HDA
Tues.- 17	9:00	4:30	7		HDA
Wed. - 18	9:30	4:30	6½		HDA-3½; 3 Misc.
Thurs.-19	12:30	4:30	4		HDA
Tues. -24	9:00	3:00	5½		HDA
Thurs.-26	9:00	3:30	5½		HDA

CERTIFIED TRUE COPY

Vera Bishop

OPERATOR'S NARRATIVE REPORT
November, 1972

During November Hole OME-1 was drilled 1,054 feet and was within 62 feet of its total depth at the end of the month. In order to speed up progress a second machine was brought in and used to start Hole OME-2. This hole was started on November 16 and was drilled to a depth of 215 feet by the end of the month.

Submitted with this report is a map on the scale of 1" = 400', showing the locations of the subject holes. Also submitted is a section of Hole OME-1, showing the relationship of the geology to that of the previous Hamp holes, a summary log for Hole OME-1, and copies of the detailed Geologist's log for the breccia zone. Inasmuch as Hole F-1 is just being started, no log is submitted.

Hole OME-1 is considered to have been moderately successful from a geologic point of view. It apparently has confirmed a favorable horizon for fluorite mineralization between 600' and 700', stratigraphically beneath the base of the Maquoketa shale. This coincides with the bottom part of the Plattin limestone. The bottom of the favorable zone coincides approximately with the contact between the Plattin limestone and Joachim dolomite. The favorable zone contained significant mineralization but was estimated to be lower in grade than where previously intersected.

Breccia was encountered at a depth of 1792', and the hole was still in breccia at 2,326'. Four distinct types of breccia were recognized during the initial core study. These are generally described in the summary log and closely described in the detailed log.

Breccias of most interest were the gray, rock flour breccia from 2,000' to 2,136' and the purple breccia from 2,136' to 2,224'. Pertinent assays of both zones are pending.

The upper contact of the gray rock flour breccia was transitional. The lower contact was quite sharp. With depth the breccia appeared to become gradually finer with more matrix material. There appeared to have been a correspondingly gradual increase in amount of fluorite mineralization.

It is possible that this zone represents a "purple breccia" zone that is comparatively weakly mineralized. Pointing to this is the fact that the zone contains fairly rich patches of fluoritic, baritic matrix, pyrite and lightly disseminated galena and sphalerite. It also contains the distinct scattered, coarse, pale yellowish green barite phenocrysts which are common in the "purple breccias".

Distinct, fluoritic "purple breccia" was encountered from 2,136.5 to 2,224, a total of 87.5'. Top and bottom contacts were very distinct. The zone is easily recognizable as the same zone encountered in H-3 and H-4, because of its similar mineralogical and physical character. It correlates well both in elevation and in stratigraphic position. It differs only in that it is thinner and appears to contain more low grade zones with less matrix and more coarse fragments (+¼").

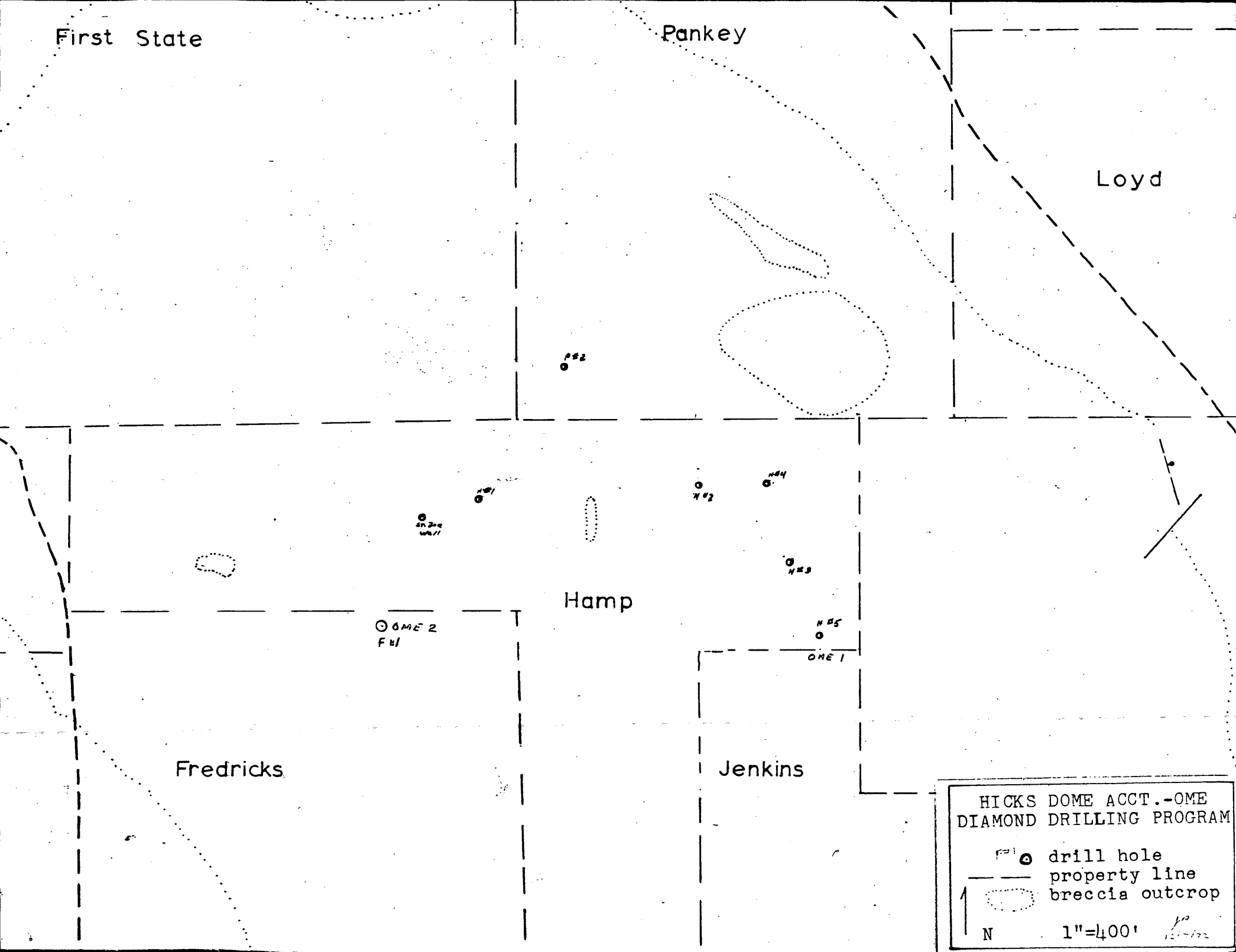
Relevant zones have been split, crushed and split again and sent off for various assays, including some spectrographic work.

An interesting zone of mineralization was intersected from 1730.0 to 1732.0 in unbrecciated Plattin limestone. It consisted of crudely banded, well replaced limestone with appreciable galena. It also contained fluorite, barite, sphalerite with some chalcopyrite. This mineralization resembles bedding replacement seen in the Cave-in-Rock district. It roughly corresponds with a similar zone in Hole H-5. Assays are pending.

No conclusions can be made at this time about Hole OME-2. At 215' it is in Clear Creek limestone, but nothing has been distinct enough to give a good stratigraphic marker.

Respectfully submitted,

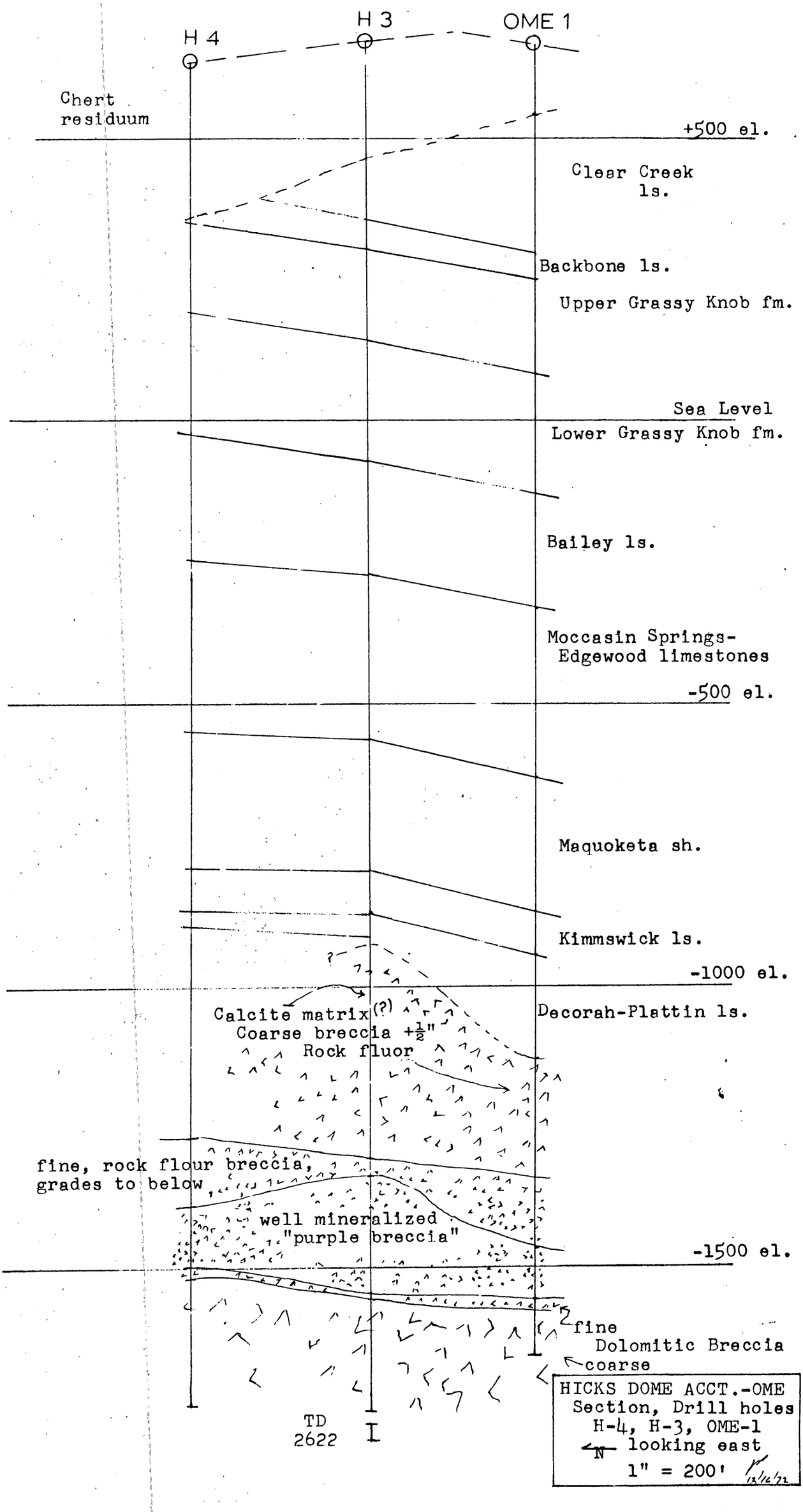
Joseph A. Porter


First State
Pankey
Loyd
Hamp
Fredricks
Jenkins
P #2
H #1
H #2
H #4
H #3
H #5
OME 2
F #1
OME 1
HICKS DOME ACCT.-OME
DIAMOND DRILLING PROGRAM
drill hole
property line
breccia outcrop
N
1"=400'

SUMMARY LOG
OME-1 (Hamp Property)

FORMATION	DESCRIPTION	THICK.	DEPTH
Overburden	Cherty residuum	119	119
Clear Creek ls.	Crystalline, light tan, light gray, cherty & very cherty, slightly dolomitic	253	372
Backbone ls.	Finely crystalline, pure, light gray, stylolitic	42	414
Upper Grassy Knob	Upper part dark gray, siliceous & argillaceous, all cherty, middle part resembles Clear Creek	167	581
Grassy Knob chert	30% to 70% chert in dark gray argillaceous limestone	215	796
Bailey ls.	Very fine, very silty, gray, speckled limestone	202	998
SILURIAN			
Moccasin Springs ls.	Very fine, dense, silty & dolomitic, light gray with streaks & patches of pink, wavy argillaceous streaks, pyrite crystals throughout	115	1113
St. Clair ls.	Very dense, light, gray, scattered pink rhombs, partly nodular	57	1171
Sexton Creek ls.	Dense, light gray, pure	21	1192
Edgewood ls.	Gray, fine grained, abundant argillaceous streaks, abundant dark gray chert	100	1292
ORDOVICIAN			
Maquoketa shale	Dark gray, well laminated, silty, sandy in part, fairly hard, pyritic, fractured	240	1532
Kimmswick ls.	Crystalline, medium & coarse, light gray, very pure, stylolitic	72	1604

FORMATION	DESCRIPTION	THICK.	DEPTH
Decorah-Plattin ls.	Very fine grained, dark brownish gray with wavy argillaceous streaks, all rather pure	188	1792
Breccia	Fine medium and coarse angular fragments of Plattin limestone, all tightly interlocked, very little matrix material, principally rock flour, some calcite, traces fluorite, barite, galena and sphalerite throughout	208	2000
Gray rock flour breccia	All fine, with gradually increasing amount of rock flour matrix, gradually becoming more fluoritic toward bottom, range from 1% to 6% CaF_2, some barite as coarse pale yellowish green crystals, traces Zn & Pb	136.5	2136.5
Purple breccia	Fine, well flouritized, with barite & traces Pb & Zn, spar 5% to 16% distinctly purple or dark blue due to matrix having been replaced by fluorite, fairly abundant +$\frac{1}{4}$" fragments unreplaced	87.5	2224
Dolomitic breccia	Mostly small angular fragments of dolomite & quartzitic sandstone in sandy, dolomitic matrix, traces fluorite, top contact very sharp	46	2270
Coarse dolomitic breccia	Mostly large fragments of dolomite & quartzite with patches of finer breccia	56	2326
TOTAL DEPTH			


H 4
H 3
OME 1
Chert residuum
+500 el.
Clear Creek ls.
Backbone ls.
Upper Grassy Knob fm.
Sea Level
Lower Grassy Knob fm.
Bailey ls.
Moccasin Springs-Edgewood limestones
-500 el.
Maquoketa sh.
Kimmswick ls.
-1000 el.
Decorah-Plattin ls.
Calcite matrix (?)
Coarse breccia +½"
Rock fluor
fine, rock flour breccia, grades to below
well mineralized "purple breccia"
-1500 el.
fine
Dolomitic Breccia
coarse
TD 2622
HICKS DOME ACCT.-OME
Section, Drill holes
H-4, H-3, OME-1
N looking east
1" = 200'
12/16/72

Sheet No. 19

Depth Feet	Formation	No.	Width
	medium, fairly abundant dark gray interlaminated streaks and patches that are commonly more dolomitic, little interbedded stylolitic, some dark gray to black chert.		
1759.0-1768.0	Limestone as before, with portions as calc breccia in a veinlet nearly parallel to core.		
1768.0-1787.0	Limestone, as before, with interbedded light gray to white limestone, interlaminated argillaceous streaks throughout, stylolitic throughout, with fairly abundant irregular dark gray streaks, slightly dolomitic, bottom portion tending to become somewhat brecciated.		
1787.0-1793.0	Limestone as above, tend to become increasingly brecciated and grades into below, moderately brecciated upper portion with traces of purple and clear fluorite in breccia matrix, good traces of lead along stylolites at 1780 to 1790, top of breccia zone would be between 1790 and 1795.		
1793.0-1803.0	Breccia consists principally of fine angular fragments of various limestones and dolomites in a light gray rock flour matrix, all slightly dolomitic and silty, odd speck of galena throughout with patches and blebs of purple and clear fluorite, less than 1%, scattered stylolites, moderately pyritic throughout, very few fragments plus one-half inch.		
1803.0-1825.0	Breccia, mixed large fragments of limestone as before, in fine angular breccia as before, breccia matrix consists principally of fine calcareous rock flour and some calcite, few scattered blebs of purple fluorite throughout in matrix and along fractures, odd speck of galena, finer breccia portions are generally finely pyritic, clusters of bladed barite crystals in finer matrix, visible only after etching.		

Sheet No. 20

Depth Feet	Formation	No.	Width
1825.0-1841.0	Breccia, mostly fine, little medium, consists principally of small angular fragments, all very tightly interlocked in a gray rock flour matrix, very little matrix material, fragments mostly minus one-half inch, few fragments plus one-half inch, fragments principally those of Plattin limestone.		
1841.0-1846.0	Limestone, gray to dark gray, very dense, very fine grained, slightly fractured throughout.		
1846.0-1855.0	Breccia, principally as before, core badly broken throughout, slightly vuggy, little calcite matrix, partly oxidized, entire core badly broken.		
1855.0-1882.0	Breccia, entire unit very uniform and massive, consists mostly of minus half inch angular fragments, all of which are very tightly interlocked, few large fragments, some plus two inches, mixed light and dark gray limestone and dolomitic limestone fragments, matrix principally dolomitic and calcareous, slightly silty rock flour, some calcite, slightly pyritic throughout, bits of fluorite occasionally in blebs in matrix material, odd speck of galena throughout.	935	1873-1882
1882.0-1920.0	Breccia, mostly fine, some medium and coarse, essentially as before, fragments generally angular, tightly interlocked, very little matrix material throughout, upper portions contain some calcite, and fair traces of bladed white barite crystals in matrix and vugs, entire unit is somewhat pyritic, matrix commonly somewhat fluoritic with purple and clear fluorite commonly associated with pyrite crystals.		
1920.0-1960.0	Breccia, as before, generally fine, some larger plus two-inch fragments scattered, all tightly interlocked, very little matrix material, occasional stylolite parallel to		

Sheet No. 21

Depth Feet	Formation	No.	Width
	core, breccia unit so far is remarkably uniform, barite and fluorite in matrix as before, both less than 1%, traces of zinc and lead.		
1960.0-2000.0	Breccia as before, slightly more matrix material, and few places where breccia is very fine, mineralization is as before, bottom portions possibly somewhat darker in color.		
2000.0-2030.0	Breccia, as before, fragments tend to be becoming smaller and finer, slightly more matrix material toward bottom, entire unit is all rather uniform and massive, fragments possibly are slightly less angular, few stylolites throughout, grades into unit below, mineralization as before, little pale purple fluorite in fractures.		
2030.0-2039.0	Breccia, mostly fine with some very fine, somewhat darker and more fluoritic than before, estimate fluorite at 2%, increased amount of crystalline pyrite, part of unit consists of very fine angular fragments, definite increase in amount of fine and small angular fragments (minus eighth of an inch), and increase in amount of matrix material.	936	9'
2039.0-2049.0	Breccia, gray, becoming increasingly fine, with purple fluorite in matrix, few patches fairly rich, possibly 10%, unit overall approximately 2%, with purple fluorite in fractures and occasional fine bleb of crystalline purple fluorite,	937	10'
2049.0-2059.0	Breccia, mostly very fine, little medium, fragments mostly minus one-eighth inch in gray rock flour matrix, in places the matrix is purple and fairly well replaced with fluorite, estimate fluorite at 2%, fairly abundant crystalline pyrite, traces of sphalerite.	938	10'

Sheet No. 22

Depth Feet	Formation	No.	Width
2059.0-2071.5	Gray breccia, all very fine, matrix principally gray rock flour, moderately well replaced with purple fluorite, and traces of sphalerite, few rich patches purple fluorite, estimate fluorite 2%.	939	12.5'
2071.5-2081.0	Gray breccia, all very fine, in gray fluoritic rock flour matrix, tending to be darker than before, purple fluorite disseminated in matrix and as odd purple patch or streak, estimate fluorite at 2½%, fair traces of sphalerite throughout, odd speck of galena, fairly abundant pyrite.	940	9.5'
2081.0-2089.0	Breccia, all very fine, gray, slightly purple, fairly abundant disseminated yellow sphalerite and purple and clear fluorite, estimate spar at 2½%, purple spar in small fractures.	941	8'
2089.0-2099.0	Breccia, all very fine, angular to subrounded fragments in mixed purple fluoritic and rock flour matrix, matrix somewhat dolomitic and partly sandy, matrix makes up less than 20% of total rock, would consider this low grade purple breccia, disseminated yellow zinc throughout, estimate 0.3% Zn, spar 4.5%, fluorite occurs as small purple and clear dissemination, some fairly coarse, pyritic throughout.	942	10'
2099.0-2109.0	Breccia, as before, small angular fragments in a more purple matrix, considered as low grade purple breccia, somewhat better replacement in matrix by fluorspar, few patches of fairly rich looking material, there are occasional patches of deep purple breccia material that looks like original purple breccia which has been rebrecciated, few odd small fragments of pink, pyritic Silurian limestone can be seen (?), estimate fluorspar at 5%.	943	10'

Sheet No. 23

Depth Feet	Formation	No.	Width
2109.0-2119.0	Breccia, very fine subangular to subrounded fragments in gray, somewhat fluoritic, purple, rock flour matrix, fairly well mineralized throughout, with purple fluorite as replacements in the matrix, fissure filling and crystalline blebs, few zones possibly as much as 10%, overall estimated at 4%, the fluorite generally associated with flecks of yellow sphalerite, few traces of lead, matrix somewhat dolomitic, few odd crystals of yellowish green clear barite, which are typical of purple breccia zone.	944	10'
2119.0-2129.0	Breccia, gray and purple as above, slightly more fluorite, estimated 5% to 6%, few patches possible 10%, somewhat more abundant barite as above.	945	10'
2129.0-2136.5	Breccia, gray-purple, fluoritic as before, few more rich patches and blebs of dark purple to black fluorite, estimate spar at 4%, grades rather quickly into below, few odd fragments of sandstone or quartzite.	946	7.5'
2136.5-2145.5	Purple breccia, fine angular fragments of limestone, some dolomite in a distinctly purple, fluoritic matrix, typical of other purple breccias, except contains somewhat more of plus one-half inch fragments, fairly abundant crystalline barite, fair traces of sphalerite throughout, matrix generally insoluble, upper parts appear to be approximately 20%, estimate average at 12%.	947	8.5'
2145.5-2154.0	Breccia, mostly very fine, mixed purple fluoritic and gray rock flour breccia, grading into each other, few coarse fragments throughout, fluoritic portions look quite rich and are mineralized as above, estimate entire unit at 6%.	948	8.5'

Sheet No. 24

Depth Feet	Formation	No.	Width
2154.0-2160.5	Purple breccia, mostly fine angular fragments in a purple fluoritic matrix, similar to as above, possibly more abundant breccia fragments, matrix mineralized as before, possibly somewhat less matrix material, though breccia so far may be somewhat more baritic, estimate fluorite at 10%.	949	6.5'
2160.5-2169.0	Purple breccia, as above, with more abundant mixed rock flour breccia, all fluoritic, locally as much as 20%, mineralized and similar to as before, fluorite estimated at 7%.	950	8.5'
2169.0-2179.0	Purple breccia, as before, few richer patches, generally lower grade throughout, contains fluorite, barite, lead, and zinc as before, estimate fluorite at 5 %.	951	10'
2179.0-2190.0	Purple breccia, as above, few patches of very rich resembling rebrecciated breccia, matrix mineralized as before, fairly abundant fragments, some of which are plus one-half inch, minor zones appear to be better mineralized, estimate fluorspar at 8%.	952	11'
2190.0-2197.0	Purple breccia, mostly fine angular fragments, few coarser fragments, matrix fairly well replaced, occasional large (plus ¼ inch) crystal of pale yellow-green barite, few large fragments scattered, matrix mineralized as above, fluorspar estimated at 10%.	953	7'
2197.0-2208.0	Mixed purple and gray rock flour breccia, all fluoritic throughout, few zones fairly rich, purple fluorite as before, fairly abundant rather coarse fragments, fairly abundant barite, rich patches of fluorite, 15% to 20%, entire unit estimated at 7%, few fairly sandy zones, bottom contact rather sharp, appears to be dipping at a 30° angle.	954	11'

Sheet No. 25

Depth Feet	Formation	No.	Width
2208.0-2216.0	Purple breccia, only somewhat finer than before, better replacement of matrix by purple fluorite, crystalline barite and traces of lead and zinc as before, fragments are mostly fine, contains fairly abundant plus ½ inch, bottom 1' all very fine blue material that has been replaced by fluorite with only an occasional light colored subangular fragment, estimate spar at 12%.	955	8'
2216.0-2224.0	Purple breccia, fine and medium angular fragments of limestone, dolomite, and more abundant sandstone in a purple fluoritic matrix, parts appear to be rather rich, fairly abundant large fragments throughout, sand fragments somewhat more abundant, estimate spar at 10%.	956	8'
	NOTE: This purple breccia zone is very similar to that in Hamp 3 and 4, except that it is lower grade, apparently due to the increased number of larger fragments in the breccia. Zone may be somewhat richer in barite than has been previously seen, assuming that the coarse, pale green and clear fragments are barite. Bottom contact is very sharp. One and one-half feet of core was lost in the vicinity of the bottom contact, so actual contact can't be seen.		
2224.0-2237.0	Breccia, gray to light gray, very dolomitic, consists of coarse and fine angular fragments of light gray dolomite in a dolomitic matrix, fairly abundant scattered fragments of quartzitic sandstone, few very large pieces (plus 6 inches) but mostly fairly fine, little scattered clear and purple fluorite in matrix material.		

Sheet No. 26

Depth Feet	Formation	No.	Width
2237.0-2257.0	Breccia, mostly as above, mixed very fine and very coarse, all very dolomitic, few patches of fine breccia with faint purple trace, finer portions better replaced by fluorite, upper portions somewhat darker gray.		
2257.0-2270.0	Breccia, mostly fine, few plus one-half inch fragments, consists of fine angular fragments of dolomite and quartzitic sandstone in a dolomitic matrix, traces of purple spar and clear spar in matrix material.	957	13'
2270.0-2296.0	Coarse breccia, principally coarse, angular fragments of light gray granular, sandy appearing dolomite, with scattered odd patch of fine breccia, finer portions with rock flour matrix, traces of purple and clear fluorspar throughout in matrix material, little scattered sandstone fragments, would consider typical of coarse dolomite breccias seen in other holes.		
2296.0-2312.0	Coarse dolomitic breccia, as before, few patches of fine with purple fluorite in matrix, few blebs of coarse crystalline fluorite in fractures toward bottom.		
2312.0-2326.0	Breccia, mostly fine, anguler fragments, few fairly coarse and very fine, all angular to subangular dolomite, all tightly interlocked with little matrix material, quartzite throughout, fractures commonly filled with purple to clear spar, small patch of green spar at 2325, estimate spar throughout at 1%.		

TOTAL DEPTH

Tropari survey

Depth	Dip	Direction
1260'	-85°	552° W
1800'	-87°30'	580° W
2316'	-89°30'	---

FORM 9-1648
MARCH 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF MINERALS EXPLORATION

✓ HR 12/27/72

OPERATOR'S MONTHLY VOUCHER For Month of November, 1972

Operator's Name Hicks Dome Account c/o Gilbert Kerlin, Esq.

Address Shearman and Sterling, 53 Wall St. New York, New York 10005

Docket No. OME- ~~OME-6873~~ 2306

Contract 14-08-0001

Contract Amount $ 95,450

Gov't. Participation % 50 $ 47,725

COST ITEMS (FROM EXHIBIT A)	FOR OPERATOR'S USE: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS	FOR GOVERNMENT USE ONLY: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS
		$		$		$		$
Category (1)								
Hrs. Dozing	8.0	100.00	19	237.50	8 hrs	100.00	19 hrs	237.50
Rotary Drilled	120'	468.00	261'	1,017.90	120 ft	468.00	261 ft	1,017.90
Cored, NX 0'-500'	95'	418.00	454'	1,997.60	95 ft	418.00	454 ft	1,997.60
500'-1,000'	-	-	500'	2,400.00			500 ft	2,400.00
1,000'-1,500'	-	-	230'	1,242.00			230 ft	1,242.00
Cored, BX								
1,000'-1,500'	270'	1404.00	270'	1,404.00	270 ft	1,404.00	270 ft	1,404.00
1,500'-2,000'	500'	3050.00	500'	3,050.00	500 ft	3,050.00	500 ft	3,050.00
2,000'-2,500'	264'	1927.20	264'	1,927.20	264 ft	1,927.20	264 ft	1,927.20
Reaming	228'	684.00	228'	684.00	228 ft	684.00	228 ft	684.00
Wter Supply, Mons.	1	300.00	510	510.00	1 mo.	300.00	1.7 mo	510.00
Drilling Mud, bags	-	-	19	58.71			21 bags	112.93
Caustic Soda	-	-	1	10.85				
Quebracho	-	-	1	20.78				
Freight & Handling	-	-		22.59				
Category (2)								
Geol.-Supervisor	1	1250.00	2	2,500.00	1 mo	1,250.00	2 mo.	2,500.00
Sampler (part time)	1	108.88	2	108.88	1 mo	108.88	1 mo	108.88
Category (3)								
T., Crse Rock	-	-	30.9	54.08			30.9 tons	54.08
Core Boxes	113	141.25	223	278.75	113 bx	141.25	223 bx	278.75
Category (7)								
Office Expenses	1	88.81	2	183.04	1 mo.	88.81	2 mo.	183.04
TOTALS		$ 9,940.14		$ 17,707.88		$ 9,940.14		$ 17,707.88

I certify that the above bill is correct and just and that payment therefor has not been received.

Date Dec. 15, 1972 *Payee Hicks Dome Account

Joseph A. Porter

Per Joseph A. Porter Title Geologist

*When a voucher is signed or receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary," or "Treasurer," as the case may be.

A willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction is a criminal offense. (U. S. Code, Title 18, Sec. 1001.)

(INSTRUCTIONS ON REVERSE)

Approved as noted, subject to field examination and audit.

Signature Robert Weeks 12-22

Asst Chief, OME Field Officer

(63) 14

Approved for: $ 4,970.07
(SUBJECT TO AUDIT)

Signature

Date 1-3-73

FOR OPERATOR'S USE

REMARKS

Category (1)
Two machines were used during the month to drill holes OME-1 (H-5) and OME-2 (F-1).

Category (2)
Due to bad weather and volume of core it was necessary to employ the local land-owner on an as needed basis to help handle the core.

Category (3)
Office charge included $66.28 for secretarial andaaccounting and $22.53 for phone.

FOR GOVERNME

REMARKS

639601

RECEIVED
U.S. GEOLOGICAL SURVEY

DEC 27 3 13 PM '72

BUDGET & FINANCE

RECEIVED
JAN 12 1973
U.S. Geological Survey
Geologic Division
Knoxville, Tenn.

OPERATOR'S MONTHLY REPORT

The Operator, under an Office of Minerals Exploration contract, is required to report monthly to the Government. The report consists of two parts.

FIRST, the Operator's Monthly Voucher on Form 9-1648 listing the project costs incurred and claimed by the Operator is the voucher basis for payment of the Government's share of the cost.

SECOND, the Operator's Narrative Report is a concise description of the work performed, results accomplished, and any unusual situations encountered, illustrated and supported by engineering-geological maps or sketches, drill hole logs, assay reports, etc., as pertinent.

The Operator submits the original and three copies of each of the two sections of this report to the OME regional Field Officer at the end of each month during the life of the contract.

PREPARATION OF OPERATOR'S MONTHLY VOUCHER, FORM 9-1648

In the left hand column list the items for which costs were incurred during the month, and also the items for which costs were previously reported. For items previously reported, show only UNITS TO DATE and COSTS TO DATE. Items listed should conform to Exhibit A of the contract (Estimated Costs of the Work). The total of COSTS THIS MONTH followed by the Operator's signature constitutes a claim for payment of the Government's share of the costs. The Operator or his agent must sign the certification in the lower left corner.

Except for amounts claimed under "fixed unit costs" provisions of the contract, all costs claimed in this voucher must be supported by documentary evidence consisting of: (a) certified copies or transcripts of payrolls which list each employee, wage rate, period of employment, gross earnings, and net earnings; (b) original or certified copies of invoices, statements of accounts, or purchase orders which indicate items of materials or services, quantities, unit prices, total charges, and payment terms; and (c) certified memoranda of the Operator for such items as unemployment taxes, employee's liability insurance, and depreciation of Operator-owned equipment. The certification may be stated thus, "Certified True Copy", followed by the signature of the Operator or his agent. One copy of each document should accompany the original of this voucher.

The requirement for submitting documentary evidence of claimed costs may be waived by the OME regional Field Officer if he determines that it is impracticable for an Operator to submit this material. In any case of waiver of this requirement an "on-site" audit by an OME auditor is mandatory prior to payment of the final Operator's Monthly Voucher.

JOY MANUFACTURING COMPANY

OLIVER BUILDING
PITTSBURGH, PENNSYLVANIA 15222

PLEASE REMIT TO
P. O. BOX 360135M
PITTSBURGH, PA. 15230

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORD'R NO.	DATE	AT REC. POINT	B.O.NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	[illegible]					

31180

SOLD TO
[illegible] Gilbert Kurlin
[illegible] Wall Street
New York, New York 10[illegible]

TERMS NET 30 DAYS
NO CASH DISCOUNT

INVOICE NO. 05116413

INVOICE DATE 12-4-72

PLEASE REMIT TO
P. O. BOX 360135M
PITTSBURGH, PA. 15230

DATE SHIPPED

SHIPPED TO
Hicks Dome, Illinois

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM Michigan City, Indiana

ORIGINAL QUANTITY ORDERED	PART NUMBER	DESCRIPTION			CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
	To 1,249' core drilling at Hicks Dome, Illinois for period end up November 30, 1972 as per agreement.								
	PROSPECT NO.		FROM	TO		TOTAL FT.	COST UNIT		TOTAL COST
	H-5	BX	1230.	1500.		270.	5.20		$1,404.00
		BX	1500.	2000.		500.	6.10		3,050.00
		BX	2000.	2264.		264.	7.30		1,927.20
	F-1	Rotary	0.	120.		120.	3.90		468.00
		BX	120.	215.		95.	4.60		438.00
									$7,267.20
	REAMING								
	F-1		120.	214.		94.	3.00		282.00
			1056	1190.		134.	3.00		402.00
	CORE BOXES USED								
		113 Cardboard Core Boxes @ $1.25/ea.							141.25
	FURNISHING WATER								
		Oct. 26 through Nov. 25, 1972.							
		One (1) month @ $300.00/mo.							300.00
		Certified True Copy							$8,392.45

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED
NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE
GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

4133-6 4/67
4134-SINGLE 4/67

09007

December 4, 1972

Mr. Roy A. Stacey
Elizabethtown, Illinois

Dear Roy:

Enclosed is a check for $98.12, representing wages earned during November, 1972. Amount due was calculated as follows:

46 hrs. @ $2.25	$103.50
S.S.	5.38
	$ 98.12

Thank you.

Sincerely,

Joseph A. Porter

JAP:vb
Encl.

Certified True Copy

103.50
5.38 (Social Security)
108.88 Total charge

5755
TMM 12-71

STATEMENT OF EARNINGS AND DEDUCTIONS

JOSEPH A PORTER

501 1 020 00044 NON-NEGOTIABLE

TRAIN CABOT INC 003796319

EARNINGS	HOURS	AMOUNT	DEDUCTIONS					YEAR TO DATE	
REGULAR		70000	FED.TAX	10067	STATE TX	1333	GROSS PAY	1465000	
							F.I.C.A.	46800	
							FED. TAX	203474	
							STATE TAX	27456	
TOTAL EARNINGS		70000	TOTAL DEDUCTIONS			11400	FOR PERIOD ENDING	11-30-72	
							NET PAY	586.00	

Certified True Copy

5755
TMM 12-71

STATEMENT OF EARNINGS AND DEDUCTIONS

JOSEPH A PORTER

501 1 020 00044 NON-NEGOTIABLE

TRAIN CABOT INC 003747485

EARNINGS	HOURS	AMOUNT	DEDUCTIONS					YEAR TO DATE	
REGULAR		70000	FED.TAX	10067	STATE TX	1333	GROSS PAY	1395000	
							F.I.C.A.	46800	
							FED. TAX	193407	
							STATE TAX	26123	
TOTAL EARNINGS		70000	TOTAL DEDUCTIONS			11400	FOR PERIOD ENDING	11-15-72	
							NET PAY	586.00	

STATEMENT

FROM Larry Robinson

FOR Use of D-4 tractor dozing drill site and digging pond

DATE November 1972

TO Hicks Dome Account c/o Joseph A. Porter

STREET Box 447

CITY Rosiclare, Illinois

8 hrs. @12.50/hr.	$ 100.00
TOTAL DUE	$100.00

Larry Robinson

Ck # 835-811 12/4/72

Certified True Copy

December 4, 1972

Mrs. Vera Bishop
Elizabethtown
Illinois

Dear Vera:

Enclosed find a check in the amount of $58.10 representing wages earned during the month of November.

35 hrs.	x	$1.80	=	$63.00
S. T.	$1.62			
S. S.	3.28			
I. T.	0.00			- 4.90
				$58.10

Sincerely,

Joseph A. Porter

Certified True Copy

JAP:vb
Encl.

Joseph A. Porter

~~$60.70~~

~~3.28~~ (Social Security)

.28

63.00
3.28 (Social Security)
$66.28 Total Charge

RECORD OF TIME WORKED

Vera Bishop, 178-18-8537, 0
Name, S.S. No., Dependents

November, 1972
Month

Day - Date	Start Work	Stop Work	Hrs. Worked	Overtime	Remarks
Fri. 3	11:30	3:30	4		
Mon. 6	12:30	3:30	3		
Mon 13	2:00	4:00	2		
Thurs. 16	12:30	3:30	3		
Fri. 17	11:30	3:30	4		
Tues. 21	12:30	3:30	3		
Wed. 22	1:30	3:30	2		
Mon. 27	3:00	5:00	2		
Tues. 28	11:30	3:30	4		
Wed. 29	12:00	4:00	4		
Thurs. 30	11:30	3:30	4		
			35		All OME-HDA.

Certified True Copy

[illegible]

Telephone Expenses
OME Project
November, 1972

Date	Place	Person		Amount
10/24	Boss, Mo.	Donithan		$ .75
"	Washington	Kirkemo		1.00
10/25	"	"		6.10
11/2	"	"		4.00
11/3	Princeton, Ky.	Trace		.40
"	"	"		2.03
"	Washington	Kirkemo		4.90
"	Carmi	DiKor		1.30
			Total	$20.48
			Tax	2.05
				$22.53

October, 1972

Date	Place	Person		Amount
10/4	Washington	Kirkemo		$2.20
10/6	"	"		4.00
			Total	$6.20

CERTIFIED TRUE COPY

Joseph A. Porter

OCT 27 1972

RECEIVED
NOV - 2 1972
U. S. Geological Survey
Geologic Division

Dr. John C. Frye
Chief, Illinois State Geological Survey
Natural Resources Building
Urbana, Illinois 61801

Re: OME-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hardin County, Illinois
Contract 2306

Dear John:

Our Office of Minerals Exploration (OME) recently executed a minerals exploration contract with the subject Operator, a partnership of three individuals in New York City for the purpose of exploring by diamond core drilling for fluorspar and associated minerals in the mineralized breccias of the Hicks Dome cryptovolcanic structure in Hardin County, Illinois. The total value of the contract is $95,450.00, with the Government's share of allowable costs at 50 percent not to exceed $47,725.00. Total drilling is estimated at about 10,000 feet with no hole to exceed 3,000 feet in depth. Contract work is to be completed within nine months from the date of the contract, September 26, 1972. Drilling on the first of possibly four holes is now in progress.

Mr. Joseph A. Porter, Geologist, Rosiclare, Illinois, is in charge of the contract work for the Operator. Geological Survey geologists will visit the project occasionally to inspect the core. As the Operator is negotiating for leases in addition to those already acquired, he would prefer that publicity about this project be kept at a minimum.

If you or any of your staff have occasion to be in the area of the project, we are confident that Mr. Porter would be pleased to show you the results of the drilling to date.

Sincerely yours,

Chief Geologist

Copies to: Messrs. Gilbert Kerlin,
Robert G. Goelet, Francis Goelet
d/b/a Hicks Dome Account
c/o Mr. John L. Carroll
Room 4120, 345 Park Avenue
New York, New York 10022

Joseph A. Porter, Geologist

cc: Division ~~General~~ File
Director's Reading File
Mineral Resources
OME Docket
OME Reading File
Robert A. Laurence-Knoxville
Harold Kirkemo-OME

HKirkemo/clm 10-26-72

October 20, 1972

RECEIVED
OCT 26 1972
U. S. Geological Survey
Geologic Division

Mr. Joseph A. Porter
Geologist
Rosiclare, Illinois 62982

Re: OME-6873 (Fluorspar, et al.)
Karlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hardin County, Illinois
Contract 2306

Dear Mr. Porter:

We were pleased this morning to receive the signed copies of the subject contract. A copy of this letter to the Operator c/o Mr. John L. Carroll will acknowledge receipt.

In the event that I am unable to visit the project in the very near future, we enclose a supply of the Operator's monthly voucher (Form 9-1648) sufficient for the eight months' tenure of the contract. Enclosed also is an Equal Opportunity notice which should be posted in a conspicuous location on the project site.

I am pleased to hear that the first hole is progressing without difficulty. Hopefully, it will successfully penetrate into mineralized material.

Sincerely yours,

Harold Kirkemo

Harold Kirkemo
Chief, Office of
Minerals Exploration

Enclosures

Copy to Mr. John L. Carroll

cc: Director's Reading File
Mineral Resources
Robert D. Trace, Princeton, Kentucky
Robert A. Laurence, Knoxville, Tennessee
OME Docket
OME Reading File
Mr. Kirkemo

HKirkemo/gla 10-20-72

Memorandum

To: Field Officer, Region III

From: Chief, Office of Minerals Exploration

Subject: OME-6873 (Fluorspar-Beryllium et al)
Hicks Dome Account
Hicks Dome
Hardin County, Illinois

Enclosed is a draft copy of a proposed contract to explore the Hicks Dome property. The draft was submitted to the Solicitor's office on September 6 for review and final preparation. In the meantime would you please review this copy and if you have any comments or corrections to offer, please call us at once so that any corrections can be relayed to Mr. C. L. Martin, attorney, before the final draft is typed.

We will send the signed copies of the contract directly to the Operator for approval and signature. We appreciate your significant contributions to the discussions regarding this proposed project, and your assistance in estimating the costs. Because the property is located in OME Region IV, we will administer the contract in this office with Bob Trace, Princeton, Kentucky, assisting with field inspections.

Harold Kirkemo

Harold Kirkemo

Enclosure

Copy of memo. to Robt. D. Trace
and Region IV

RECEIVED
SEP 11 1972
U. S. Geological Survey
Geologic Division

SEP 6 1972

Mr. Joseph A. Porter
Geologist
Rosiclare, Illinois 62982

Re: [illegible]
Hicks [illegible]
Hicks Dome Property
Hardin County, Illinois

Dear Mr. Porter:

As mentioned to you today during our telephone conversation, all OMR contracts now require certifications of nonsegregated facilities from the Operator and the independent contractors of projects exceeding $10,000. Prior to the award by the Operator of any contract for work to be done on the proposed OMR contract to explore the Hicks Dome property, the Operator shall require the prospective drilling contractor to submit two signed Certificates of Nonsegregated Facilities (Exhibit C). Also enclosed are two copies of Exhibit E-1, Certificate of Nonsegregated Facilities, which should be signed by an authorized representative of Hicks Dome Account. Please return the four signed copies to this office. Copies will be attached to the Government's and the Operator's copies of the contract now in preparation.

Three copies of a performance bond (Standard Form 25) are being sent to Mr. John L. Carroll as you suggested. A bond in the penal sum of $47,725.00 should be furnished by Hicks Dome Account as soon as the proposed contract has been prepared and the date and contract number determined. We will advise Mr. Carroll of this date as soon as possible.

Sincerely yours,

Harold Kirkemo

Harold Kirkemo
Chief, Office of
Minerals Exploration

Enclosures

Copy to: Mr. John L. Carroll
Ninth Floor
340 Park Avenue
New York, New York 10022

cc: Director's reading file
Mineral Resources
OME reading file
Region IV
Region III

Robt. D. Trace USGS
Mr. Kirkemo

HKirkemo/cac 9-6-72

RECEIVED
SEP 11 1972
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON, D.C. 20242

RECEIVED
OCT 10 1972
U. S. Geological Survey
Geologic Division

OCT 4 1972

Messrs. Gilbert Kerlin, Robert G. Goelet,
Francis Goelet d/b/a Hicks Dome Account
c/o Mr. John T. Carroll
Room 4120, 345 Park Avenue
New York, New York 10022

Re: OMK-6873 (Fluorspar, et al.)
Kerlin, Goelet and Goelet d/b/a
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois

Gentlemen:

Enclosed are the original and three copies of a proposed contract to explore the subject property. The contract consists of MMK Form 50 (seven pages), Annex I (three pages), one Performance Bond (Standard Form 25)(two pages), Exhibit A (four pages), Exhibit B (one page), Exhibit B-1 (one page), Exhibit C (one page), and one map (Figure 1). All copies of the contract have been signed for the Government.

If the proposed contract is satisfactory to you, all copies of the contract should be signed by each of the three general partners indicated on page 7, MMK Form 50, and the following copies returned to us:

Government's Copy
Field Office's Copy
Budget and Finance's Copy

The Operator's copy should be retained for your files.

If any part of the proposed copy does not meet with your approval, the original and all copies should be returned to this office together with your comments for consideration. A copy of the proposed contract is being sent also to Mr. Joseph A. Porter, Geologist, Rosiclare, Illinois, who we understand will be in charge of the project work.

Please note that the 8½ percent interest in Article 1(c) of the contract accrues from the dates on which individual payments are made by the Government, and like the principal, is repayable from royalty on production.

Should the proposed contract be acceptable to you, we will forward voucher forms to Mr. Porter and be available to answer any questions about the required monthly reports and other matters which may arise during the

course of the project. Mr. Robert D. Trace, Geologist, U. S. Geological Survey, Princeton, Kentucky, also will be available for consultation about the geological aspects of the work.

Sincerely yours,

Harold Kirkemo

Harold Kirkemo
Chief, Office of
Minerals Exploration

Enclosures

Copy to Mr. Joseph Porter
Geologist
Rosiclare, Illinois 62982

cc: Director's Reading File
Mineral Resources
Robert D. Trace, Geologist, USGS, Princeton, Kentucky
Robert A. Laurence, USGS, Knoxville, Tennessee
OME docket
OME Reading File
Mr. Kirkemo
130

HKirkemo/gla 9-21-72

file

August 2, 1972

Memorandum

To: Robert D. Trace, Geologist, USGS

From: Chief, Office of Minerals Exploration

Subject: OME-6873 (Fluorspar, et. al.)
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois

Thank you for your services to date on the subject property. We are preparing a draft contract for the project now with the assistance of J. W. Hasler for costs and Allen Heyl for plans.

For expenses already incurred and future expenses you may incur when the project is underway, charge your vouchers to Account # 9380-90090 which is the accounting number for the Washington, D.C. office of OME. You may send the vouchers either to this office or directly to Lois P. Williams, Administrative Officer, Office of Mineral Resources, Geologic Division, Washington, D.C.

Your memo of July 3 arrived while I was on leave, July 5 - 24, hence the belated reply. Incidently, while I was on leave, the OME offices were transferred to Room 865, Matomic Building, 1717 H Street, N.W., Washington, D.C. Continue to send correspondence to us at the usual Survey address.

Harold Kirkemo

cc: L.P. Williams
W. Olive/USGS, Lexington
R. A. Laurence/USGS, Knoxville

RECEIVED
AUG 3 - 1972
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

R. A. Laurence

United States Department of the Interior

GEOLOGICAL SURVEY
WASHINGTON, D.C. 20242

June 9, 1972

Hicks Dome Account
c/o Gilbert Kerlin, Esquire
Shearman and Sterling
53 Wall Street
New York, New York 10005

Re: OME-6873 (Fluorspar, et al.)
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois

Gentlemen:

In reviewing your application for financial assistance to explore the Hicks Dome property, we note that copies of a number of legal documents pertaining to the various leases should have accompanied the application. These should be submitted to complete the application. Our comments on each of the leases are as follows:

1. First State Bank lease

Assignment, Antaeus Resources Corp. to Hicks Dome Account, was not submitted.

2. Antaeus-Pankey lease

No copies submitted of deed and assignment of 17/21sts interest in property to Hicks Dome Account.

Percentage interest (4/21sts) of Irby-Pankey is not stated in lease. Copy of assignment to Hicks Dome Account not submitted.

The 12/21sts interest formerly held by Mrs. Mabel Pankey is not explained. Total interests in property appear to exceed 100 percent (4/21sts, 17/21sts, and 12/21sts). Please explain.

3. Loyd lease

No documentation submitted for assignment to Antaeus and to Hicks Dome Account.

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U. S. Geological Survey
Geologic Div.

4. Hamp Lease

Lease supersedes agreement made in 1963, but no mention in new lease that prior lease is superseded. Document assigning lease to Hicks Dome Account was being prepared when application submitted. When completed, please send copy.

5. Fredricks-Coy lease

Lease supersedes agreement made in 1963, but no mention of earlier agreement in new lease. No document submitted for assignment from Antaeus to Hicks Dome Account.

6. Jenkins-Wunderlich lease-option

Earlier agreement made by principals in 1963. Same comments apply as for Fredricks lease.

7. Rose, et al., lease

Earlier agreement made by principals in 1964. Same comments apply as for Fredricks lease.

8. Coan-Quarant lease-option

Please submit copy of assignment Antaeus to Hicks Dome Account when complete.

We note that you will furnish the recording data for leases not yet recorded.

With reference to agreements executed in 1963 and 1964, were any provisions in these agreements in effect when the new leases were executed, and are they still in effect? If so, copies of the earlier agreements should be submitted.

In the event adjoining ground is acquired after an OME contract is executed, the contract would be amended to include these lands under the lien and royalty provisions of the contract.

We enclose for information only one copy each of a Performance Bond (SF 25) and an Affidavit of Individual Surety (SF 28) because you state that a performance bond would be submitted in lieu of lien and subordination agreements. One or both of these documents would be required in the event of a contract, but do not proceed with these at this time.

As you know, we are considering your project proposal and, if the application is approved, perhaps a contract could be offered in FY 1973. The same budget constraints that we have had in the past several years are in effect for FY 1973, beginning July 1, 1972. The assistance that OME can offer will continue to be modest and restricted to only a few of the more promising proposals.

Nothing in this letter should be construed as a commitment by the Government to grant an exploration contract.

Sincerely yours,

Harold Kirkemo

Harold Kirkemo
Chief, Office of
Minerals Exploration

Enclosures

Copy to: Mr. Joseph A. Porter
Geologist
Rosiclare, Illinois 62982

Laurence

Re: OME-6873(Fluorspar et. al.)
Hicks Dome Account
Hicks Dome Property
Hardin County, Illinois

MEMORANDUM REPORT 5/26/72

To: H arold Kirkemo, Chief, OME

From: Robert D. Trace, Geologist
U. S. Geol. Survey
Princeton, Kentucky 42445

This brief report is in response to your request to review the geologic and explorational aspects of the above listed OME application.

The completeness of the applicant's report and the existence of a previous report by the writer on the broad aspects of the area, precludes the necessity of a complete formal report at this time. Please refer to DMEA Docket 3855, which describes the general area and the results of an earlier, albeit shallower than here proposed, exploration project on the same property.

Since the earlier project in 1956, the present applicant has completed four diamond drill core holes to depths of approximately 2,500 feet. The present objective of the writer was:

1. To examine and sample some of the results of this deep exploration
2. To evaluate the potential economic possibilities of the property
3. And to discuss the exploration proposed by the applicant.

The writer conferred with Joe Porter, applicant's geologist, in Rosiclare, Illinois on May 19, 1972. Hamp Hole No. 3 was examined and sampled, and the proposed project was discussed in some detail with Porter.

1. Hamp No. 3 core was examined from about 1,400 to the bottom (2,621), and 10 samples were taken. These samples have been sent to Allen Heyl in Denver for whatever confirmatory analyses you or he may deem necessary. Visual examination by the writer would tend to confirm that this hole does contain 5-10 to 20 percent CaF_2 in a rather thick zone at in-hole depths of about 2,000 to over 2,200 feet. The fluorite-bearing zone is a breccia that consists of scattered country rock fragments generally about 1/4 inch in diameter in a purplish fine-grained ground mass

2. Economic possibilities: No mining at depths of 2,000 feet has been done in this area nor has any metallurgical work been completed on the potential ore--so the writer can only compare with the present type of fluorspar operation, and speculate!

Currently, bedded-type fluorspar ore bodies are from 50 to 200 feet wide, 5 to 20 feet thick, and vary in length or "run" from 200 feet to 2 miles, in mines that are usually a few hundred feet deep. Mine-run ore cutoff varies, but in general 20 to 25 percent CaF_2 ore can be handled. Small zinc and lead values are commonly in the ore, and assist in lowering the CaF_2 cutoff.

In contrast, the potential Hicks Dome ore body is about 2,000 feet in depth, might average from 100 to 200 feet in thickness, and appears to average 10 to 15 percent CaF_2.

Obviously a comparison is extremely difficult because: although Porter suggests that the possibly economic zone may be bedlike, data are still too incomplete to prove this. Several pipe-like mineralized zones are within the realm of possibility. Therefore the area extent is difficult to evaluate at this time. Mining and metallurgical problems and costs are outside my field of competence and I will not even speculate.

An important factor, heretofore unmentioned by me, is the highly unusual rare earth and beryllium content. Based primarily on work by Heyl, there appears to be some correlation between the fluorite and rare earths and possibly beryllium. If the fluorite ore does contain significant quantities of rare earths and beryllium--and the metallurgical problems can be handled--then their byproduct value might be substantial.

3. The applicant is flexible upon location of drill holes. Holes A and B basically are simple offsets of Hamp Nos. 3 and 4. Holes C and D are essentially wildcat holes. I understand via phone and memo from Heyl that Geophysics has flown a closely spaced network over the area and has come up with several anomalies. These data are not available to me as yet, but if they can be available soon, then I suggest that they might be used to assist in hole location. My uncertainty here reflect my wondering whether or not surface anomalies will reflect 2000-foot deep possibly bedded-type ore. Certainly at least one hole south of Hamp 3 and 4 should bethe first hole. Further holes should be predicated on the results of the first, as well as Geophysics' anomaly data.

RECOMMENDATIONS:

I strongly recommend a drilling project for the area. These completely different and highly unusual types of mineralization(perhaps the most unusual in the country, and certainly the most unusual in my limited experience) are present in sufficient quantities to warrant further exploration. The exact location of the proposed drilling should be left open, pending Geophysics' data. Perhaps we can all agree on the first hole(at this time, either Hole A or B would be satisfactory to me) and the remainder of the drilling be set up on a contingency basis.

Robert D Trace
5/26/72

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MAY 30 1972
U. S. Geological Survey
Geologic Division

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
FEDERAL CENTER, DENVER, COLORADO 80225

Office of Minerals Exploration
Building 53 Room 28

RECEIVED
FEB 28 1972
U. S. Geological Survey
Geologic Division
Denver, Colo.

February 24, 1972

Memorandum

To: Chief, Office of Minerals Exploration

From: J. W. Hasler and W. L. Emerick

Subject: Meeting in OME Region III office on Hicks Dome area, Illinois

A pre-application meeting for the purpose of discussing the geology, previous exploration, and proposed exploration of the Hicks Dome area in southern Illinois was held in the OME office, Room 28, Building 53, Denver Federal Center, on February 17, 1972. In attendance were Joseph Porter, a consulting geologist for a Mr. Carroll of New York City, Alan Heyl, J. W. Hasler and W. L. Emerick, all of the U. S. Geological Survey.

The enclosed sketch by Heyl shows the approximate relationship of surface trenches, drill holes, breccia pipe, and project boundaries in the area under consideration. All of the proposed exploration is to be done in the Hamp project area covering the lower two-thirds of the sketch.

Porter gave a fairly complete run down on the stratigraphy of the drill holes shown on the sketch. Pankey No. 1 was stopped at a total depth of 250 feet owing to silica. It was drilled in the center of the Pankey Breccia Pipe and there was no fluorite. Pankey No. 2 was drilled to a total depth of 2,485 feet and was in breccia all the way. There was minor fluorite throughout the total depth but in the interval 2,000 to 2,400 feet there was an increase in fluorite content in the core of 2 to 8%. No analyses were made for Be, Rhe, or Y. Porter called the breccia in this hole a grey breccia.

The Hamp holes were put down by the Carroll interests. Hamp Well Hole and Hamp No. 1 contained minor fluorite and Hamp No. 2 (not shown on sketch) was a shallow, barren hole bottomed in silica. Hamp No. 3 was the richest hole. Beginning at 2,000 feet it went into a purple microbreccia that continued to 2,240 feet. This 240 foot interval ran 12 to 20% fluorite, locally 30%, 1% Be, 0.15% Nb, 1% Y, 0.5% Zn, and 0.3% Pb. The top 60 feet of this 240 foot interval averaged greater

than 1% Be. Above 2,000 feet the hole was leaner in fluorite and not ore. The upper part of the hole was a coarse breccia of crackled limestone cemented by calcite and purple fluorite. The hole was breccia most of the way to the bottom. Porter stated that the tops of the breccia fragments have more fluorite deposited on them than the bottom and sides, suggesting upward flow of solutions. Hamp No. 4 is similar to Hamp No. 3. The best microbreccia fluorite interval was from 1,900 to 2,150 feet with leaner fluorite continuing from this interval to the bottom of the hole at 2,380 feet. This interval is the same zone as the 2,000 to 2,240 feet interval in Hamp No. 3 and at the St. Peter-Pottsville contact. There was little breccia above 1,900 feet in this hole and it is leaner in fluorite and Be (about 0.5% Be) than Hamp No. 3.

Heyl does not agree with Porter's idea of a N-S crescent-shaped trend for the fluorite zone because it heads directly for the barren Pankey Breccia Pipe which contains no fluorite. Heyl favors a south trend because of a radiometric anomaly in that direction. Porter is not aware of the radiometric anomaly as it is confidential U.S.G.S. data.

Porter's proposal included the drilling of 4 diamond drill core holes, each approximately 2,500 feet in depth, at a total cost of about $80,000. It was also stated that the anticipated work may include wedging to the east in the Hamp No. 3 and No. 4 holes from an approximate 1,000 foot depth in the two holes, and then continuing the wedge drilling for approximately 1,000 to 1,200 feet to the target zone. The bottoms of the wedged holes when completed would be in the same line as the 4 proposed vertical holes. Spacing of the proposed holes would be at intervals suitable for projecting reserves of rather thick fluorite-bearing breccia zones. It was not clearly stated whether the wedging in the Hamp Nos. 3 and 4 would be at the applicants' expense or included as part of the project.

Because there are so many owners of fractional land shares involved, the applicant will propose to furnish a performance bond in lieu of Lien and Subordination Agreements. The applicant wants his land acquisition activities kept quiet because of possible involvement of other mine operators in the district.

J. William Hasler

J. William Hasler,
Field Officer, Region III
Office of Minerals Exploration

and

William L. Emerick

William L. Emerick,
Assistant Chief,
Office of Minerals Exploration