Docket Copy
Surname:
Houk
Kamb
Kiilsgaard
Selfridge.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

OCT 15 1956

The New Jersey Zinc Company
160 Front Street
New York 38, New York

Re: Docket Nos. DMEA-4358,4359,4360
Fluorspar, Lead and Zinc
The New Jersey Zinc Company
Projects 1A, 1B, and 1C
Hardin County, Illinois

Gentlemen:

Your applications for aid for an exploration project and other reports available to us in Washington relating to the subject property have been reviewed.

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

Careful study of all our information indicates to us that the probability of disclosing significant reserves of fluorspar, lead and zinc is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your applications for exploration assistance are denied. We are cognizant of the U. S. Geological Survey classification of the lands in the Shawnee National Forest as mineral bearing but this in itself does not qualify them for DMEA assistance. Such denial, however, is made without prejudice to the property. However, if you do additional work on these properties of sufficient scope to obtain favorable information, we shall be pleased to consider new applications. In submitting a new application you should refer to the original application by docket number describing the work accomplished and the results achieved in detail.

We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention.

Sincerely yours,

C. O. Mittendorf

Administrator

LGHouk:gad 10/12/56
Copy to: Admr. R. File
Docket
Operating Committee
Field Team, Reg. V
Mr. Kiilsgaard, 5222
Mr. McDougal, 3522
Mr. Hopkins
Mr. Houk

Reviewed by
DMEA OPERATING COMMITTEE
10-15-56
(date)
R.C.K.

Docket Copy
Surname:

Houk
Ramb

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

The New Jersey Zinc Company
160 Front Street
New York 38, New York

Re: Docket Nos. DMEA-4358,4359,4360
Fluorspar, Lead and Zinc
New Jersey Zinc Company
Projects 1A, 1B, and 1C
Hardin County, Illinois

Gentlemen:

Your applications for aid for an exploration project and other reports available to us in Washington relating to the subject property have been reviewed.

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

Careful study of all our information indicates to us that the probability of disclosing significant reserves of fluorspar, lead and zinc is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your applications for exploration assistance are denied. Such denial, however, is made without prejudice to the property. In the event further work on your part discloses new and more favorable evidence of ore deposition on the property, we shall be pleased to consider a new application.

We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention.

Sincerely yours,

Administrator

LGHouk:gad 10/9/56
Copy to: Admr. R. File
Docket
Operating Committee
Field Team, Region V
Mr. Kiilsgaard, 5222
Mr. McDougal, 3522
Mr. Hopkins
Mr. Houk

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

October 10, 1956

Memorandum

To: Mr. C. O. Mittendorf

From: L. G. Houk

Dockets Nos. DMEA-4358,4359,4360
Fluorspar,Lead,and Zinc
New Jersey Zinc Company
Projects 1A, 1B, and 1C
Hardin County, Illinois

Subject: Evaluation of applications and field examination report.

Denial of applications is recommended.

The applicant's proposal presents no definite target but hopes by scattered drilling to find a commercial mineralization.

Applicant's proposal: The applicant proposes to diamond drill and churn drill three partially contiguous tracts in Hardin County, Illinois. The three applications are considered as a single project. The applicant proposes to explore 4,700 acres for $185,861.00.

A-Docket DMEA-4359 (2 stage project) Total cost $69,918. Approx.1,680 acres.
Stage I: 16 holes on approximately 660 centers for a total of 12,000 feet of drilling to test the structural relations between the Wolrab and the Goose Creek faults.
Stage II: Unspecified number of churn drill holes totaling 10,000 feet to test the favorable areas developed in Stage I.

B-Docket DMEA-4358 Approx. 2,060 acres. Estimated cost $70,093.
Churn drill 20,000 feet of holes on 660 foot pattern to prospect for bedded replacements between the Lee and Wolrab faults. Diamond drill unspecified number of holes totaling 3,500 to explore the Wolrab fault for vein type deposits.

C-Docket DMEA-4360 960 acres. Estimated Cost $45,850.
Diamond drill five holes on a 660 foot pattern for a total of 4,000 feet to explore for vein type deposits on the Lee structure and churn drill 9,000 feet of churn drilling on a widely spaced pattern to locate bedded replacement deposits.

The applicant holds the property under options to purchase from a large number of property owners. Prospecting permits have been applied for on parcels of Federal Re-Foreststation land. No consents to lien have been received. The prospecting permits have been denied and the land will be subject to competitive bidding.

Justification for denial:

The Field Team reports: "Several operating companies have done exploratory drilling in and near the subject area and have made the results available to the writers. None of the results were encouraging."

2. "Those areas to be explored for vein deposits contain only faults which have been relatively unproductive and about which little is known". The applicant does not appear to have any specific targets in mind but rather desires to blanket the area with drill holes with the hope of encountering commercial mineralization.

The New Jersey Zinc proposal is in the same general area and has the same general geology as DMEA-4284 (D.G.Gibson,Jr.) according to the Field Team. This application which is being held in abeyance until the applicant completes additional drilling for his own account, with the thought of qualifying for DMEA exploration.

Recommendations:

The examining engineers recommend denial of the subject application for the foregoing reasons. Mr. Laurence of the Field Team recommended the applicant submit the detailed geological map and additional justification. The applicant submitted the detailed geologic map requested by Mr. Laurence and in a letter from the New Jersey Zinc Geologist, Jack Hague, he points out that the Federal land upon which they requested a prospecting permit had been classified as mineral bearing. I do not think the fact that the land had been classified by the Conservation Division of the Survey as mineral bearing should qualify it for DMEA assistance.

The Bureau of Mines, Branch of Construction and Chemical Materials, on September 26, 1956, stated that the applicant should be requested to furnish additional information. Base Metals, Bureau of Mines, concurs.

The Geological Survey Commodity Member, on September 20, 1956, recommends that the geologic map be evaluated by the Field Team. In a telephone conversation with Mr. Trace, Field Examining Geologist, he indicated that he had knowledge of the detailed geologic map referred to and that he did not believe it added any new information. It is, therefore, recommended that the subject application be denied.

DOCKET COPY
Surname:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

Hopkins
Hoyt
Selfridge
Stephenson
Wittenberg

19 JUL 1956

Mr. Robert A. Laurence
Executive Officer, DMEA
Field Team, Region V
Room 13, Post Office Building
Knoxville, 2, Tennessee

Re: Docket Nos. DMEA-4358, 4359, 4360
Fluorspar, Lead, and Zinc
New Jersey Zinc Company
Projects 1A, 1B, and 1C
Hardin County, Illinois

Dear Mr. Laurence:

Please review the subject applications and arrange for a field examination if you deem it necessary.

Copies of memoranda dated July 2 and 16, 1956, by Mr. T. H. Kiilsgaard, USGS, and Mr. R. B. McDougal, USBM, respectively, relating to the projects are enclosed.

If exploration is recommended for each tract, we suggest that the projects be consolidated into one single proposal.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (JHB)

Approved:

P. F. Yopes (JHB)
Member, Bureau of Mines

Thor H. Kiilsgaard (JHB)
Member, Geological Survey

JHopkins:ms 7/16/56
Copy to: Docket(3)
Operating Committee
Mr. Kiilsgaard, 5222
Mr. McDougal, 3522
Mr. Houk(3)
Admr. R. File

Enclosures: 10

DOCKET COPY
Surname:

Hopkins
Houk

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

19 JUL 1956

The New Jersey Zinc Company
160 Front Street
New York, 38, N. Y.

Re: Docket Nos. DMEA-4358, 4359, 4360
Fluorspar, Lead and Zinc
New Jersey Zinc Company
Projects 1A, 1B, and 1C
Hardin County, Illinois

Gentlemen:

Your applications for assistance in exploring the subject properties have been reviewed by the Nonmetallic Minerals Division of the Defense Minerals Exploration Administration and have been referred to Mr. Robert A. Lawrence, Executive Officer, DMEA Field Team, Region V, Room 13, Post Office Building, Knoxville, 2, Tennessee, for further consideration.

If the Regional Office has not yet contacted you, it will do so at an early date with respect to further information and a field examination if deemed necessary.

Sincerely yours,

C. O. Mittendorf

Administrator

JHopkins/FJohnson:ms 7/18/56
Copy to: Docket(3)
Operating Committee
Field Team, Region V
Mr. Kiilsgaard, 5222
Mr. McDougal, 3522
Mr. Houk(3)
Admr. R. File

DOCKET COPY
Surname:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

The New Jersey Zinc Company
160 Front Street
New York, 38, N. Y.

Re: Docket Nos. DMEA-4358, 4359, 4360
Fluorspar, Lead and Zinc
New Jersey Zinc Company
Projects 1A, 1B, and 1C
Hardin County, Illinois

Gentlemen:

Your applications for assistance in exploring the subject properties have been reviewed by the Nonmetallic Minerals Division of the Defense Minerals Exploration Administration and have been referred to Mr. Robert A. Lawrence, Executive Officer, DMEA Field Team, Region V, Room 13, Post Office Building, Knoxville, 2, Tennessee, for further consideration and possibly a field examination.

The Regional Office will contact you at an early date if an examination is to be made. Any assistance you may give the members of the Field Team during the examination will be appreciated.

Sincerely yours,

Administrator

JHopkins:ms 7/16/56
Copy to: Docket(3)
Operating Committee
Field Team, Region V
Mr. Killagnard, 5222
Mr. McDougal, 3522
Mr. Houk(3)
Admr. R. File

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

RECEIVED
JUL 16 1956

July 16, 1956

Memorandum

To: Lawrence G. Houk, Chief, Non-Metallic Minerals Division, Defense Minerals Exploration Administration

From: Commodity Specialist, Branch of Construction and Chemical Materials

Subject: Review of Application DMEA Nos. 4358 and 4360, Projects 1-B and 1-C respectively, Fluorspar-Lead-Zinc, New Jersey Zinc Co., Hardin Co., Illinois, Estimated cost $70,093 and $45,850 respectively.

Subject applications have been reviewed and referral to the field team is recommended.

In Project 1-B, it is proposed by the applicant to diamond drill the area along the Wolrab fault with several holes - approximately 3,500 feet of drilling - to determine if vein-type mineralization exists in the fault. About 10,000 feet of churn drill holes are proposed for exploring the area along both sides of the fault, with an additional 10,000 feet if mineralization is found with the first drilling. The exploration aims at locating a replacement deposit in this area similar to those found south in the Cave-in-Rock district.

In Project 1-C, it is planned to explore the Lee fault with 5 diamond drill holes to test for vein type mineralization in the fault. Widely spaced churn drill holes (approximately 4,500 feet of drilling) are proposed to explore for replacement type deposits on both sides of Lee fault and to determine if Hamp fault continues across these properties to the Lee fault. An additional 4,500 feet of churn drilling may be necessary if the first drilling is successful in locating mineralization.

Earlier prospecting in this area was done at the Renfro Prospect and at the Lee mine to the north on the Lee fault. Traces of fluorite were reported at both prospects. The Bureau of Mines drilled 5 holes at the Lee mine in 1944, and the work is described in Report of Investigations 3996, January 1947. It is felt that Project 1-B will explore the Wolrab fault and the area between two previous prospects for replacements type deposits. Similarly, Project 1-C would explore the Lee fault and the possibility of a

replacement type deposit between the Lee mine to the east and the Hamp fault to the west. Production from a mineralized vein is known in the west portion of the Hamp fault, with some banded replacement ore having been reported.

The estimated drilling costs do not appear to be excessive.

These two projects have been combined for writing this report, as it is felt that they are very similar and appear to represent favorable areas for exploration to extend the fluorspar district.

Robert B. McDougal

Robert B. McDougal

~~Attachments (Applications)~~

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

July 3, 1956

Air Mail

Mr. Robert D. Trace
P. O. Box 305
Marion, Kentucky

Dear Bob:

Yesterday Bob Laurence informed me over the telephone that he had mailed to you the applications submitted by New Jersey Zinc to explore for fluorspar in Hardin County, Illinois. I think it was an excellent idea of Bob's to get those applications to you so that you could go over them with Harry Burmeister and perhaps with a New Jersey Zinc representative while Harry is out there on his trip; otherwise we would undoubtedly have to wait for Harry to make another trip back to Illinois which might be several weeks.

I have told Larry Houk that Bob had sent the applications to you and he is in agreement with this action. Larry said a field referral would be made as soon as he had received the commodity reviews of the Survey and the Bureau. With this thought in mind I am sending you the Survey review which I made with some help from Van Alstine. As you will see, the proposals look to me to be more prospecting than exploration but you are far better acquainted with the geology of that area than I am and perhaps I may be wrong in my views. In any event I don't mean to attempt to prejudice your mind by sending the review but merely to let you know how the applications appear to a party uninformed on the geology of that area.

If you need anything in the way of library information, etc., in the preparation of your report on these applications please let us know and we will send them to you.

Sincerely,

Thor H. Kiilsgaard
Staff Assistant for DMEA

Enclosure 1

cc: L. G. Houk, 4453

RECEIVED
JUL 5 - 1956

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

July 2, 1956

Memorandum

To: L. G. Houk, Defense Minerals Exploration Administration

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

Subject: Review of New Jersey Zinc applications to explore for fluorspar in Hardin County, Illinois, Projects 1-A, 1-B, and 1-C; Dockets 4359, 4358, and 4360, respectively.

INTRODUCTION

All three of the cited New Jersey Zinc applications are reviewed in this memorandum, such action being taken because the three proposed projects are in close proximity to each other, are in the same geologic environment, and have similar objectives. All three could have been combined into one application.

The proposed projects will explore for two types of fluorspar ore bodies: 1) veins of fluorspar along prominent faults, and 2) replacement bodies in favorable limestones. The area to be explored is a heretofore unproductive part of a productive fluorspar district. As shown on the applicant's geologic map, the area is roughly four miles west of the Cave-In-Rock replacement bodies of fluorspar but separated from that area by the Peter's Creek graben (see Geologic Map, The Fluorspar District of Southern Illinois, Bulletin No. 76, Illinois Geological Survey). Southwest of the area about seven miles lies the Rosiclare district, notable for its vein-type fluorspar deposits.

PROJECT 1-A (Docket 4359)

This project is to be the first work done of that proposed by the applicant. The work is to be in two stages, the first stage consisting of 12,000 feet of diamond drilling, the second stage to be 10,000 feet of churn drilling. Cost of the project is estimated at $69,918.00.

Stage I diamond drilling is to be done as rows of holes, the holes 660 feet apart. The purpose is to test the structural relations of the country between the Wolrab and Goose Creek faults. Stage II churn drilling is not shown on the map but would be laid out to test favorable areas found in Stage I work.

There are no fluorspar outcrops within the Project 1-A area. East of the area, in the southern part of section 17, the Goose Creek mine -- along the Goose Creek fault -- was described by Newman and Trace (DMEA Docket 3321) as having a 10,000 ton fluorspar ore body. Largely on the basis of this ore body, Newman and Trace recommended approval for DMEA exploration on the Thurston Patton tract in section 16 northeast of the Goose Creek mine but along the Goose Creek fault. This contract was terminated before completion, presumably because the holes that were drilled failed to find significant amounts of fluorspar. While there may be other mineralized faults in the area none are shown on either the applicant's map nor the Illinois Survey map; hence the chance of finding a vein-type deposit must be considered as remote. This remoteness is emphasized by the absence of fluorspar float -- the so-called gravel spar of that area. Elsewhere in the district, gravel spar, because of its insolubility and resistance to erosion, has been found overlying or near to vein-type deposits.

The applicant's proposal to drill the area for replacement deposits in the underlying limestone is speculation based on geologic similarity with Cave-In-Rock deposits. It should be noted, however, that to date no workable replacement bodies of the Cave-In-Rock type have been reported west of the Peter's Creek graben.

Conclusions

The proposed work is prospecting and as such does not warrant DMEA assistance. The applicant should initiate the program at his own expense and find targets worthy of exploration. With such targets in hand and with definite proposed drilling programs DMEA assistance might be justified. As it is, the proposed work is simply blind drilling in an unproductive area with no outcrops and with a dearth of supporting geologic evidence. The only supporting feature is that favorable limestones underlie the area, but this may be said of a good part of Illinois and surrounding states.

PROJECT 1-B (Docket 4358)

This proposal consists of 3,500 feet of diamond drilling and 10,000 feet of churn drilling, to be followed by an additional 10,000 feet of churn drilling if initial drilling results prove favorable. Cost of the project is estimated at $70,093.00.

From a geologic standpoint this project would appear to be more justifiable than Project 1-A. In the central part of the project area there is the Renfro prospect, described in the Illinois Survey bulletin as having been explored by a 22-foot shaft, and showing weathered gravel spar and bedding replacement by fluorspar. The Fredonia limestone, the district's more favorable limestone for replacement ore bodies, also crops out around the Renfro prospect. As the rocks have relatively flat dips, the Fredonia limestone could be tested some distances away from the prospect with shallow churn drill holes.

A short distance northwest of the project, in the northwest corner of section 14, a fluorspar vein deposit was formerly mined from along the Lee fault, the westernmost of the faults shown on the applicant's map. This property was subsequently diamond drilled by the U. S. Bureau of Mines; the results of their work are described in R. I. 3996. During the period the Lee mine was active it produced about 14,000 tons of fluorspar concentrate. Bureau drilling, however, gave discouraging results, as did earlier drilling on the property by U. S. Steel Company. The Lee fault is west of the project area and would not be tested by any of the proposed drilling; however, it is described as a complex shear zone and perhaps strands of it may pass into the project area.

The Wolrab fault crosses the eastern side of the project area; the proposed diamond drilling is to test this structure. The fault is described as a complex fault, more as a zone of shearing than a simple fracture. No outcrops of fluorspar or gravel spar are reported along its outcrop.

Conclusions

From the information submitted the Project 1-B area would appear to warrant DMEA assistance more than Project 1-A. This would be particularly so if the fluorspar outcrop at the Renfro prospect proved to be a replacement deposit of the type that could be extensive. Diamond drilling along the Wolrab fault would appear to be prospecting.

PROJECT 1-C (Docket 4360)

Exploration work in this project consists of 4,000 feet of diamond drilling and 9,000 feet of churn drilling, the cost of which is estimated at $45,850.00. The chief exploration target is the Lee fault, which is to be tested by diamond drilling; the churn drilling is for the underlying limestone.

As described under Project 1-B, the Lee mine produced about 14,000 tons of fluorspar concentrate, but it was drilled with five holes by the Bureau of Mines after it ceased to be productive and all holes were discouraging. Furthermore, the Bureau R I report mentions that previous to the Bureau drilling the Lee property and other optioned properties were tested by 18 diamond drill holes put down by U. S. Steel Company. The results of the latter drilling are not known but could not have been too good, otherwise U. S. Steel would have held on to the property rather than let it go as they did.

From the geologic map in Illinois Survey Bulletin 76, the Hamp mine is seen to be about 2 miles west of the westernmost property held by the applicant in area 1-C. The Hamp fault extends eastward from the mine but apparently weakens to the point where it cannot be accurately plotted in area 1-C. Production from the Hamp mine is not known, but from the description in bulletin 76 it must be small.

Conclusions

On the basis of work done to date along the Lee fault, the applicant's proposed diamond drilling of the fault would not be warranted. Perhaps the applicant could do some work along the fault on his own account, and if this disproved the negative results of earlier work and established a definite target, some DMEA assistance might be warranted. The proposed churn drilling appears to be entirely prospecting.

RECOMMENDATIONS

I recommend that all three applications be sent to the field for further review. To expedite the processing of the applications and simplify field review, it is suggested that the Field Team prepare one report to cover all three applications. Unless field reviewers produce adequate reasons to support the applicant's proposals it would seem to me that Projects 1-A and 1-C should be denied, with a possible more limited program approved for Project 1-B.

Thor H. Kilsgaard

Thor H. Kilsgaard

THE NEW JERSEY ZINC COMPANY
(ESTABLISHED 1848)
100 FRONT STREET
NEW YORK 38, N.Y.

RECEIVED
JUN 26 1956

HORSE HEAD PRODUCTS ®

OFFICE OF THE
VICE PRESIDENT

June 25, 1956

Defense Minerals Exploration Administration
U. S. Department of the Interior
Washington 25, D. C.

D.M.E.A. Exploration Project 1-C
Hardin County, Illinois
The New Jersey Zinc Company

Gentlemen:

Submitted herewith by The New Jersey Zinc Company is an application for aid in an exploration project in Hardin County, Illinois. Form MF-103 has been prepared in quadruplicate pursuant to D.M.E.A. Order 1, under the Defense Production Act of 1950, as amended.

This is one of three projects in Hardin County for which we are making applications. We would prefer to drill these projects in the following sequence: 1-A, 1-B, and 1-C. Item 5-C in each application indicates the order of work; but since more than one prospecting drill will be in service, the three projects may overlap to some extent.

Pending your acceptance of these projects, we are ready to proceed within a few weeks after the contract is received.

Very truly yours,

S. S. Goodwin
Vice President

SSGei

For attachments see following page.

RECEIVED
JUN 2 6 1956

ATTACHMENTS

Form MF-103

Sheet #1 - Corporation officers

Sheet #2 - List of Options

Sheet #3 - Applicant's Property rights

Sheet #4 - Physical description

Sheet #5 - Description of the Exploration Project

Sheet #6 - Estimated Costs

Exhibit C for 1-C -- Agreements with property owners

Map AX-Ill-17 Project Map

AX-Ill-18 Geologic Map

AX-Ill-12 Stratigraphic Section

Exhibit D - Copies of Proposals by contract drillers

(3)

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

RECEIVED
JUN 26 1956

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

Not to be filled in by applicant

Docket No. 4360
Metal or Mineral Fluorspar-Lead-Zinc
Date Received 6/26/56
Estimated Cost $45,850.00
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: The New Jersey Zinc Company, 160 Front Street, New York 38, New York. A New Jersey Corporation.

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

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

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

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

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

(*b*) State any mine name by which the property is known. See sheet 3 attached.

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise See sheet 3 attached.

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

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

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

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

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. See sheet 4.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you. See sheet 4 attached.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. See sheet 4 attached.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power. See sheet 4 attached.

16—66551-1

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore This project will explore for fluorspar, lead and zinc ore.

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc. See sheet 5 attached.

(*c*) The work will start within ..... days and be completed within ..... months from the date of an exploration project contract. See sheet 5 attached.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See sheet 5 attached.

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

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

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

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

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

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

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

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

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

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs. See sheet 6 attached.

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

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

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated 25 June, 1956

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y.
(Applicant)

By J. B. Goodwin
VICE PRESIDENT

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

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

SHEET 1

RECEIVED
JUN 26 1956

1. (c.)

Names, Titles, and Addresses of Officers

Mr. R. L. McCann, President	160 Front Street, New York 38, N. Y.
Mr. C. Howard George, Executive Vice President	"
Mr. S. S. Goodwin, Vice President	"
Mr. Walter R. Anyan, Secretary	"
Mr. E. E. Schwegler, Comptroller	"
Mr. Samuel Riker, Treasurer	"
Mr. R. G. Kenly, Vice President	"
Mr. F. H. Baxter, Vice President	"
Mr. L. F. Johnson, Vice President	"
Mr. P. M. Ginder, Vice President	"
Mr. R. A. Oberfell, Assistant Secretary	"
Mr. W. L. Brookfield, Assistant Secretary	"
Mr. W. W. Gamwell, Assistant Treasurer	"

COMPANY
160 FRONT ST., NEW YORK 38, N. Y.

SHEET 2

3. (a.) The land in Project 1-C consists of a group of properties shown in red outline on Maps AX-111-17 and AX-111-18. The legal description of each tract is included in the agreement under which the property has been optioned by the Company. A copy of the recorded short form for each of these agreements is attached to this application as Exhibit C.

	Name of Property Owner	Acreage	Date of Expiration of Option
	Esdon Patton	160	12/9/63
	James W. Banks	160	12/12/63
	Lolene Bailey, et. al. (3/4 Interest)	120	2/9/59
*	John Pyle	80	3/11/64
	W. V. Moore	340	1/11/59
*	W. M. Hale, et al.	60	3/20/64
*	W. M. Hale, et al.	80	10/30/64
	Alvin Hale (1/4 interest Lolene Bailey)	--	3/9/61

* The mineral title in portions of the property may be in third parties; and, therefore, no part of the drilling program will be performed on such tracts.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y.

S H E E T 3

3. (b.) No mine is known to exist on the property under option. About one-half mile northeast of the W. V. Moore property, the Lee mine is found in the NW$\frac{1}{4}$ NW$\frac{1}{4}$ of Section 14.

(c.) The New Jersey Zinc Company holds options for the purchase of mineral and mining rights on each of the properties listed on Sheet 2 and has limited rights to purchase surface.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y.

4. (a.) No mines are known to exist on the properties under option. The Lee mine in the NW¼ NW¼ Section 14 has produced a small tonnage of fluorspar from an eight foot vein along the Lee fault. The Bureau of Mines drilled five holes to test the property in 1944. Their exploration work is described in Bureau of Mines Report of Investigations 3996, January, 1947.

(b.) No past production is known for the properties in the project. The Lee mine is reported to have produced 14,000 tons of fluorspar concentrates.

(c.) Project 1-C lies in the northern part of the Southern Illinois fluorspar district, northwest of Project 1-B. The local geology is shown on map AX-Ill-18. A stratigraphic section is shown in drawing AX-Ill-12.

Fluorspar mineralization in the vein type of deposit may exist along the Lee fault. The five proposed diamond drill holes are designed to test this possibility. Northeast of the Moore property, prospecting by the Bureau of Mines has shown the fault to be mineralized, but not of ore grade.

Replacement deposits similar to those found in the Cave-in-Rock district commonly occur in the Downey's Bluff limestone at the base of the Bethel sandstone, or in the Fredonia limestone beneath the Rosiclare. Such deposits may be localized along structures parallel to the Lee fault.

West of the map area, the Hamp fault contains a vein type fluorspar mine now being operated by the Aluminum Company of America.

(d.) The project is located seven miles north of Elizabethtown. The nearest railroad shipping point is Rosiclare, three miles southwest of Elizabethtown. A paved road runs into Karbers Ridge, which is a small village one-half mile north of the project. Other local roads are gravel and passable most of the year. The major sources of supply for the area are Rosiclare and Harrisburg, Illinois. Harrisburg is about twenty-five miles northwest of the project. The nearest residential areas are Rosiclare, Cave-in-Rock and Elizabethtown.

(e.) Ample man-power, materials, supplies, equipment, water and power are available in Hardin County.

5. (b.) The New Jersey Zinc Company proposes to explore the property covered by this project by means of diamond drilling and churn drilling. Diamond drill holes will be used to test for vein type mineralization in the Lee fault. Five holes are proposed to test the fault on the Bailey, Hale and Moore properties, as shown on Map AX-Ill-17.

Churn drill holes spaced 660' apart, in rows 2640' apart, are proposed to test for structures parallel to the Lee fault, which may contain bedding replacement type deposits. Locations for these holes are shown on Map AX-Ill-17. Information gained from churn drill holes should show whether or not the Hamp fault continues eastward across the Banks and Bailey properties to a junction with the Lee Fault.

Project 1-C will require about 4000' of diamond drilling and about 4500 feet of wide-spaced churn drilling. Another 4500 feet of churn drilling should be allowed for following up favorable mineralization found in the early holes. However, it is not the purpose of this project to outline individual ore bodies completely.

Drilling on Project 1-C is planned to start after the work in Project 1-A and 1-B has been largely completed. That is, the same equipment used in Projects 1-A and 1-B will be moved over for Project 1-C.

(c.) The work will start within 200 days after the contract is received, and be completed within twenty-four months of the expiration of the contract. The starting date for Project 1-C will depend on the rate of advance in Projects 1-A and 1-B. However, it is planned to complete all three projects within twenty-four months.

(d.) The New Jersey Zinc Company has had long experience in developing mineralization of this general type in Virginia and Tennessee. A program similar to the one proposed is now under way in southwest Wisconsin. This Illinois project will be under the general supervision of Mr. W. H. Callahan, Manager of Exploration, and under the direct supervision of John M. Hague, Resident Geologist, at Platteville, Wisconsin.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N.Y.

S H E E T 6

Estimated Costs

a.	Independent Contracts		
	Diamond Drilling		
	4,000 feet at $2.65/foot	$10,600	
	Churn Drilling		
	9,000 feet at $2.25/foot	20,250	
			$30,850
b.	Labor, Supervision, Consultants		
	Supervision:		
	1 geologist, half time for 8 mos.	2,500	
	1 geologist, full time for 8 mos.	4,000	
	Technical Services:		
	2 Surveyors, half time for 8 mos.	3,500	
	Accounting and secretarial salary charge $37.50/mo. for 8 mos.	300	
			$10,300
c.	Operating Materials and Supplies		
	Core boxes	250	
	Cuttings storage supplies	200	
	Office equipment 1/3 x 1050	350	
	Surveying instruments & supplies 1/3 x 1200	400	
			$1,200
d.	Operating Equipment		
	Automobile Expense 10,000 miles @ 8¢		800
e.	Rehabilitation and Repairs		
	None		
f.	New Buildings, Improvements		
	Core shed 1/3 x 4500		1,500
g.	Miscellaneous		
	Chemical Assays 100 at $6.00	600	
	Workmen's Compensation 1% x 10,000	100	
	Insurance, Payroll Taxes 5% x 10,000	500	
			$1,200
			$45,850

INDUSTRIAL
AND
ANALYTICAL
CHEMISTS

The Bruce Williams Laboratories

ESTABLISHED 1898

MAIN OFFICE: 618-622 JOPLIN STREET
TELEPHONE MAYFAIR 3-1556

Joplin, Missouri

ENGINEERING
INSPECTIONS
AND
TESTS

BRANCH OFFICES

306 VALLEY DRIVE
ST. LOUIS, MISSOURI
TELEPHONE HOBART 7-3226

219 TERMINAL WAREHOUSE BLDG.
LITTLE ROCK, ARKANSAS
TELEPHONE FRANKLIN 2-0693

CONNELL HOTEL BLDG.
PICHER, OKLAHOMA
TELEPHONE 710

RECEIVED
JUN 26 1956

April 28, 1956

The New Jersey Zinc Company
P. O. Box 217
Platteville, Wisconsin

Attention: John H. Hagae

Gentlemen:

Thank you for your inquiry of April 23rd.

Our charge for determinations on fluorspar are as follows:

Lead - $1.50 Zinc - $1.50 and Fluorspar - $3.00

We would be very pleased to represent you on any tests or analysis on fluorspar or other materials.

We are representing the General Services Administration on fluorspar shipments that they are now buying from Southern Illinois. We also did the original work on drilling campaign of the Ozark Mahoning Company and the Minerva Oil Company when they opened up those fields. We are very familiar with fluorspar analyses.

Very truly yours,

THE BRUCE WILLIAMS LABORATORIES

Bruce Williams

Bruce Williams

BW-jc

P. S. -- This is a personal invitation for you to visit our main laboratories in Joplin, Missouri and --- "See for Yourself"

THE NEW JERSEY ZINC COMPANY
160 FRONT ST. NEW YORK 38, N. Y.

June 27, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region V

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region V.

DMEA - 4360 New Jersey Zinc Company

Robert E. Adams
Chief, Operation's Control
and Statistics Division

June 27, 1956

New Jersey Zinc Company
160 Front Street
New York 38, N. Y.

Subject: DMEA 4360
Re: Exploration Assistance

Gentlemen

The receipt of your application dated June 25, 1956 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA 4360 and referred to the Nonmetallic Mineral Division.

Kindly identify all future correspondence relating to your application by this docket number.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

60932

EXHIBIT D

Copies of Proposals by Contract Drillers

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y.

Office Phone 476

P. O. Box 296

Wm. Taylor Drilling Company

Marion, Kentucky

May 8, 1956

RECEIVED
JUN 26 1956

New Jersey Zinc Company
160 Front Street
New York 38, New York

Attention: A. E. Turner

Churn Drilling - Hardin County, Illinois, 1-AX-524

Dear Sir:

The information furnished below is in regard to the above captioned drilling:

Q.1. What portion of the program the bidder is bidding for and the date he can start drilling?
A. I would like to bid on the proposed 20000feet of churn drilling. I can start drilling in the next six weeks.

Q.2. Type of rig to be used on the job?
A. 24 Bucyrus drill rig.

Q.3. Price per foot of drilling?
A. $3.00 per foot. (any time unprofitable drilling is encountered I want a $5.00 per hour guarantee, due to the lack of information, and bad drilling experience in this area.)

Q.4. Hourly rate for time spent surveying, casing holes at Company's request, or other specified tasks not covered by the footage rate?
A. Hourly rate will be $8.00 per hour.

Q.5. Type of Insurance carried by bidder?
A. -Bituminous Casualty Corporation - Bodily Injury $25,000.00 and $50,000.00 (application has been made to raise this to $50,000.00 and $100,000.00) Property Damage $10,000.00 and $25,000.00 (application has been made to raise this to $25,000.00 and $50,000.00)
-Continental Casualty Company - Workman's Compensation - Policy ISP-1924773
-State Automobile Mutual Insurance Company - Fleet Policy #1907802 (cars, trucks)

Q.6. Experience of bidder?
A. Contracting in all types of oil field and mining prospect work since 1937. From 24" holes down, with 4000 foot depth. States of Kansas, Missouri, Illinois, Indiana, and Kentucky.

Q.7. Two references for whom bidder has done drilling, and one credit reference?
A. Minerva Oil Company, Ozark Mahoning Company, and Alcoa Mining Company. Credit Reference, The Peoples Bank, Marion, Kentucky.

WM. TAYLOR DRILLING COMPANY

Don Taylor

Donald Taylor

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y.

MOORE & SIEGAL

GENERAL CONTRACTORS

EXCAVATING
EARTHMOVING
SEWER, WATER
TRENCHING
CEMENT WORK
WELL DRILLING

PHONE 6661

SHULLSBURG, WISCONSIN
May 17, 1956

The New Jersey Zinc Company
160 Front Street
New York 38, New York

[redacted]

Attention: Mr. A. E. Turner,
Assistant Manager of Purchasing

Re: Diamond Drilling and Churn Drilling -
Hardin County, Illinois
1 - AI - 524.

Gentlemen:

After careful study of your letter and attached specifications for the above drilling program in Hardin County, Illinois, dated March 27, 1956, we submit hereunder our bid proposal for such drilling and other information as requested in your specifications. Our bid proposal is confined to the churn drilling part of the above program.

BID PROPOSAL

We do hereby bid and propose as follows on your diamond and churn drilling program for Hardin County, Illinois (1-AI-524), all to be done and performed in accordance with terms and requirements of New Jersey Zinc Company specifications, as contained with your letter of March 27, 1956:

1. Portion of Program Bid and Starting Date. We enter our bid for the churn drilling portion only of the program outlined in your specifications; for the minimum of 20,000 feet of churn drilling, or more as desired, and with one or two, or more, churn drill machines, as required.

   We could commence such churn drilling operations at any time within ten (10) days after awarding of contract, at the requested date by your company.

2. Type of Drill Rigs to be Used on job. Type of churn drill rigs to be used are Bucyrus-Erie, Model 22-W and one Sanderson-Cyclone, ST-44, truck mounted or trailer mounted.

3. Price per Foot of Drilling. We bid and propose to perform said churn drilling at the straight price of two and 25/100 ($2.25) Dollars per foot of drilling.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N.

4. Hourly Rate For Time Surveying, Casing Holes, or Other Specified Tasks, etc. The only additional or extra charge for work customarily or normally included in churn drilling operation would be for casing left in holes at company's request at the bidder's current cost of such casing and plugs. Any other extra ordinary or specified tasks at such price or rate as mutually agreed upon with company.

5. Type and Amount of Public Liability and Property Damage Insurance of Bidder. This information is covered and provided in your files under our other current drilling contracts with your company.

6. and 7. Experience and References. In view of our drilling record and work for your company in the Southwestern Wisconsin area during the past four years, we assume that no further information is necessary on these points.

The above and foregoing bid proposal is made in accordance with your company's specifications as herein referred to, and all terms and conditions of said specifications are understood and assumed to be part of this bid proposal, and are hereby incorperated as part thereof.

Dated this 17th day of May, 1956.

Respectfully Submitted,

MOORE & SIEGAL

By: Eddie Siegal

Eddie Siegal, Partner

THE NEW JERSEY ZINC COMPANY
30 FRONT ST., NEW YORK 38, N. Y.

CLARK DRILLING COMPANY

301 EAST COLLEGE

Fredericktown, Missouri

April 21,1956.

ACT

RECEIVED
JUN 26 1956

The New Jersey Zinc Company,
160 Front Street,New York 38,N.Y.
Mr.A.E.Turner,Assistant Manager of Purchasing

Gentlemen: Bid for Churn Drilling only,Hardin County,Illinois

1. This bid is for churn drilling only.
   If I am the successful bidder I agree to start drilling within five (5) days of notification.
2. I will use late model Bucyrus-Erie rigs.I have (1) Model 24L Machine and (3) Model 22W Machines
   These rigs are all truck mounted and are all in good condition.

3. Prices per foot on sliding depth scale:
   For the first 500 feet ---------- $ 2.20 per foot
   From 500 feet to 1000 feet ---------- $ 2.35 per foot
   From 1000 feet to 1100 feet ---------- $ 2.50 per foot
4. Hourly work rate for specified work designated by the company and not covered by footage price will be $ 6.00 per hour.
5. Certificate of public liability and other insurance enclosed.
6. I have owned and operated churn drills since 1934,most of my work has been drilling test holes for various mining companies,with quite a lot of the work more than 1000 feet in depth.
7. Drilling references:
   The Minerva Oil Company,Fluorspar mining division near Cave-in-Rock,Illinois
   The National Lead Company,St.Louis Smelting and Refining Division,Fredericktown Mo.
   The American Metals Company of New York, work did near Potosi Mo.

Credit reference:
The Bucyrus-Erie Company
South Milwaukee Wisconsin

Bidder: Clark Drilling Company
Fredericktown Mo.

Signed Glen E. Clark

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y.

JOY MANUFACTURING COMPANY
800 WOODLAND AVENUE
MICHIGAN CITY, INDIANA
TELEPHONE 7-7231

EXECUTIVE OFFICES
HENRY W. OLIVER BUILDING
PITTSBURGH 22, PA.

April 25, 1956

AIR MAIL

The New Jersey Zinc Company
160 Front St.
New York 38, N. Y.

Attention: Mr. A. E. Turner
Asst. Manager of Purchasing

Subject: Diamond Drilling
Hardin County, Ill. - 1-X52k

Gentlemen:

This will acknowledge receipt of your letter dated March 27th requesting prices on Diamond Core and Churn Drilling in Hardin County, Illinois.

Since we do not have any churn drilling equipment in our contract service, we cannot quote prices on the churn drilling, but we are interested in the proposed diamond core drilling and are quoting prices on that particular type of drilling.

Minimum 12,000 feet of drilling

	BX Core	AX Core
From 0. to 600. ft.	$2.90 ft.	$2.65 ft.
From 600. to 1200. ft.	3.15 "	2.90 "

Above prices based on our furnishing water up to one mile.

	BX Core	AX Core
From 0. to 600. ft.	$3.15 ft.	$2.90 ft.
From 600. to 1200. ft.	3.40 "	3.15 "

Above prices based on our furnishing water in excess of one mile.

BX Casing left in holes at your request	$1.96 ft.
AX Casing left in holes at your request	$1.54 "
Surveying drill holes, acid test, if any	$7.50 per hr.
Capping drill holes, etc.	$4.50 per hr.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38

If it is your desire to save cores of the drilling, then it will be necessary that you furnish the proper containers for same.

We will furnish for this proposed drilling one of our gasoline driven core drills complete with operating equipment, and can start the work to meet your schedule.

We will appreciate an early decision concerning the above proposition so that we can schedule the work accordingly.

Yours very truly,

JOY MANUFACTURING COMPANY

W. J. Pilarski, Mgr.
Contract Drill Division

WJP/et

MANUFACTURERS OF
DIAMOND DRILLS
DRILLING EQUIPMENT
DIAMOND BITS

BRANCH OFFICES
NEW YORK · PITTSBURGH
PHILADELPHIA
GRAND JUNCTION, COLO.

EXECUTIVE OFFICES & PLANT
221 W. OLIVE STREET
SCRANTON, PA.

SINCE 1863

SPRAGUE & HENWOOD, INC.

CONTRACTORS FOR
DIAMOND DRILLING
SHOT DRILLING · SOIL SAMPLING · PRESSURE GROUTING
WATER WELLS & CHURN DRILLING

RECEIVED
JUN 8 6 1956

MAIL ADDRESS · P. O. BOX 446
SCRANTON 2, PA.
DIAMOND 4-8507

May 1, 1956

RE:- Diamond Drilling
Hardin County, Illinois
1-AX-524

The New Jersey Zinc Company
160 Front Street,
New York 38, New York

Attention:- Mr. A. E. Turner,
Assistant Manager of Purchasing

Gentlemen:-

As requested in your letter of March 26th we are pleased to quote you on diamond drilling in the area south of Karbers Ridge and Sparks Hill, Hardin County, Illinois about seven miles north of Elizabethtown.

Our quotation is based on drilling a minimum of 12,000 feet of diamond drilling, holes in depths from 200 feet to 1,200 feet, mostly vertical, but some may be angle and we are pleased to quote you as follows:-

ITEM NO.

1 - Diamond Drilling AX holes -

0'	to	500'	-	$ 2.25 per lin.ft.
500'	to	750'	-	$ 2.50 per lin.ft.
750'	to	1000'	-	$ 3.00 per lin.ft.
1000'	to	1250'	-	$ 3.75 per lin.ft.

2 - Reaming and casing holes -

Reaming AX to BX and inserting
AX casing --- $ 1.00 per lin.ft.

3 - Casing lost in holes or left in holes by your request

AX casing --- $ 1.54 per lin.ft.

4 - Surveying holes or delays - for use of drill crew,
surveying holes or delays caused by you - $ 12.00 per hour.

5 - Cementing holes -

For cementing holes, waiting for cement
to set, drilling out cement - $ 12.00 per hour,
plus cost of cement

We are quoting you only on the portion of your inquiry covering diamond drilling.

We have a Sprague & Henwood type 142 skid mounted diamond drill rig. We have the necessary equipment and experienced personnel available to take care of this work.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38

To:-
The New Jersey Zinc Company
Att:- Mr. A. E. Turner,
Assistant Manager of Purchasing

5/2/56

Payments to be made monthly within 30 days after date of our invoice.

We trust you will find this quotation acceptable.

We wish to thank you for the opportunity of quoting on this work.

Very truly yours,

SPRAGUE & HERWOOD, INC.,

Wm. J. Schenk,
Vice President

WJS:GT
In Triplicate

Longyear

E. J. LONGYEAR COMPANY
General Offices, Foshay Tower
Minneapolis 2, Minnesota, U.S.A.
TELEPHONE: FEDERAL 2-2447 • CABLE LONGCO

May 11, 1956

JUN 28 1956

The New Jersey Zinc Company
160 Front Street
New York 38, New York

Attention: Mr. A. E. Turner
Assistant Manager of Purchasing

Gentlemen:

Diamond Core Drilling -
Hardin County, Illinois - 1-AX-524

1. Pursuant to Mr. Blair's recent conversation with Mr. J. M. Hague, and your letter of March 27th, we are pleased to submit below proposal for your contemplated exploratory drilling program which is to be carried out in the above-described area.

2. We understand that the program as now planned will consist of a series of both vertical and angle holes with a minimum inclination of 60 degrees measured from the horizontal, ranging up to a maximum of 1500 feet in depth, with a minimum aggregate footage of 12,000 feet; that the materials to be drilled will consist of any one or possibly all of the following: nearly horizontally-bedded, moderately-soft sandstones, limestones, and shales; that the water required for drilling operations is available from streams which traverse the area. We further understand that the terrain is gentle, rolling; and that most of the sites will be accessible by truck.

3. For this work we propose to furnish one complete Longyear truck-mounted diamond core drill, together with the necessary accessory and service equipment required to complete the work as now planned. We further propose to operate the drill either on a one or two shift basis, depending upon the availability of competent drill operators.

4. We will carry public liability insurance covering personal injury and property damage, and Workmen's Compensation insurance, and also, all-risk insurance on the drilling equipment protecting against loss by theft, fire, flood, land-slides and other similar hazards.

We will also assume and pay any and all Old Age Benefit, Unemployment and Social Security taxes and contributions imposed by federal or state authorities.

Certificates showing the coverage referred to will be furnished upon request.

5. Based upon the conditions as outlined above, we are pleased to quote as follows:

a) Overburden Drilling

0 to 100 feet in depth, measured from the collar of the hole.....$2.550 per foot

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y.

The New Jersey Zinc Company

May 11, 1956

b) Diamond Core Drilling

Top of Bedrock to 1000 feet (measured from the collar of the hole)

AX-size, recovering core approximately 1-1/8" in diameter.....$2.65 per foot

BX wire line, recovering core approximately 1-1/8" in diameter.....$2.55 per foot

BX-size, standard tools, recovering core approximately 1-5/8" in diameter.....$2.85 per foot

NX-size, recovering core approximately 2-1/8" in diameter (to be confined to collaring of holes)...$3.25 per foot

1,000 feet to 1500 feet in depth (measured from the collar of the hole) -

AX-size .....$2.85 per foot
BX wire line.....$2.75 per foot.

c) Drill Hole Inclination Tests.....$7.00 per hour.

d) Cementing, waiting for cement to set and drilling out cement.....$7.00 per hour

e) Lumnite Cement.....$3.50 per bag

f) Delays for your convenience or for which You are responsible.....$7.00 per hour.

6. All casing left in the drill holes at the request of the New Jersey Zinc Company, will be charged at current retail list prices.

7. Reaming and casing will be carried out at the sole expense of the Longyear Company,

8. Cores will be turned over to your representative at the drill site in receptacles furnished by you.

9. Statements covering the work performed will be rendered as promptly as possible after the first of each month.

10. We are very pleased to have the opportunity to make our services available for this work. As Mr. Blair has already discussed with Mr. Hague, if our proposal is found acceptable, we are prepared to commence the operations sometime in July or August.

Very truly yours,

E. J. LONGYEAR COMPANY

V. M. Burkhart
Operations Manager

ACCEPTED:

THE NEW JERSEY ZINC COMPANY

By: _____

Date: _____

JCCB:bal

THE NEW JERSEY ZINC COMPAN
60 FRONT ST., NEW YORK 38, N

EXHIBIT C

Agreements with Property Owners

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y

6-ACD- 2A

THIS AGREEMENT made and entered into on this 9th day of December, 1953, by and between Esdon Patton and Vada Patton, his wife Route 4, Harrisburg, Illinois, hereinafter called the Owners, parties of the first part, and THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, authorized to do business in the State of Illinois, party of the second part, hereinafter called the Company:

W I T N E S S E T H :

That for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable considerations in hand paid, the receipt of which is hereby acknowledged, Owners lease to the Company for a period of two years from the date hereof, with the privilege of extension for further one year periods thereafter, upon payment of sums of money agreed upon, the exclusive right to prospect for, explore and examine, mine or remove, process and store all the minerals, mineral substances, metals, ores, ore-bearing materials and rock of every kind in, under or on all of the following described premises:

The South One-half (S½) of the South West Quarter (SW¼) of Section 9, and the North East Fourth (NE¼) of the North West Quarter (NW¼) and the North West Fourth (NW¼) of the North East Quarter (NE¼) of Section 16; all the above land being in Township 11 South, Range 8 East of the Third Principal Meridian, in Hardin County, Illinois, and containing 160 acres, more or less.

together with the right to enter thereon, to use available water and to remove samples, in accordance with the terms of a LEASE AND OPTION AGREEMENT of even date herewith entered into between the parties hereto. Also for and in the same consideration the Owners grant to the Company the option to purchase, at any time during the life of the aforesaid lease up to December 9, 1963, all the E P minerals, mineral substances, metals, ores, ore-bearing materials, V P and rock of every kind, in, under or on the above described premises together with the right to prospect for, mine or remove, process or store the same, water rights, the right of ingress and egress, and the right to purchase surface acreage, all in accordance with the terms of the said LEASE AND OPTION AGREEMENT of even date herewith. The terms of this agreement are fully set out in said LEASE AND OPTION AGREEMENT, which is here referred to and made a part hereof as if fully set out at length.

The term "parties of the first part" as herein used shall be construed to mean, "the parties of the first part, their heirs, assigns and successors in title howsoever such succession may be accomplished" and the term "party of the second part" shall be construed to mean "party of the second part, its assignees, designees and successors in title howsoever such succession may be accomplished."

IN WITNESS WHEREOF the parties of the first part have hereunto set their hands and seals the day and year first above written.

Esdon Patton (Seal)

Vada Patton (Seal)

Approved as to form
JBC

ATTEST:

Walter R. Amyan
its Secretary

THE NEW JERSEY ZINC COMPANY

By
its Vice President

STATE OF ILLINOIS)
) SS:
COUNTY OF Hardin)

I, Gordon F. Pennell, a Notary Public in and for said County, in the State aforesaid, do hereby certify that ~~Eddon Patton and Vada Patton, his wife~~

personally known to me to be the same person, whose name are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 9th day of December, 1953.

Gordon F. Pennell
Notary Public

Commission expires April 30, 1957

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

I, John T. Hourigan, a Notary Public; do hereby certify that C. H. George to me personally known to be the Vice President of THE NEW JERSEY ZINC COMPANY, a New Jersey Corporation, and Walter R. Anyan, personally known to me to be the Secretary of said Corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement, appeared before me this day in person and severally acknowledged that they signed, sealed and delivered the said instrument as such Vice President and Secretary respectively, and caused the Corporate Seal to be affixed thereto, pursuant to authority given by the Board of Directors of said Corporation, as their free and voluntary act and as the free and voluntary act and deed of said Corporation, for the use and purposes therein set forth.

Given under my hand and notarial seal this 15th day of December, 1953.

John T. Hourigan
Notary Public
JOHN T. HOURIGAN
Notary Public, State of New York
No. 30-6977000
Qualified in Nassau County
Certificates filed with New York
County Clerk and Register
Commission expires March 30, 1954

STATE OF ILLINOIS, }
Hardin County } ss.

No. 1046

This instrument was filed for record in the Recorder's Office of Hardin County aforesaid, on the 22nd day of December A. D. 1953 at 11:00 o'clock A. M., and recorded in Book 5 of Misc. on page 9

L. H. Henry
Recorder

Recording Fee

6-ACD-74

THIS AGREEMENT made and entered into on this 12 day of December, 1953, by and between James W. Banks and Mary Margaret Banks, of R.F.D. # 3, Elizabethtown, Illinois,

hereinafter called the Owners, parties of the first part, and THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, authorized to do business in the State of Illinois, party of the second part, hereinafter called the Company:

W I T N E S S E T H :

That for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable considerations in hand paid, the receipt of which is hereby acknowledged, Owners lease to the Company for a period of two years from the date hereof, with the privilege of extension for further one year periods thereafter, upon payment of sums of money agreed upon, the exclusive right to prospect for, explore and examine, mine or remove, process and store all the minerals, mineral substances, metals, ores, ore-bearing materials and rock of every kind in, under or on all of the following described premises:

The South one-half (S½) of the North West Quarter (NW¼) and the North One-half (N½) of the South West Quarter (SW¼), all in Section 16, Township 11 South, Range 8 East of the Third Principal Meridian, in Hardin County, Illinois.

together with the right to enter thereon, to use available water and to remove samples, in accordance with the terms of a LEASE AND OPTION AGREEMENT of even date herewith entered into between the parties hereto. Also for and in the same consideration the Owners grant to the Company the option to purchase, at any time during the life of the aforesaid lease up to December 12, 1963, all the minerals, mineral substances, metals, ores, ore-bearing materials, and rock of every kind, in, under or on the above described premises together with the right to prospect for, mine or remove, process or store the same, water rights, the right of ingress and egress, and the right to purchase surface acreage, all in accordance with the terms of the said LEASE AND OPTION AGREEMENT of even date herewith. The terms of this agreement are fully set out in said LEASE AND OPTION AGREEMENT, which is here referred to and made a part hereof as if fully set out at length.

The term "parties of the first part" as herein used shall be construed to mean, "the parties of the first part, their heirs, assigns and successors in title howsoever such succession may be accomplished" and the term "party of the second part" shall be construed to mean "party of the second part, its assignees, designees and successors in title howsoever such succession may be accomplished."

IN WITNESS WHEREOF the parties of the first part have hereunto set their hands and seals the day and year first above written.

James W. Banks (Seal)

Mary Margaret Banks (Seal)

Approved as to form
JBC

ATTEST:

Walter P. Amyx
Its Secretary

THE NEW JERSEY ZINC COMPANY

By
Its Vice President

STATE OF ILLINOIS)
) SS:
COUNTY OF HARDIN)

I, Lowden F. Pruett, a Notary Public in and for said County, in the State aforesaid, do hereby certify that James W. Banks and Mary Margaret Banks, his wife

personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 12 day of December, 1953.

Lowden F. Pruett
Notary Public

Commission expires April 30, 1957

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

I, JOHN T. HOURIGAN, a Notary Public; do hereby certify that C. H. GEORGE to me personally known to be the Vice President of THE NEW JERSEY ZINC COMPANY, a New Jersey Corporation, and WALTER R. ANYAN, personally known to me to be the Secretary of said Corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement, appeared before me this day in person and severally acknowledged that they signed, sealed and delivered the said instrument as such Vice President and Secretary respectively, and caused the Corporate Seal to be affixed thereto, pursuant to authority given by the Board of Directors of said Corporation, as their free and voluntary act and as the free and voluntary act and deed of said Corporation, for the use and purposes therein set forth.

Given under my hand and notarial seal this 22nd day of December, 1953.

John T. Hourigan
Notary Public

JOHN T. HOURIGAN
Notary Public, State of New York
No. 30-6977000
Qualified in Nassau County
Certificates filed with New York
County Clerk and Register
Commission expires March 30, 1954

No.....

STATE OF ILLINOIS, }
Hardin County } ss.

This instrument was filed for record in the Recorder's Office of Hardin County aforesaid, on the 7th day of January A. D. 1954 at 2:30 o'clock P. M., and recorded in Book 5 of Misc on page 14

J. H. Henry Recorder

Recording Fee .....

22

THIS AGREEMENT made and entered into on this 8th day of February, 1954, by and between Lolene Bailey and Earl W. Bailey, her husband, of Clarkston, Michigan; Charles Hale and Freda Hale, his wife, of Hammond, Indiana; Velma Hale, a widow; Ruth Jerrels and Esden Jerrels, her husband, of Karbers Ridge, Illinois; Melba Moyers and Lloyd Moyers, her husband, of Golconda, Illinois; Guy Hale, Jr. and Billie Burke Hale, his wife, of East Alton, Illinois,

hereinafter called the Owners, parties of the first part, and THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, authorized to do business in the State of Illinois, party of the second part, hereinafter called the Company:

W I T N E S S E T H :

That for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable considerations in hand paid, the receipt of which is hereby acknowledged, Owners lease to the Company for a period of two years from the date hereof, with the privilege of extension for further one year periods thereafter, upon payment of sums of money agreed upon, the exclusive right to prospect for, explore and examine, mine or remove, process and store all the minerals, mineral substances, metals, ores, ore-bearing materials and rock of every kind in, under or on all of the following described premises:

The South West Fourth (SW¼) of the North East Quarter (NE¼), Section 16 (40 acres more or less);

The North West Fourth (NW¼) of the South East Quarter (SE¼), Section 16 (40 acres, more or less);

The North Half (N½) of the North East Fourth (NE¼) of the South East Quarter (SE¼), Section 16, (20 acres, more or less); and the West half (W½) of the North West fourth (NW¼) of the South West Quarter (SW¼), Section 15, (20 acres more or less);

All the above being in Township 11 South, Range 8 East of the Third Principal Meridian, in Hardin County, Illinois.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK, N.Y.

together with the right to enter thereon, to use available water and to remove samples, in accordance with the terms of a LEASE AND OPTION AGREEMENT of even date herewith entered into between the parties hereto. Also for and in the same consideration the Owners grant to the Company the option to purchase, at any time during the life of the aforesaid lease up to FEBRUARY 9, , 1959, all the minerals, mineral substances, metals, ores, ore-bearing materials, and rock of every kind, except oil and gas in, under or on the above described premises together with the right to prospect for, mine or remove, process or store the same, water rights, the right of ingress and egress, and the right to purchase surface acreage, all in accordance with the terms of the said LEASE AND OPTION AGREEMENT of even date herewith. The terms of this agreement are fully set out in said LEASE AND OPTION AGREEMENT, which is here referred to and made a part hereof as if fully set out at length.

The term "parties of the first part" as herein used shall be construed to mean, "the parties of the first part, their heirs, assigns and successors in title howsoever such succession may be accomplished" and the term "party of the second part" shall be construed to mean "party of the second part, its assignees, designees and successors in title howsoever such succession may be accomplished."

IN WITNESS WHEREOF the parties of the first part have hereunto set their hands and seals the day and year first above written.

Velma Hale (seal) — Guy Hale, Jr. (seal)

Billie Burke Hale (seal)

Lolene Bailey (Seal) — Charles Hale (Seal)

Earl W Bailey (Seal) — Freda Hale (Seal)

Ruth Jerrels (Seal) — Melba Mayes (Seal)

Eudon Jerrels (Seal) — Lloyd Mayes (Seal)

XBC

ATTEST:

Walter R. Ausman
its Secretary

THE NEW JERSEY ZINC COMPANY

By
its Vice President

STATE OF ~~[illegible]~~ INDIANA)
) SS:
COUNTY OF Lake)

I, Harry P. Ochstein, a Notary Public in and for said County, in the State aforesaid, do hereby certify that Lolene Bailey and Earl W. Bailey, her husband; Charles Hale and Freda Hale, his wife

personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 9th day of February, 1954.

Harry P. Ochstein
Notary Public

My Commission Expires March 2, 1954

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

~~I, _____, a Notary Public, do hereby certify that _____ to me personally known to be the Vice President of THE NEW JERSEY ZINC COMPANY, a New Jersey Corporation, and _____, personally known to me to be the _____ Secretary of said Corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement, appeared before me this day in person and severally acknowledged that they signed, sealed and delivered the said instrument as such Vice President and _____ Secretary respectively, and caused the Corporate Seal to be affixed thereto, pursuant to authority given by the Board of Directors of said Corporation, as their free and voluntary act and as the free and voluntary act and deed of said Corporation, for the use and purposes therein set forth.~~

~~Given under my hand and notarial seal this _____ day of _____, 195_.~~

~~Notary Public~~

STATE OF ILLINOIS)
) SS:
COUNTY OF HARDIN)

I, Lowden F. Pruett, a Notary Public in and for said County, in the State aforesaid, do hereby certify that Valma Hale, a widow

personally known to me to be the same person whose name are subscribed to the foregoing Lease and Option Agreement appeared before me this day in person, and acknowledged that she signed, sealed and delivered the said instrument as her free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and notarial seal this 10th day of February, 1954.

Lowden F. Pruett
Notary Public

STATE OF ILLINOIS)
) SS:
COUNTY OF HARDIN)

I, Lowden F. Pruett, a Notary Public in and for said County, in the State aforesaid, do hereby certify that Ruth Jerrels and Esdon Jerrels, her husband

personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 11th day of February, 1954.

Lowden F. Pruett
Notary Public

Commission expires April 30, 1957

STATE OF ILLINOIS)
) SS:
COUNTY OF POPE)

I, Lowden F. Pruett, a Notary Public in and for said County, in the State aforesaid, do hereby certify that Melba Moyers and Lloyd Moyers, her husband

personally known to me to be the same persons whose Names are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 11th day of February, 1954.

Lowden F. Pruett
Notary Public

Commission expires April 30, 1957

STATE OF ILLINOIS)
) SS:
COUNTY OF Hardin)

I, Lowden F. Pruett, a Notary Public in and for said County, in the State aforesaid, do hereby certify that Guy Hale, Jr. and Billie Burke Hale, his wife

personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 24 day of February, 1954.

Lowden F. Pruett
Notary Public

Commission expires April 30, 1957

~~STATE OF ILLINOIS~~)
) ~~SS:~~
~~COUNTY OF~~ _____)

I, _____, ~~a Notary Public~~ in and for said County, in the State aforesaid, do hereby certify that _____

_____

_____

personally known to me to be the same person_ whose name_ are subscribed to the foregoing Lease and Option Agreement appeared before me this day in person, and acknowledged that _he_ signed, sealed and delivered the said instrument as _____ free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and notarial seal this _____ day of _____, 195_.

_____
~~Notary Public~~

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

I, *John T. Hourigan* *C. V. Crane*, a Notary Public; do hereby certify that to me personally known to be the Vice President of THE NEW JERSEY ZINC COMPANY, a New Jersey Corporation, and *Walter R. Anyan*, personally known to me to be the Secretary of said Corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement, appeared before me this day in person and severally acknowledged that they signed, sealed and delivered the said instrument as such Vice President and Secretary respectively, and caused the Corporate Seal to be affixed thereto, pursuant to authority given by the Board of Directors of said Corporation, as their free and voluntary act and as the free and voluntary act and deed of said Corporation, for the use and purposes therein set forth.

Given under my hand and notarial seal this 8th day of MARCH, 1954.

John T. Hourigan
Notary Public

JOHN T. HOURIGAN
Notary Public, State of New York
No. 30-6 [illegible]
Qualified in Nassau County
Certificates filed with New York
County Clerk and Register
Commission expires March 30, 1954

STATE OF ILLINOIS, } ss. No. 3018
Hardin County

This instrument was filed for record in the Recorder's Office of Hardin County aforesaid, on the 3rd day of March A. D. 1957 at 3:00 o'clock P. M., and recorded in Book 5 of Misc on page 45

J. H. Henry Recorder

Recording Fee $4.00 pd by H.A.

STATE OF ILLINOIS, } ss. No. 3055
Hardin County

This instrument was filed for re-recording in the Recorder's Office of Hardin County aforesaid, on the 19th day of March A. D. 1954 at 2:00 o'clock P. M., and recorded in Book 5 of Miscellaneous on page 51

J. H. Henry Recorder

Recording Fee $4.00 pd by J. M.

1 2 4 A

THIS AGREEMENT made and entered into on this 11th day of March, 1954, by and between John Pyle and Elmeda J. Pyle, his wife, of RFD #2, Galatia, Saline County, Illinois J.P. E.J.P.

hereinafter called the Owners, parties of the first part, and THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, authorized to do business in the State of Illinois, party of the second part, hereinafter called the Company:

W I T N E S S E T H :

That for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable considerations in hand paid, the receipt of which is hereby acknowledged, Owners lease to the Company for a period of two years from the date hereof, with the privilege of extension for further one year periods thereafter, upon payment of sums of money agreed upon, the exclusive right to prospect for, explore and examine, mine or remove, process and store all the minerals, mineral substances, metals, ores, ore-bearing materials and rock of every kind in, under or on all of the following described premises:

The East One-Half (E½) of the North East Quarter (NE¼), in Section 16, Township 11 South Range 8 East of the Third Principal Meridian, in Hardin County, Illinois, (80 acres, more or less)

together with the right to enter thereon, to use available water and to remove samples, in accordance with the terms of a LEASE AND OPTION AGREEMENT of even date herewith entered into between the parties hereto. Also for and in the same consideration the Owners grant to the Company the option to purchase, at any time during the life of the aforesaid lease up to March 11, 1964, all the J.P. minerals, mineral substances, metals, ores, ore-bearing materials E.J.P. and rock of every kind, in, under or on the above described premises together with the right to prospect for, mine or remove, process or store the same, water rights, the right of ingress and egress, ~~and~~ ~~the right to purchase~~, all in accordance with the terms of the said LEASE AND OPTION AGREEMENT of even date herewith. The terms of this agreement are fully set out in said LEASE AND OPTION AGREEMENT, which is here referred to and made a part hereof as if fully set out at length.

The term "parties of the first part" as herein used shall be construed to mean, "the parties of the first part, their heirs, assigns and successors in title howsoever such succession may be accomplished" and the term "party of the second part" shall be construed to mean "party of the second part, its assignees, designees and successors in title howsoever such succession may be accomplished."

IN WITNESS WHEREOF the parties of the first part have hereunto set their hands and seals the day and year first above written.

John Pyle (Seal)

Elmeda J. Pyle (Seal)

Approved as to form
KRC

ATTEST:

Walter R. Amyan
its Secretary

THE NEW JERSEY ZINC COMPANY

By
its Vice President

STATE OF ILLINOIS)
) SS:
COUNTY OF SALINE)

I, Lowden F. Avett, a Notary Public in and for said County, in the State aforesaid, do hereby certify that John Pyle and Elmetta J. Pyle, his wife,

personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 11th day of March, 1954.

Lowden F. Avett
Notary Public

Commission expires April 30, 1957

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

I, JOHN T. HOURIGAN, a Notary Public; do hereby certify that C. H. GEORGE to me personally known to be the Vice President of THE NEW JERSEY ZINC COMPANY, a New Jersey Corporation, and WALTER R. ANKAN, personally known to me to be the Secretary of said Corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement, appeared before me this day in person and severally acknowledged that they signed, sealed and delivered the said instrument as such Vice President and Secretary respectively, and caused the Corporate Seal to be affixed thereto, pursuant to authority given by the Board of Directors of said Corporation, as their free and voluntary act and as the free and voluntary act and deed of said Corporation, for the use and purposes therein set forth.

Given under my hand and notarial seal this 16th day of March, 1954.

John T. Hourigan
Notary Public
JOHN T. HOURIGAN
Notary Public, State of New York
No. 30-6977000
Qualified in Nassau County
Certificates filed with New York
County Clerk and Register
Commission expires March 30, 1954

STATE OF ILLINOIS, }
Hardin County } ss.

No. 4004

This instrument was filed for record in the Recorder's Office of Hardin County aforesaid, on the 6th day of April A. D. 1954 at 2:30 o'clock P. M., and recorded in Book 5 of Miscellaneous on page 69

J. H. Henry
Recorder

Recording Fee

13A

JUN

THIS AGREEMENT made and entered into on this 11th day of January, 1954, by and between Walter V. Moore, as Trustee Under the Last Will and Testament of Walter J. Moore, Deceased; Walter V. Moore, individually, and Evelyn A. Moore, his wife, of Homestead, Florida; and Helen E. John and Clifford W. John, her husband, of Sterling, Illinois hereinafter called the Owners, parties of the first part, and THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, authorized to do business in the State of Illinois, party of the second part, hereinafter called the Company:

W I T N E S S E T H :

That for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable considerations in hand paid, the receipt of which is hereby acknowledged, Owners lease to the Company for a period of two years from the date hereof, with the privilege of extension for further one year periods thereafter, but not exceeding five(5) years upon payment of sums of money agreed upon, the exclusive right to prospect for, explore and examine, mine or remove, process and store all the minerals, mineral substances, metals, ores, ore-bearing materials and rock of every kind in, under or on all of the following described premises:

The North West Quarter (NW¼), 160 acres, more or less; The East One-half (E½) of the North East Quarter (NE¼), 80 acres, more or less; The East One-half of the South East Quarter (SE¼), 80 acres, more or less; and the North One-half (N½) of the North East Fourth (NE¼) of the South West Quarter (SW¼), 20 acres, more or less; all the above described land being in Section 15, Township 11 South, Range 8 East of the Third Principal Meridian, in Hardin County, Illinois, and containing in the aggregate 340 acres, more or less.

together with the right to enter thereon, to use available water and to remove samples, in accordance with the terms of a LEASE AND OPTION AGREEMENT of even date herewith entered into between the parties hereto. Also for and in the same consideration the Owners grant to the Company the option to purchase, at any time during the life of the aforesaid lease up to January 11th, 1959, all the minerals, mineral substances, metals, ores, ore-bearing materials, and rock of every kind, in, under or on the above described premises together with the right to prospect for, mine or remove, process or store the same, water rights, the right of ingress and egress, subject to the rights of the owner of the surface ~~and the right to purchase surface acreage~~, all in accordance with the terms of the said LEASE AND OPTION AGREEMENT of even date herewith. The terms of this agreement are fully set out in said LEASE AND OPTION AGREEMENT, which is here referred to and made a part hereof as if fully set out at length.

The term "parties of the first part" as herein used shall be construed to mean, "the parties of the first part, their heirs, assigns and successors in title howsoever such succession may be accomplished" and the term "party of the second part" shall be construed to mean "party of the second part, its assignees, designees and successors in title howsoever such succession may be accomplished."

IN WITNESS WHEREOF the parties ~~of the first part~~ hereto have hereunto set their hands and seals the day and year first above written.

Helen E. John (SEAL)
Helen E. John

Clifford W. John (SEAL)
Husband of Helen E. John

Walter V. Moore (Seal)
As Trustee Under the Last Will and Testament of Walter J. Moore, Deceased

Walter V. Moore (Seal)
Individually

Evelyn A. Moore (SEAL)
Wife of Walter V. Moore

Approved as to form
XBC

ATTEST:
Walter R. Runyan
its Secretary

THE NEW JERSEY ZINC COMPANY
By
its Vice President

STATE OF ~~[illegible]~~ FLORIDA
COUNTY OF DADE } SS:

I, Mamie P. Smith, a Notary Public in and for said County, in the State aforesaid, do hereby certify that Walter V. Moore, as Trustee Under the Last Will and Testament of Walter J. Moore, Deceased; Walter V. Moore, individually, and Carolyn A. Moore, his wife, personally known to me to be the same persons whose names are subscribed to the foregoing contract and Agreement 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.

Given under my hand and notarial seal this 11th day of January, 1954.

Mamie P. Smith
Notary Public

Notary Public State of Florida at Large
My commission expires July 27, 1955
Bonded by American Surety Co. of N. Y.

STATE OF ILLINOIS)
) SS:
COUNTY OF Whiteside)

I, Gladys Ward, a Notary Public in and for said County, in the State aforesaid, do hereby certify that Helen E. Hohn and ~~Clifford W.~~ John, her husband

personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 19th day of January, 1954.

Gladys Ward
Notary Public

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

I, John T. Hourigan, a Notary Public; do hereby certify that C. H. Gerrod to me personally known to be the Vice President of THE NEW JERSEY ZINC COMPANY, a New Jersey Corporation, and Walter R. Angan, personally known to me to be the Secretary of said Corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement, appeared before me this day in person and severally acknowledged that they signed, sealed and delivered the said instrument as such Vice President and Secretary respectively, and caused the Corporate Seal to be affixed thereto, pursuant to authority given by the Board of Directors of said Corporation, as their free and voluntary act and as the free and voluntary act and deed of said Corporation, for the use and purposes therein set forth.

Given under my hand and notarial seal this 26th day of January, 1954.

John T. Hourigan
Notary Public

JOHN T. HOURIGAN
Notary Public, State of New York
No. 30-6977000
Qualified in Nassau County
Certificates filed with New York
County Clerk and Register
Commission expires March 30, 1954

STATE OF ILLINOIS, }
Hardin County } ss.

No. 2039

This instrument was filed for record in the Recorder's Office of Hardin County aforesaid, on the 28th day of January A. D. 1954 at 3:30 o'clock P. M., and recorded in Book 5 of Misc. on page 32

L. H. Henry Recorder

Recording Fee 3.75

28 A

RECORDED
JUN 2 - 1954

THIS AGREEMENT made and entered into on this 20th day of March, 1954, by and between William M. Hale, a widower, of Shawneetown, Gallatin County, Illinois; Osie Hale and Blanche Hale, his wife, of Evansville, Vanderburgh County, Indiana,

hereinafter called the Owners, parties of the first part, and THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, authorized to do business in the State of Illinois, party of the second part, hereinafter called the Company:

W I T N E S S E T H :

That for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable considerations in hand paid, the receipt of which is hereby acknowledged, Owners lease to the Company for a period of two years from the date hereof, with the privilege of extension for further one year periods thereafter, upon payment of sums of money agreed upon, the exclusive right to prospect for, explore and examine, mine or remove, process and store all the minerals, mineral substances, metals, ores, ore-bearing materials and rock of every kind in, under or on all of the following described premises:

South one-half (S½), North East Quarter (NE¼) Southwest Quarter(SW¼), (20 acres, more or less), and the East one-half (E½), Northwest Quarter, (NW¼), South West Quarter, (20 acres, more or less) in Section 15: Also North one-half (N½) North West Quarter (NW¼), North West Quarter (NW¼), (20 acres, more or less) in Section 22:

All the above land being in Township 11 S. Range 8 E, Third Principal Meridian, in Hardin County, Illinois.

together with the right to enter thereon, to use available water and to remove samples, in accordance with the terms of a LEASE AND OPTION AGREEMENT of even date herewith entered into between the parties hereto. Also for and in the same consideration the Owners grant to the Company the option to purchase, at any time during the life of the aforesaid lease up to March 20th, 1964, all the minerals, mineral substances, metals, ores, ore-bearing materials, and rock of every kind, in, under or on the above described premises together with the right to prospect for, mine or remove, process or store the same, water rights, the right of ingress and egress, and the right to purchase surface acreage, all in accordance with the terms of the said LEASE AND OPTION AGREEMENT of even date herewith. The terms of this agreement are fully set out in said LEASE AND OPTION AGREEMENT, which is here referred to and made a part hereof as if fully set out at length.

The term "parties of the first part" as herein used shall be construed to mean, "the parties of the first part, their heirs, assigns and successors in title howsoever such succession may be accomplished" and the term "party of the second part" shall be construed to mean "party of the second part, its assignees, designees and successors in title howsoever such succession may be accomplished."

IN WITNESS WHEREOF the parties of the first part have hereunto set their hands and seals the day and year first above written.

William Mitchell (Seal)

Ione Hale (Seal)

Blanche Hale (Seal)

Approved as to form
TSBC

ATTEST:

Walter R. Guyan
Its Secretary

THE NEW JERSEY ZINC COMPANY

By
Its Vice President

STATE OF ILLINOIS)
) SS:
COUNTY OF SALINE)

I, Lowden F. Pruett, a Notary Public in and for said County, in the State aforesaid, do hereby certify that William M. Hale, a widower; Usie Hale and Blanche Hale, his wife

personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 20th day of March, 1954.

Lowden F. Pruett
Notary Public

Commission expires April 30, 1957

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

I, John T. Hourigan, a Notary Public; do hereby certify that C. H. Georgs to me personally known to be the Vice President of THE NEW JERSEY ZINC COMPANY, a New Jersey Corporation, and Walter R. Anyan, personally known to me to be the Secretary of said Corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement, appeared before me this day in person and severally acknowledged that they signed, sealed and delivered the said instrument as such Vice President and Secretary respectively, and caused the Corporate Seal to be affixed thereto, pursuant to authority given by the Board of Directors of said Corporation, as their free and voluntary act and as the free and voluntary act and deed of said Corporation, for the use and purposes therein set forth.

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

John T. Hourigan
Notary Public

JOHN T. HOURIGAN
Notary Public, State of New York
No. 30-6977000
Qualified in Nassau County
Certificates filed with New York
County Clerk and Register
Commission expires March 30, 1954

STATE OF ILLINOIS, } ss. No. 4253
Hardin County

This instrument was filed for record in the Recorder's Office of Hardin County, aforesaid, on the 6th day of July A. D. 1954 at 3:00 o'clock P. M., and recorded in Book 5 of Misc on page 107

J. H. Henry Recorder

Recording Fee $3.75 pd

51A

THIS AGREEMENT made and entered into on this 30thday of ,October , 1954, by and between William M. Hale, A widower, w,m 71 of Shawneetown, Gallatin County, Illinois

hereinafter called the Owners, parties of the first part, and THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, authorized to do business in the State of Illinois, party of the second part, hereinafter called the Company:

W I T N E S S E T H :

That for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable considerations in hand paid, the receipt of which is hereby acknowledged, Owners lease to the Company for a period of two years from the date hereof, with the privilege of extension for further one year periods thereafter, upon payment of sums of money agreed upon, the exclusive right to prospect for, explore and examine, mine or remove, process and store all the minerals, mineral substances, metals ores, ore-bearing materials and rock of every kind in, under or on all of the following described premises:

An undivided one-half interest in and to the following: South One-half (S½) of the South West Quarter (SW¼) of Section 15, Township 11 South, Range 8 East of the Third Principal Meridian, in Hardin County, Illinois.

together with the right to enter thereon, to use available water and to remove samples, in accordance with the terms of a LEASE AND OPTION AGREEMENT of even date herewith entered into between the parties hereto. Also for and in the same consideration the Owners grant to the Company the option to purchase, at any time during the life of the aforesaid lease up to October 30, 1964, all the M m H minerals, mineral substances, metals, ores, ore-bearing materials, and rock of every kind, in, under or on the above described premises together with the right to prospect for, mine or remove, process or store the same, water rights, the right of ingress and egress, and the right to purchase surface acreage, all in accordance with the terms of the said LEASE AND OPTION AGREEMENT of even date herewith. The terms of this agreement are fully set out in said LEASE AND OPTION AGREEMENT, which is here referred to and made a part hereof as if fully set out at length.

The term "parties of the first part" as herein used shall be construed to mean, "the parties of the first part, their heirs, assigns and successors in title howsoever such succession may be accomplished" and the term "party of the second part" shall be construed to mean "party of the second part, its assignees, designees and successors in title howsoever such succession may be accomplished."

IN WITNESS WHEREOF the parties of the first part have hereunto set their hands and seals the day and year first above written.

William M. Hale (Seal)

_____ (Seal)

ATTEST:

Walter R. Ayers
its Secretary

THE NEW JERSEY ZINC COMPANY

By _____
EXECUTIVE Vice President

STATE OF ILLINOIS)
) SS:
COUNTY OF Saline)

I, Lorden F. Truett, a Notary Public in and for said County, in the State aforesaid, do hereby certify that William M. Hale, a widower

personally known to me to be the same person whose name is subscribed to the foregoing Lease and Option Agreement appeared before me this day in person, and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and notarial seal this 30th day of October, 1954.

Lorden F. Truett
Notary Public

Commission expires April 30, 1957

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

I, Richard J. Mackessy, a Notary Public; do hereby certify that C. H. George to me personally known to be the EXECUTIVE Vice President of THE NEW JERSEY ZINC COMPANY, a New Jersey Corporation, and Walter R. Anyan, personally known to me to be the Secretary of said Corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement, appeared before me this day in person and severally acknowledged that they signed, sealed and delivered the said instrument as such EXECUTIVE Vice President and Secretary respectively, and caused the Corporate Seal to be affixed thereto, pursuant to authority given by the Board of Directors of said Corporation, as their free and voluntary act and as the free and voluntary act and deed of said Corporation, for the use and purposes therein set forth.

Given under my hand and notarial seal this 16th day of November, 1954.

Richard J. Mackessy
Notary Public

RICHARD J. MACKESSY
NOTARY PUBLIC State of New York
No. 5 [illegible] 4100
Qualified in Westchester County
Certificate filed in New York County
Commission expires March 30, 1956

STATE OF ILLINOIS } ss. No. 6489
Hardin County

This instrument was filed for record in the Recorder's Office of Hardin County, aforesaid, on the 18th day of October A. D. 1955 at 11:45 o'clock A.M. and recorded in Book 5 of Misc. on page 404

J. H. Henry Recorder

Recording Fee $3.75

1-ACD-56A

THIS AGREEMENT made and entered into on this 9th day of March, 1956, by and between Alvin A. Hale and Mable Hale, his wife, of Rosiclare, Hardin County, Illinois,

hereinafter called the Owners, parties of the first part, and THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, authorized to do business in the State of Illinois, party of the second part, hereinafter called the Company:

W I T N E S S E T H :

That for and in consideration of the sum of ONE ($1.00) DOLLAR and other good and valuable considerations in hand paid, the receipt of which is hereby acknowledged, Owners lease to the Company for a period of ~~two~~ one years from the date hereof, with the privilege of extension for further one year periods thereafter, upon payment of sums of money agreed upon, the exclusive right to prospect for, explore and examine, mine or remove, process and store all the minerals, mineral substances, metals ores, ore-bearing materials and rock of every kind except oil and gas in, under or on all of the following described premises:

The South West Fourth (SW¼) of the North East Quarter (NE¼), Section 16 (40 acres more or less);

The North West Fourth (NW¼) of the South East Quarter (SE¼), Section 16 (40 acres more or less);

The North Half (N½) of the North East Fourth (NE¼) of the South East Quarter (SE¼), Section 16 (20 acres more or less), and the West Half (W½) of the North West Quarter (NW¼) of the South West Quarter (SW¼), Section 15 (20 acres more or less);

All the above land being in Township 12 South, Range 8 East of the Third Principal Meridian, in Hardin County, Illinois.

together with the right to enter thereon, to use available water and to remove samples, in accordance with the terms of a LEASE AND OPTION AGREEMENT of even date herewith entered into between the parties hereto. Also for and in the same consideration the Owners grant to the Company the option to purchase, at any time during the life of the aforesaid lease up to March 9, 1961, all the minerals, mineral substances, metals, ores, ore-bearing materials, and rock of every kind, except oil and as X in, under or on the above described premises together with the right to prospect for, mine or remove, process or store the same, water rights, the right of ingress and egress, ~~and the right to purchase surface acreage~~, all in accordance with the terms of the said LEASE AND OPTION AGREEMENT of even date herewith. The terms of this agreement are fully set out in said LEASE AND OPTION AGREEMENT, which is here referred to and made a part hereof as if fully set out at length.

The term "parties of the first part" as herein used shall be construed to mean, "the parties of the first part, their heirs, assigns and successors in title howsoever such succession may be accomplished" and the term "party of the second part" shall be construed to mean "party of the second part, its assignees, designees and successors in title howsoever such succession may be accomplished."

IN WITNESS WHEREOF the parties of the first part have hereunto set their hands and seals the day and year first above written.

Alvin E. Hale (Seal)

Mable M. Hale (Seal)

ATTEST:

Walter D. [illegible]

THE NEW JERSEY ZINC COMPANY

BY [illegible]

Its Vice President

STATE OF ILLINOIS)
) SS:
COUNTY OF HARDIN)

I, LOUDEN F. PRUETT, a Notary Public in and for said County, in the State aforesaid, do hereby certify that Alvin L. Hale and Mable L. Hale, his wife, personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement 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.

Given under my hand and notarial seal this 9th day of March, 1956.

Louden F. Pruett
Notary Public

Commission expires April 30, 1957

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

I, John T. Hourigan, a Notary Public; do hereby certify that S. S. Goodwin to me personally known to be the Vice President of THE NEW JERSEY ZINC COMPANY, a New Jersey Corporation, and Walter R. Anyan, personally known to me to be the Secretary of said Corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing Lease and Option Agreement, appeared before me this day in person and severally acknowledged that they signed, sealed and delivered the said instrument as such Vice President and Secretary respectively, and caused the Corporate Seal to be affixed thereto, pursuant to authority given by the Board of Directors of said Corporation, as their free and voluntary act and as the free and voluntary act and deed of said Corporation, for the use and purposes therein set forth.

Given under my hand and notarial seal this 16th day of March, 1956.

John T. Hourigan
Notary Public
JOHN T. HOURIGAN
NOTARY PUBLIC, State of New York
No. 30-6977000
Qualified in Nassau County
Cert. filed with New York County clerk
Commission Expires March 30, 1956

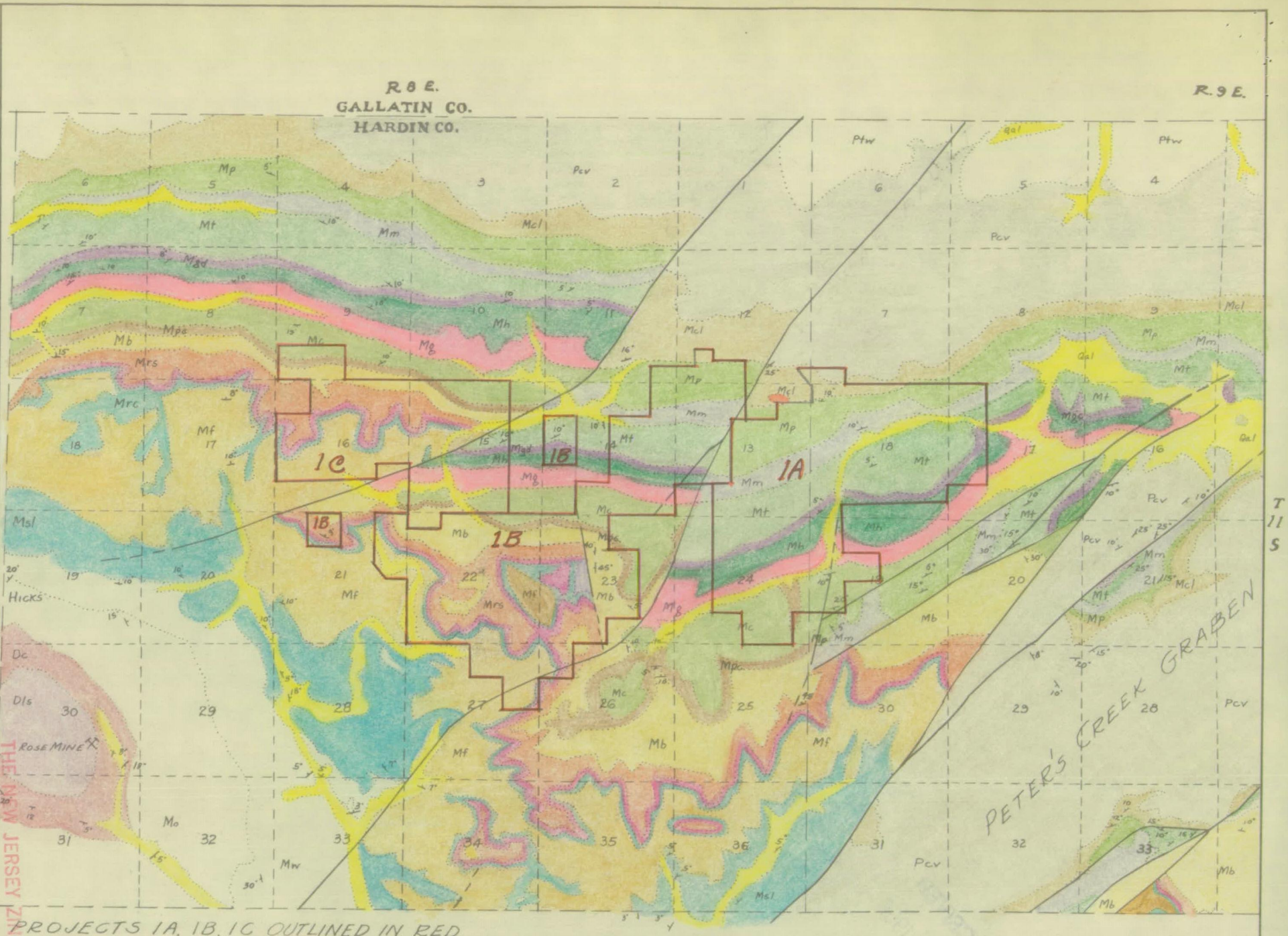
STATE OF ILLINOIS, }
Hardin County } ss.

No. 6800

This instrumen[illegible] record in the Recorder's Office of [illegible] said, on the 19th March A. D. 1956 at 3:45 [illegible] P. M., and recorded in 5 Misc. [illegible] page 447

Juanita R. Isbell
Recorder

Recording Fee $3.75



From Hardin Co. Geologic Map
by Illinois and U.S. Geological Surveys
and from G. M. Fowler

POSTED TO DATE

DRAWN H.C. DATE 3/26/56
TRACED J.L. SCALE 1" = 5280'

THE NEW JERSEY ZINC COMPANY

GEOLOGIC MAP
PROJECTS 1-A, 1-B, 1-C, HARDIN COUNTY, ILL.

FILE NO.
AX - ILL - 18

Southern Illinois

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N.Y.

X 5407 C 1M 3-53

RECEIVED
JUN 26 1968

STRATIGRAPHIC SECTION

SOUTHERN ILLINOIS FLUORSPAR DISTRICT

Data from Illinois State Geological Survey Bulletin 76

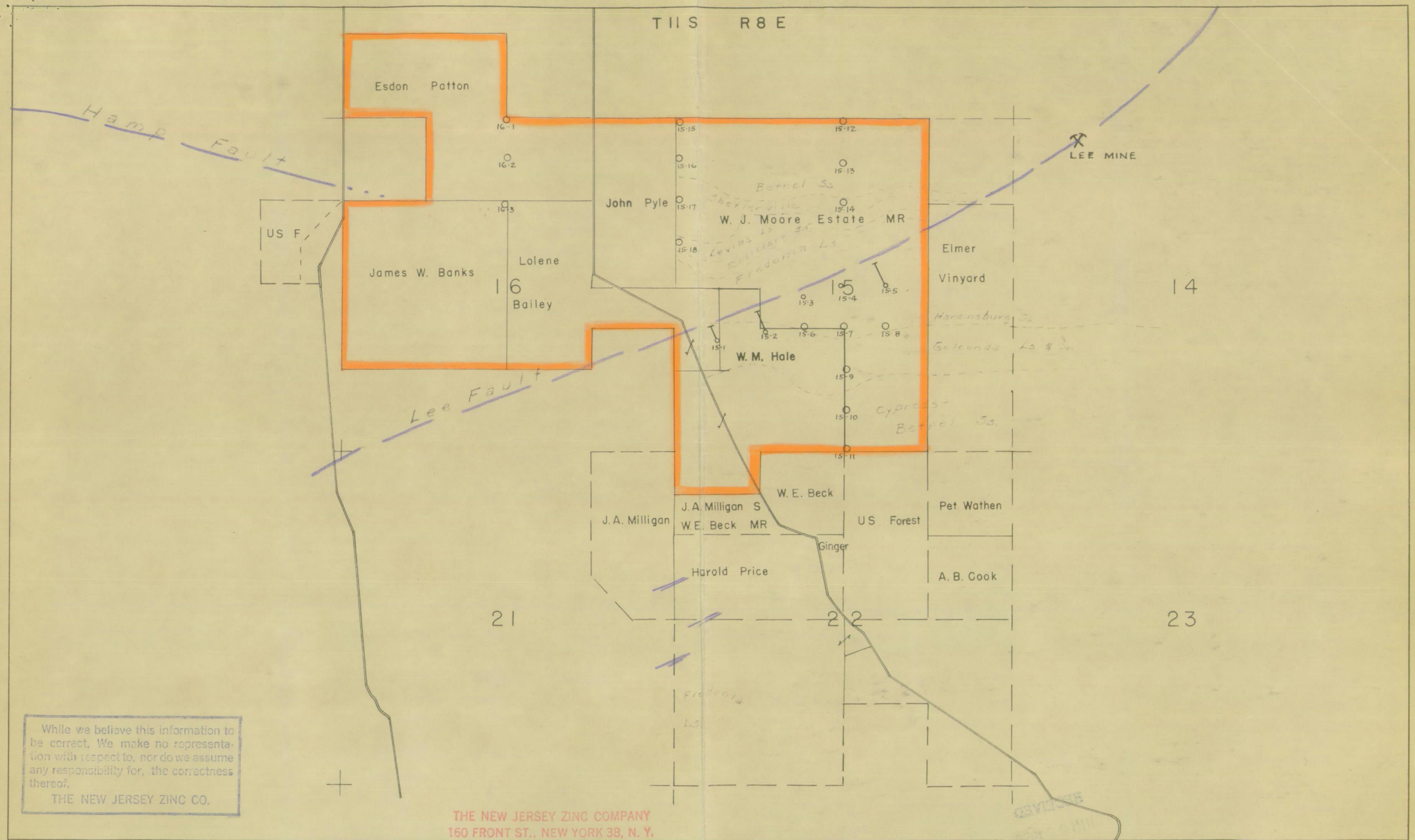
				Average thickness in feet.
PENNSYLVANIAN		Caseyville Sandstone	Pcv	460
MISSISSIPPIAN	CHESTER	Kinkaid Formation Degonia Sandstone Chlore Formation	McI	260
		Palestine Sandstone	Mp	60
		Menard Limestone and Shale	Mm	120
		Waltersburg Sandstone (Mw)	Mt	40
		Vienna Limestone and Shale (Mv)		20
		Tar Springs Sandstone	Mgd	90
		Glen Dean Limestone and Shale		60
		Hardinsburg Sandstone	Mh	90
		Golconda Limestone and Shale	Mg	145
		Cypress Sandstone	Mc	110
		Paint Creek Formation (Mpc)		25
		Bethel Sandstone	Mb	25
		Downey's Bluff Limestone (Mdb)	Mrs	30
		Shetlerville Limestone and Shale (Ms)		60
	IOWA	Levias Limestone (Mlo)	Mf	20
		Rosiclare Sandstone (Mrc)		20
		Fredonia Limestone		205
		St Louis Limestone	Msl	500
		Warsaw Limestone	Mw	250
		Osage Formation	Mo	550
		Kinderhook Group (shale)		410
DEVONIAN		Lower New Albany Shale	Dc	
		Devonian Limestone and Chert	Dls	350

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK 38, N. Y.

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY HARRISBURG, ILL.	DISTRICT SO. ILLINOIS
DRAWN JMC DATE 12-23-54 TRACED JEL SCALE 1"=500'	STRATIGRAPHIC SECTION	FILE NO. AX-ILL.-12

X 5407 C 1M 3-53

RECEIVED
JUN 2 6 1956



POSTED TO DATE 4/2/56 JMH	THE NEW JERSEY ZINC COMPANY PLATTEVILLE, WISC.	DRAWN LEA DATE 3-20-56 TRACED JEL SCALE 1" = 1320'	PROJECT I-C PROPERTY MAP	DISTRICT Hardin County, Illinois FILE NO. AX-ILL-17

X 5407 B 1M 3-53

RECEIVED
JUN 26 1956