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

November 16, 1953

MEMORANDUM

To: R. E. Adams, Chief, Oper. Control and Statistics Div., DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Removal of application from the active files
Docket No. DMEA 1829 - Manganese
Utah Construction Company & Associates
Section 23, T. 48 N., R. 27 W.
Aitkin County, Minnesota

The subject application, dated August 3, 1951, was approved by the Supply Division, DMA, on September 5, 1951, and received by the PED, DMA, on the same day. The recommendation of the PED was for the application to be put in the inactive file.

On January 30, 1952, Mr. Beardsley of the Utah Construction Company indicated his company intended to submit an amended application. These data were not received and by letter of July 3, 1952, the matter was called to the attention of the applicant.

On July 21, 1952, the applicant advised DMEA that the proposal was contingent upon acceptance by the Defense Materials Procurement Administration of a related proposal, and therefore requested DMEA to hold open the subject application until DMPA acted with respect to the other application.

On March 30, 1953, we again asked what the Applicant intended to do and were advised by letter of April 23, 1953, that the intention was to file an amended application. We were then requested to keep the subject file open.

When no further data were received, on June 8, 1953, we wrote two separate letters to ask the Applicant for the information previously promised. On August 26, 1953, when no answer had been received to either letter we notified the Applicant that if we had not heard from him by October 1, 1953, the docket would be transferred to the inactive files and the matter closed.

Withdrawn on receipt of this memo

On September 22, 1953, the Applicant while not furnishing the data promised still requested DMEA to hold the application open.

In view of the long period of time the subject application has been held in abeyance and the reluctance of the Applicant to submit the amended application promised in January 30, 1952, we notified the Applicant on September 28, 1953, that if the necessary data were not received by November 15, 1953, the subject application would be closed.

The docket is transmitted herewith.

WSMartin
W. S. Martin, Chief
Iron and Ferro-Alloys Division

400

FILE COPY
SURNAME:

Rutledge
Martin

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

November 16, 1953

MEMORANDUM

To: R. E. Adams, Chief, Oper. Control and Statistics Div., DMEA

From: Iron and Ferro-Alloys Division, DMEA

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The docket is transmitted herewith.

SIGNED

W. S. Martin, Chief
Iron and Ferro-Alloys Division

FARutledge:foc
11-16-53
cc: Docket
Code 400
Admr. Reading File

400

FILE COPY
SURNAME:

Rutledge
Mountain

9/25/53

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

SEP 28 1953

Mr. Carl H. McClure III
Putney, Twombly, Hall & Skidmore
165 Broadway
New York 6, New York

Re: Docket No. DMA 1829X - Manganese
Utah Construction Company
& Associates
Aitkin County, Minnesota

Dear Mr. McClure:

This acknowledges receipt of your letter of September 22, 1953, with reference to our two letters of June 3 and August 26, 1953, to Mr. William M. Hayden concerning the subject application. Our letter of August 26 advised Mr. Hayden that unless we had received a reply by October 1, 1953, to our several earlier requests of Utah Construction Company for certain specific information needed to process the application, we would withdraw the docket from our active files and consider the matter closed.

The Defense Minerals Exploration Administration has now held this application in abeyance for approximately two years in compliance with various requests by the applicant's representatives, with the understanding that the applicant would furnish an amended application containing the requisite data.

We wish to cooperate fully in the matter of allowing ample time but we are anxious to close the very few remaining old DMA dockets and if the needed data are not received by November 15, 1953, the subject docket will be withdrawn from our active files.

Should Utah Construction Company be unable to obtain and supply us with the required subordination agreement and other necessary data by November 15, a new application may, of course, be submitted to DMEA at such future time as these data are available.

Sincerely yours,

Frank E. Johnson
ACTING Administrator

R.C.S.
9-28-53

Copy to: Mr. William M. Hayden
President, Chemetals Corp.
488 Madison Avenue
New York 22, New York

Copy to: Docket
Field Team, Reg. 5
Code 400
Adm. Read. File
Martha Carr, USGS
Gilbert DeHuff, USBM

PUTNEY, TWOMBLY, HALL & SKIDMORE
COUNSELORS AT LAW
165 BROADWAY, NEW YORK 6, N. Y.

HENRY B. TWOMBLY
LEMUEL SKIDMORE
EDWARD B. TWOMBLY
CHARLES B. HESTER
WILLIAM B. PUTNEY, 3RD
LOUIS H. HALL, JR.
THOMAS M. KERRIGAN
CARL H. McCLURE III

HOWARD F. ORDMAN
STEPHEN J. LUCEY
EDWARD F. CALLAN
WAYNE JOHNSON, JR.
MALCOLM A. CRUSIUS
LEMUEL SKIDMORE, JR.

FREDERIC R. SANBORN
COUNSEL

TEL. WORTH 4-2600
CABLE ADDRESS: YENTUP

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
SEP 23 1953

September 22, 1953.

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

Re: Docket No. DMA 1829X - Manganese
Utah Construction Company and Associates
Aitkin County, Minnesota

Dear Mr. Mittendorf:

This will refer to your two letters of June 8, 1953, and your letter of August 26, 1953, addressed to Mr. William M. Hayden in connection with the above application.

Due to further negotiations and development of the above exploration project which are still going on, it has been impossible to provide you with new revised cost estimates and the material referred to in the five items of your letter of June 8, 1953. Pending further developments we would appreciate it if you would continue to hold the above reference application in your active files since the applicants desire to pursue the matter further.

As soon as the applicants are in a position to furnish you with the information requested, we will be in touch with you promptly.

Sincerely yours,

Carl H. McClure III

CHM:IR

FILE COPY
SURNAME:

400 R. C. Rutledge

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

AUG 2 6 1953

Mr. William M. Hayden, President
Chemetals Corporation
488 Madison Avenue
New York 22, New York

Re: Docket No. DMA 1829X - Manganese
Utah Construction Company and
Associates
Aitkin County, Minnesota

Dear Mr. Hayden:

Reference is made to our two letters of June 8, 1953, concerning the subject docket. To date we have not heard from you concerning the five items mentioned in the one letter or the revised costs requested in the other.

If you wish to continue with the referenced application or an amended application will you please advise us.

If we have not heard from you by October 1, 1953, we will withdraw the docket from our active files and consider the matter closed.

Sincerely yours,

C. O. Mittendorf

Administrator

cc: Utah Construction Company
and Associates
Aitkin County, Minnesota

cc: Docket
Code 400
FT. Reg. 8
Operating Comm.
Adm. Reading File
Mr. DeHuff, USBM
Mrs. Martha Carr, USGS

R. C. R. 8-26-53

MANGANESE METALLURGICAL TESTS IN PROGRESS BY DMPA

E. S. Nossen Laboratories, Inc., Patterson, N. J.

Ore from Areostock County, Maine
"Nossen Nitric Acid Cycle" process

Manganese Chemicals Corp., Minneapolis, Minn. (R. S. Dean)

Minnesota Iron-manganese ore
Ammonium Carbamite process

Mangalay, Inc., Fort Worth, Texas

Recovery of ferromanganese from open hearth steel furnace slags

Southwest Engineering Company, Los Angeles, Calif.

Wad ores of Virginia, Arkansas, New Mexico and Arizona,
Areostock County ore too.

- - - - - - - -

FILE COPY
SURNAME:

140

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

Rewritten by

Rutledge
Martin
A. E. Kane
ackane
Parker
Martin
Kane
Hedges
Rutledge
Kjenson

JUN 8 1953

Mr. William M. Hayden, President
Chemetals Corporation
488 Madison Avenue
New York 22, New York

Re: Docket No. DMA-1829X - Manganese
Utah Construction Company and Associates
Aitkin County, Minnesota

Dear Mr. Hayden:

Reference is made to your conversation with our Iron and Ferro-Alloys Division on May 15, 1953, when you asked us to reactivate the subject application, which has been held in abeyance since January 30, 1952, at the request of the Utah Construction Company.

The above exploration project is now being reviewed to determine to what extent modification will be required to suit current conditions. We have already noted, however, ~~five~~ items which can be called to your attention at once, as follows:

1. There is no record of the assignment of the lease of January 1, 1950, from Tintic Standard Mining Company, Nellie B. Mining Company, Hubert E. Howard, Harold E. Raddatz, and William M. Hayden to the Utah Construction Company. Six copies of such assignment will be required.

2. In lieu of the Landlord's Subordination Agreement which we formerly used we shall need from the Andyck Corporation six copies of Owner's Consent to Lien, for which we enclose forms. This should refer to the lease dated January 1, 1950 to Kay Todd, Sinclair H. Todd, Edward P. Scallon, and Frances Scallon and the successive assignments.

3. The present "Landlord's Subordination Agreement" signed by Kay Todd and Edward P. Scallon is deficient in that it describes the signers thereof as owners of the property when they are actually only the lessees, and it should be signed not only by them, but also by their wives. Accordingly, we are attaching a new subordination agreement for their signatures.

4. This office should be informed of the exact name of the Operator, which should be inserted in the attached Subordination Agreement, if it is there stated incorrectly. The application states that the applicant is the assignee of the lease, and the "Dummy" assignment refers to "The Utah Construction Company and Associates, Inc." but the Landlord's Subordination Agreement dated August 6, 1951, refers only to "Utah Construction Company and Associates". If the Operator is not a corporation, we should be advised of its legal status--that is whether it is a partnership or not, and the names of all concerned. If the assignment to the Operator also creates a lien on production superior to the Government's, another subordination agreement from the Tintic Standard Mining Company et al., would be necessary.

5. The original lease and assignment thereof and option agreement indicate that the property is located in section 23, T. 48, R. 27 Aitkin County, Minn. They should be corrected to indicate that the property is located in section 23, T. 48 N., R. 27 W. Aitkin County, Minn. (as appears under the title of the map "Proposed Manganese Mine").

Sincerely yours,

C. O. Mittendorf (fw)

Administrator

MDA
6-8-53

Copy to: Utah Construction Company
and Associates
1 Montgomery Street
San Francisco 4, California

Rutledge/Martin/Kane/ema
5/25/53

cc: Mails & Files
Mr. Martin
FT. Reg. V - 2
Adm. R. File
C. O. Mittendorf
N. B. Melcher, USBM
M. D. Crittenden, USGS
J. L. Hofflun
A. E. Kane
Chron.
Pending

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

SUBORDINATION AGREEMENT

WHEREAS, the undersigned are the Assignors mentioned in the contract of assignment of lease dated _____, 1950, in which they assigned their right, title and interest in and to the lease from Andyck Corporation dated January 1, 1950, to Tintic Standard Mining Company et al., as assignees, and the latter agreed to pay the royalties specified therein on all iron, manganese and magniferous ores or concentrates mined and removed from the property which is also the subject of a proposed Exploration Project Contract between the United States of America, hereinafter called the "Government" and The Utah Construction Company and Associates, Inc.

NOW, THEREFORE, the undersigned, as such Assignors, do by these presents subordinate all of their right, title and interest under the provisions of the said lease and the said contract of assignment of lease to the right, title and interest of the Government under the provisions of the said Exploration Project Contract, and agree that the lien and claim of the Government shall be prior to the undersigned's rights under the terms of the said lease and contract of assignment thereof; and to commit no act nor assert any right, title, or interest that might contravene or conflict with the prior lien and claim of the Government under the provisions of said Exploration Project Contract; and

The undersigned further agree that if the said leasehold interest should be surrendered to them by the assignees above-mentioned, or any subsequent assignees thereof, or be terminated at any time prior to the expiration of the rights of the Government under the said Exploration Project Contract, the undersigned shall assume and do hereby assume all the obligations of the "Operator" under the said Exploration Project Contract to make repayment to the Government according to the terms of the said contract.

This undertaking and covenant shall be binding upon the heirs, successors and assigns of the undersigned.

Dated this _____ day of _____, 1953.

_____ _____

_____ _____

FILE COPY
SURNAME:

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

Martin
Rutledge
Kimball
Hedges
Fletcher
Fitzhugh

June 5 1953

Mr. William M. Hayden, President
Chemetals Corporation
488 Madison Avenue
New York 22, New York

Re: Docket No. DMA 1829X - Manganese
Utah Construction Co. and Associates
Aitken County, Minnesota

Dear Mr. Hayden:

Under separate cover we are writing to you about certain details of property ownership and related subjects under the captioned application for exploration assistance.

We understand also from previous conversations with Mr. C. H. W. Beardsley that your estimate, headed "Second Draft - Exploration Expense - March 11, 1952," will be revised to exclude all items other than those which we could accept as "necessary, reasonable, direct cost" under Section 9(a) of DMEA Order-1. For your convenience we enclose a copy of that order, as amended.

It will be appreciated if you can arrange to submit the revised costs promptly in order that we may be able to continue our consideration of your application, in the light of present conditions, at the same time that you are obtaining the data requested in our above-mentioned letter.

Sincerely yours,

G. O. Mittendorf

Administrator

6-8-53

Enclosure

CC: Docket
CODE 400
FIELD TEAM, REGIONV
OPER. COMMITTEE
ADM. READ. FILE
N. B. MELCHER, USBM
M. D. CRITTENDEN, USGS
Utah Construction Co., 1 Mont. St., San Francisco 4, Calif.

WSMartin/ls 6/5/53

400

FILE COPY
SURNAME:

Rutledge
Martin
Selfridge

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

Utah Construction Company
and Associates
1 Montgomery Street
San Francisco 4, California

Re: Docket No. 1829 - Manganese
Section 23, T. 48 N., R. 27 W.
Aitkin County, Minnesota

Gentlemen:

This will acknowledge your letter of April 23, 1953, requesting us to hold your application for exploration assistance on the subject property in abeyance until you have secured a development and/or production commitment from the Government. You also stated that you plan to submit a revised application when you reactivate this proposal.

The referenced application was made July 2, 1951; an amended program was submitted in August 1951 and the application has been held in abeyance since shortly thereafter. We wish to cooperate fully in the matter of allowing ample time for the submission of a revised program, but if the revised program is not submitted by June 30, 1953, we will then remove the referenced application from the active file and consider the matter closed.

If the subject docket should be closed for this reason, however, it would be without prejudice, and the information contained therein would still be available in the event that a revised application should later be submitted.

Sincerely yours,

Not used

Administrator

FARutledge/ls
4/30/53

Copy to: Docket
Admn. Read. File
Code 400
Field Team, Region 5
N. B. Melcher, USBM
M. D. Crittenden, USGS

ENGINEERS CONTRACTORS

UTAH CONSTRUCTION COMPANY

ONE MONTGOMERY STREET · SAN FRANCISCO 4, CALIFORNIA
CABLE ADDRESS: UTAHCONCO

April 23, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
APR 27 1953

WSM

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

Re: Docket No. 1829 - Manganese
Section 23, T. 48 N., R. 27 W.
Aitkin County, Minnesota

Gentlemen:

This is in reply to your letter of March 30, 1953, in which you requested us to withdraw our application for exploration assistance in the event we no longer desired this assistance.

We still intend to resubmit our proposal for this project which involves a request for assistance from the Defense Materials Procurement Agency, or its successor in the reorganized agency. As soon as the organization is clarified in Washington we will put our proposal forward again, and for this reason we request that you please hold our application on file as a potentially active undertaking.

Yours very truly,

J. K. Allen

J. K. Allen

JKA:mf

400

FILE COPY
SURNAME:

Rutledge
Martin

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

Utah Construction Company
and Associates
1 Montgomery Street
San Francisco 4, California

Re: Docket No. 1829 - Manganese
Section 23, T. 48 N., R. 27 W.
Aitkin County, Minnesota

not mailed

Gentlemen:

Reference is made to your application for exploration assistance at the subject property. On March 30, 1953, we wrote and requested that if you were no longer interested in exploration assistance, it would be appreciated if you would withdraw the referenced application inasmuch as your proposal was contingent upon a Defense Materials Procurement Agency contract. To date we have had no reply.

We wish to cooperate fully in the matter of allowing ample time, but if we do not hear from you by May 31, 1953, we will then remove the referenced application from the active file and consider the matter closed.

Sincerely yours,

Administrator

FARutledge/ls
4/27/53
cc: Docket
Field Team, Reg. 5
N. B. Melcher, USBM
M. D. Crittenden, USGS
Code 400
Adm. Read. File

FILE COPY
SURNAME:

Selfridge
Martin

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

Utah Construction Company
and Associates
1 Montgomery Street
San Francisco, California

MAR 30 1953

J. C. 3/30/53

Re: Docket No. 1829 - Manganese
Section 23, T. 48 N., R. 27 W.
Aitkin County, Minnesota

Gentlemen:

Early this month Mr. J. A. Mecia, of your Company, telephoned this office to inquire if DMEA funds had been frozen as had Defense Materials Procurement Agency's funds. He was informed that they had not been frozen.

Through previous conversations and by letter of July 21, 1952, from Mr. J. K. Allan to this Administration, it is our understanding that your proposal for exploration assistance is contingent upon acceptance of a proposal to DMPA.

Because Mr. Mecia was told that DMPA funds were frozen, it is assumed that you are no longer interested in the proposed exploration assistance. If this is true, will you please notify us to that effect by requesting that your application be withdrawn from our active file.

Sincerely yours,

C. O. Mittendorf

Administrator

GCSelfridge/pn 3-27-53

Copy to: Mails & Files
G. C. Selfridge
N. B. Melcher, BM
M. D. Crittenden, USGS
Field Team, Region III (2)
Admin. Reading File

wrong
Should be Reg. 5

Docket

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

March 5, 1953

Memorandum

To: The Docket

From: G. C. Selfridge

Subject: Docket No. 1829 - Manganese
Section 23, T.48N., R27W
Aitken County, Minnesota

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 6 1953

Utah Construction Co.

Mr. Mecia telephoned today to ask if DMEA funds for exploration had been frozen.

He was informed that they had not been frozen.

He was inquiring because Mr. Young had told him that DMPA funds had been temporarily frozen.

G. C. Selfridge

G. C. Selfridge

FILE COPY
SURNAME:

Selfridge

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

March 5, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 6 1953

Memorandum

To: The Docket

From: G. C. Selfridge

Subject: Docket No. 1829 - Manganese
Section 23, T.48N., R27W
Aitken County, Minnesota

Mr. Macia telephoned today to ask if DMEA funds for exploration had been frozen.

He was informed that they had not been frozen.

He was inquiring because Mr. Young had told him that DMPA funds had been temporarily frozen.

G. C. Selfridge

GCSelfridge/pa 3-6-53

cc: Mails & Files
Admin. Reading File
Mr. Selfridge
Mr. Martin
Mr. Mittendorf

Mr. Selfridge:

1829- Utah Const. Co.

Application dated 7-11-51.

Held up pending DMPA decision so applicant says. Can't we close it out & let applicant file again if & when in position to accept a loan, if warranted?

L S

Hold up till Spring per DCS.

3D

ENGINEERS CONTRACTORS

7/24/52

UTAH CONSTRUCTION COMPANY

ONE MONTGOMERY STREET • SAN FRANCISCO 4, CALIFORNIA

CABLE ADDRESS: UTAHCONCO

July 21, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
[illegible]
JUL 24 1952

Mr. G. C. Selfridge, Chief
Iron and Ferro-Alloy Division
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No. 1829X - Manganese
Section 23, T. 48 N., R. 27 W.
Aitkin County, Minnesota

Dear Mr. Selfridge:

Thank you for your letter of July 3rd in which you inquired about the status of our application for financial assistance to explore Section 23 in Aitkin County, Minnesota.

Inasmuch as our proposal to you is contingent upon acceptance of a proposal to the Defense Materials Procurement Administration, we have been attempting for several months to conclude that phase of our program. We are still actively engaged in attempting to finalize our arrangements with DMPA and for that reason we desire that you hold open the application which we submitted to you. We will advise you as soon as action has been taken by DMPA.

Yours very truly,

J. K. Allen

J. K. Allen

JKA:fd

400

FILE COPY
SURNAME:

Selfridge
Watt

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

JUL 3 1952

Utah Construction Company
and Associates
1 Montgomery Street
San Francisco, California

Re: Docket No. 1829X - Manganese
Section 23, T. 48 N., R. 27 W.
Aitkin County, Minnesota

Gentlemen:

Several months have passed since Mr. Beardsley of your Company was last in this office, at which time he indicated your intention to submit an amended application. We would like to clear our files of the old DMA dockets as soon as possible. Will you please inform us whether or not you intend to proceed with the application? We would appreciate hearing from you at your earliest convenience.

Sincerely yours,

P.N. 7-3-52

G. C. Selfridge, Chief
Iron and Ferro-Alloy Division

GCSelfridge:ls 7/2/52

CC: Admn. Reading File
Docket
G. C. Selfridge
N. B. Melcher, USBM
M. D. Crittenden, USGS
Field Team, Region 5

3/25

Mr. Selfridge:

I question just what status is on this docket. Apparently a loan is not possible, for exploration at least. From the Region V, B/M's letter of 2/25/52, possibly you wish to await results of further sampling--but does B/M letter indicate further sampling will be done? If so, how long should docket be held ~~xxxx~~ pending and on what date do you wish it again brought to your attention for follow-up? Or should applicant immediately be advised that his request for a loan is "no go?"

LS

Have amended application to submit. Should have been here.

6/30/52

Three months have passed--still no amended application — what now?

ls

Utah Construction DMA 1829

March 21, 1951 Report of Bur of Mines Region V
Bur was going to drill 17 more holes for indicated ore in Sec 23 and into sec 1, T136 N, R25 W for SW Block A measured. 33,500,000 L.T (16 cu ft/ton) 185' - 3.28 Mn

B	indicated	10,300,000	✓	✓
C	✓	6,000,000	✓	✓
D	✓	12,700,000	✓	✓
E	✓	13,400,000	165'	2.12
F	✓	4,450,000	165'	2.12
		46,850,000		2.84
Total		80,350,000	181'	3.02

Cut off 1.5 oz

Inferred	75,000,000	est.	±3.00
Total	155,350,000	✓	✓

Overburden 23,790,000 cu yds land.
~~16,550,000~~ ✓ ✓ Measured
40,340,000 ✓ ✓ Total.
35,000,000 cu yds for inferred stripping

Quantsoco spectrography and metallurgy.

Values used came from 5 Hanna & 7 Bur holes. Others too high sulfed.

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

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, $300
(PMGC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

~~CENTRAL~~ REGION V
N. Dak. S. Dak. Neb.
Iowa, Minn. Wis. Mich.

University campus
NORTH CENTRAL EXPERIMENT STATION
MINNEAPOLIS, MINNESOTA 14

107 Mines Experiment Bldg.

Air Mail

February 25, 1952

Mr. G. C. Selfridge, Chief
Iron and Ferro-Alloy Division
Defense Minerals Administration
United States Department of the Interior
Wahhington 25, D. C.

Re: Docket No. DMA 1829X - Manganese
Sec. 23, T. 48 N., R. 27 W.
Utah Construction Co. & Assoc.
Aitken county, Minnesota

Dear Mr. Selfridge:

In reply to your undated letter regarding overall manganese recovery from drill core samples, I regret that we cannot give you an accurate estimate at this time.

Overall manganese recoveries varied between 50 and 75 percent depending on physical structure of each core and grade of concentrate produced. In most of the tests the manganese recovery decreased rapidly as the grade of concentrate rose above 18 to 22 percent manganese.

Samples of run-of-mine material are needed if we are to obtain a more accurate estimate of manganese recovery.

Sincerely yours,

C. E. Wood

C. E. WOOD, Chief
Metallurgical Division
Region V

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 26 1952

BUY UNITED STATES ~~WAR~~ BONDS AND STAMPS

400
FILE COPY
SURNAME:

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

Selfridge
MLO

FEB 21 1952

Mr. C. E. Wood, Chief
Metallurgical Division, Region V
Bureau of Mines
107 Mines Experiment Building
Minneapolis 14, Minnesota

Re: Docket No. DMA 1829X - Manganese
Sec. 23, T. 48 N., R. 27 W.
Utah Construction Co. & Associates
Aitken County, Minnesota

Dear Mr. Wood:

Thank you for your informative letter of February 12, 1952, subject above.

Was sufficient core material available to obtain information covering overall recovery of manganese by the combination of mineral dressing operations mentioned in the next to last paragraph of your letter? It would be interesting to know the indicated recovery so that it could be compared with the overall recovery reported by the applicant.

Sincerely yours,

George C. Selfridge
2/21/52

G. C. Selfridge, Chief
Iron and Ferro-Alloy Division

GCSelfridge:ls
2/20/52

cc: Admn. Reading File
Docket
G. C. Selfridge

BL

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Minn. Wis. Mich.
~~CENTRAL~~ REGION V
N. Dak. S. Dak. Neb. Iowa,
Air Mail

University campus
NORTH CENTRAL EXPERIMENT STATION
MINNEAPOLIS, MINNESOTA 14

107 Mines Experiment Bldg,

Mr. G. C. Selfridge, Acting Chief
Iron and Ferro-Alloy Division
Defense Minerals Administration
United States Dept. of the Interior
Washington 25, D. C.

February 12, 1952

Defense Minerals Administration
RECEIVED
FEB 18 1952

Re: Docket No. DMA 1829X - Manganese
Sec. 23, T48, N.R. 27W
Utah Construction Co. and Associates
Aitken county, Minnesota

Dear Mr. Selfridge:

A progress report covering the results of tests made on the manganese ore referred to in the subject docket has been started. As it will be sometime before it is completed I believe it is advisable to send you a brief summary of the results of this work.

Mineral dressing tests have been made on a total of seven diamond drill cores furnished by the Mining Division. The exact location of each drill hole may be found in the files of the Bureau of Mines, Washington, D. C.

The iron-manganese formation in the area drilled was quite variable in composition as revealed by chemical analysis of the drill cores. Core recovery was irregular and in those instances where the recovery was less than 90 percent, sludge from the hole was included in the composite sample prepared from each core. This type of sample is suitable only for preliminary mineral dressing studies and should be supplemented by trench or pit samples if an accurate estimate of the mineral dressing problems involved are to be determined.

Partial analysis of the composite samples are as follows:

D.D. Hole Number	Assay, percent Mn	Fe	SiO_2
1	3.60	11.8	46.4
2	1.98	11.56	42.1
3	3.08	11.96	52.5
4	3.34	13.34	48.9
5	3.46	13.18	45.8
6	3.30	12.21	52.1
7	2.62	14.96	52.6
	3.05		

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

estimate recovery see page 2.

The first step in upgrading this material was a simple washing and desliming operation on the minus 10 mesh feed. Sieve analyses had shown that a soft clayey fraction of the formation contained less manganese than the harder minerals. The weight recovery, manganese recovery, and assay obtained on each washed concentrate follow:

D.D. hole number	Wt. recovery, percent	Mn recovery, percent	Assay, percent		
			Mn	Fe	SiO_2
1	63.0	95.1	5.5	15.2	45.7
2	58.7	81.8	2.76	12.44	52.5
3	47.2	76.0	4.96	13.65	52.9
4	57.8	83.1	4.80	14.37	50.6
5	58.5	87.9	5.20	15.42	45.5
6	58.2	91.0	5.16	13.08	53.3
7	55.6	82.3	3.88	16.15	53.8
	57.0	85.3	4.61		

The highest weight recovery, manganese recovery, and manganese assay were obtained from composite No. 1 which contained no sludge. All sludge recovered with the drill core had been subjected to overgrinding by the diamond drill and undoubtedly more manganese was lost in the washing operation than in the tests which contained no sludge.

Further upgrading of the washed concentrates or sands was obtained by a combination of mineral dressing operations which included the use of a classifier tube, Denver laboratory jig, Wilfley table, heavy density media and froth flotation. In no instance was it possible to separate the manganese from the iron and silica to the degree required for a ferrograde product. However, the results show that a product containing between 22 and 26 percent manganese, 13 to 15 percent iron, and 11.5 to 13.0 percent silica may be produced.

Because of the limited amount of sample available from each core these tests are only indicative of what may be expected and the results should be confirmed by larger scale tests as soon as more material can be obtained. Preliminary results however are very encouraging for the production of a marketable manganiferous product and a reasonable recovery of manganese. The production of a ferrograde product will require further treatment by a leaching process or by a duplex smelting process.

Sincerely yours,

C. E. Wood

C. E. WOOD, Chief
Metallurgical Division, Reg.V

Copies to:
P. T. Allsman, director, Reg.V
A. B. Needham, chief, Min. Division, Reg.V
W. E. Lewis, Mining Engineer, Region V

RECEIVED
FEB 14 1952
DEPT. OF INTERIOR
BUREAU OF MINES
MINNEAPOLIS, MINN.
REGION V

FILE COPY
SURNAME:

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

Gentry
Selfridge
Wilkening

Mr. Carl E. Wood, Chief
Metallurgical Division, Region V
U. S. Bureau of Mines
University Station
Minneapolis, Minnesota

JAN 30 1952

Re: Docket No. DMA 1829X - Manganese
Sec. 23, T48, R27W
Utah Construction Co. and Associates
Aitkin County, Minnesota

Dear Mr. Wood:

This office understands that the Metallurgical Division of Region V is conducting tests on the manganese ore referred to in the subject docket.

When the results of this test are available, we shall appreciate receiving a copy of your report.

Sincerely yours,

G. C. Selfridge, Acting Chief
Iron and Ferro-Alloy Division

GGGentry'lm
1/28/52

cc: Admn. Reading File
1-30 Docket
T. D. N. B. Melcher, USBM
M. D. Crittenden, USGS
Field Team Reg. V
G. C. Selfridge
G. G. Gentry

File stripped of legal documents on June 30, 1952 by Selfridge for Beardsley for new applications.

Follow up

What now!

1-28-52 Letter to Metallurgical Division, Region V, Requesting copy of their Report.

{Hold up application until the Metallurgical Report is Received.
G.G.

George S, in a conference with (C) of this Co - objected to high ($15,000.00) salaries - (what happened then?)

Original App 7/11 (incl assignment + subordination) (see other files + Envelopes)

Amended 8/7
Incl new Contract forms + letters (photostats) from drilling Co.

Aug 16 - letter from Chemico - re recovery Process

July 7 and Aug 23 - USGS - Critten den - approving Project

Aug 30 - approved - Selfridge for P.I.E.D.

Nov 27 - rendered inactive by Blakemore - on Metallurgical grounds -

JAB 1/5

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

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, $300
(PMGC)

Docket DMA 1829X

Drilling to date shows 38 ,000,000 tons of ore averaging 3-3/4 percent manganese.

Area proposed to be drilled by applicant lies between two drilled zones and could be considered as probable pre. Hence it would be considered as development rather than exploration.

It is proposed by the applicant to operate on a basis of 2,500,000 tons per year. The 38,900,000 tons already developed is sufficient for a 25 year operation. Hence further exploration or development is not warranted at the present time.

The proposed shaft is for the purpose of obtaining a large sample for metallurgical tests . Hence it cannot be justified under the head of exploration. The cost of obtaining a 1,200 ton sample by this method is estiamted to be about $160,000.00 E.J.Longyear proposes taking a 100 tons sample by means of 5 or 6 18 inch holes. The holes to be churndrilled 150 feet to bedrock, then a core could be taken of ore by shot drills. They estimate that this cost would be about $90,000.00;. As this would not be exploration, any loan would have to come under the head of research.

22 tons per hole

Tests on this ore are now being carried on by the Metallurgical Division of the Bureau of Mines at Minneapolis. The present status of this work should be obtained from Carl E.Wood, Chief, Metallurgical Division, Region V. University Station, Minneapolis, Minn.

TLC

Thos.L.Chapman

OFFICE OF THE ADMINISTR

Sockell to MTR

400

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

November 27, 1951

Noted
Com

Memorandum

To: Administrator

From: P. B. Blakemore PBB

Subject: Docket DMA 1829X, Cuyuna Manganese, Minnesota
Utah Construction Company and Associates
Total $250,000.00 Gov't. Share $187,500.00 (75%)

The subject application was approved by Supply Division's letter of September 5, 1951 and received by PED on the same date.

Inasmuch as 37,800,000 gross tons of manganiferous material (3-3/4% Mn) appears to have already been proven in this deposit, the additional churn and core drilling, shaft sinking and drifting applied for could not be justified as exploration and Mr. Hayden, a representative of one of the interests, was so advised during a visit in your office.

Mr. C. T. E. Beardsley, representing another interest was also advised that the application could not be handled as exploration, but that it might be handled as a Research Loan.

The facts are, that this manganiferous material cannot be mechanically concentrated to yield a concentrate containing more than 20% Mn plus a large percentage of silica. This concentrate would not be merchantable, therefore it is proposed to treat it in an elaborate chemical plant, with sulphur dioxide and pure oxygen, under high pressure (600 psi) at elevated temperatures, so as to extract, it is claimed, with high recovery, the manganese in the form of manganese sulphate. The manganese sulphate is then to be sintered to produce a very pure, merchantable, manganous oxide. It is planned to recover a portion of the sulphur dioxide from the sintering process for re-use.

Inasmuch as no pilot plant has ever been constructed, or any plant operated, which would demonstrate the commercial value of this process, it is evident that the first step would be to establish operating factors and cost data for the chemical processing by operating a miniature of the plant proposed.

The problem is not to discover additional manganiferous material, but to determine if it is possible to recover the manganese in a merchantable form from the large proven reserves at a cost which would amortize the very large investment, assuming a G. S. A. purchase at $200.00 g. t., 48% Mn. basis.

A loan for research along these lines appears to be the only form of Governmental assistance which can be justified under such circumstances.

Other items to be considered:

1. The property is not correctly described in the lease and option.

2. The primary lessees, Todd and Scallon, charge the first sub-lessees royalty on ore shipments which is from 3 to 6 times that which they are obligated to pay the owner and require a minimum royalty five times that required by the owner. This appears unwarranted.

3. The Utah Construction Co. and Associates, second sub-lessees, have not furnished any evidence, other than their statement and the subordination agreement, that they are (sub-sub) lessees of the property. Copy of lease to Utah Construction has not been furnished.

4. The signature of the Landlord on the subordination agreement made directly to Utah Construction Co. and Associates does not correspond in title to that used in the primary lease, though the individuals signing for the landlord are the same on both instruments.

5. While the applicants are very competent contractors, expert in earth moving, they have not furnished evidence of their talent for conducting very intricate, novel and complex chemical operations and estimating theoretical costs thereof.

Recommendation:

Application to Inactive File.

P. B. Blakemore

400E COPY
SURNAME:

Blakemore

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

November 27, 1951

Memorandum

To: Administrator

From: P. B. Blakemore

Subject: Docket DMA 1829X, Guyuna Manganese, Minnesota
Utah Construction Company and Associates
Total $250,000.00 Gov't. Share $187,500.00 (75%)

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Mr. C. T. E. Beardsley, representing another interest was also advised that the application could not be handled as exploration, but that it might be handled as a Research Loan.

The facts are, that this manganiferous material cannot be mechanically concentrated to yield a concentrate containing more than 20% Mn plus a large percentage of silica. This concentrate would not be merchantable, therefore it is proposed to treat it in an elaborate chemical plant, with sulphur dioxide and pure oxygen, under high pressure (600 psi) at elevated temperatures, so as to extract, it is claimed, with high recovery, the manganese in the form of manganese sulphate. The manganese sulphate is then to be sintered to produce a very pure, merchantable, manganous oxide. It is planned to recover a portion of the sulphur dioxide from the sintering process for re-use.

Inasmuch as no pilot plant has ever been constructed, or any plant operated, which would demonstrate the commercial value of this process, it is evident that the first step would be to establish operating factors and cost data for the chemical processing by operating a miniature of the plant proposed.

The problem is not to discover additional manganiferous material, but to determine if it is possible to recover the manganese in a merchantable form from the large proven reserves at a cost which would amortize the very large investment, assuming a G. S. A. purchase at $200.00 g. t., 48% Mn. basis.

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5. While the applicants are very competent contractors, expert in earth moving, they have not furnished evidence of their talent for conducting very intricate, novel and complex chemical operations and estimating theoretical costs thereof.

Recommendation:

Application to Inactive File.

N. S
R+R

P. B. Blakemore

PBBlakemore/meh
11-27-51
cc to: Reports and Records
Docket
Mr. Blakemore

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

DEPARTMENT OF THE INTERIOR
RECEIVED
SEP 6 1951
Defense Minerals Administration,
Production Expansion Division.

SEP 5 1951

Memorandum

To: Production Expansion Division

Through: Director, Supply Division

From: Chief, Manganese Branch

Subject: DMA-1829X (Exploration Loan-Government participation ($182,500.00) 187,500 = 75%
Utah Construction Company and Associates
1 Montgomery Street
San Francisco, California

Property: Cuyuna Manganese
Section 23, T48N, R27W
Aitkins County, Minnesota

Conclusions:

The Utah Construction Company and Associates are preparing to undertake a very large project for the development, mining and treatment of manganese ores in a part of the Cuyuna Range, Minnesota.

This will involve the stripping of 150 feet of overburden which consists of loam, clay, sand, gravel, and boulders. This will allow the ore body, which averages 150 feet in thickness, to be mined by the open pit method of mining. The chief gangue material is clay. The ore is manganese and iron oxides.

The exploration is to be made for extensions of a manganese orebody parts of which have been penetrated by 40 churn drill and 7 diamond core holes. It is now proposed to drill 40 more holes, the location of the first 8 drill holes is shown in the attached map. The other 32 holes are to be located after the results of the first holes have been observed. In addition, it is proposed that an exploratory shaft be sunk to gain further information on the character of the ore.

The monetary requirements as set forth by the applicant are as follows:

Exploration Drilling	
8,000' churn drill holes @ $7.00 per foot	56,000.00
4,000' N.X. core drill holes @ $8.00 per foot	32,000.00
Exploration Shaft	
Using freezing method (8 months)	120,000.00
Exploration drifts (12 months)	36,000.00
Access roads	6,000.00
	$250,000.00

Of this amount, the Government's part would be $182,500.00. 187,500 75%

The applicant believes there may be an indicated tonnage in the order of magnitude of 62,000,000 tons. The applicant intends to mine 2,500,000 tons per year. This will be concentrated to 20% manganese with an 80% recovery. This would mean 333,333 long tons of 20% concentrate per year. From this 20% concentrate a 62% sintered manganese oxide will be obtained by a modified sulphur dioxide leaching process. Mr. William Hayden of the Chemetals Corporation suggests that a recovery of around 95% may be expected. Using a figure of 90% recovery and a 60% manganese sinter, the 333,333 tons of 20% concentrate would produce approximately 100,000 tons of manganese. This is 6.7% of our manganese consumption for 1945.

Mr. Crittenden, in a memorandum to the Manganese Branch, refers to a reappraisal of available information by Mr. Frank Grout, in which Mr. Grout inferred that there might be as much as 150,000,000 tons of material in the deposit. This proposed drilling should indicate this additional tonnage.

The mining method to be used is the open pit. The applicant gives his mining costs as:

Stripping	$.40 per cubic yard or $.32 per ton mined	
Mining	$.60 per cubic yard or $.30 per ton mined	
Total costs		$.62 per ton mined

Milling will be carried on in a gravity concentrating plant. The cost of concentrating in this gravity plant has been estimated by the applicant to be $.21 per ton of ore mined or $1.40 per ton of 20% concentrate shipped. Total cost of the 20% concentrates is given at $5.58.

The problem of marketing the product seems to be a very simple affair. Routes already established for the shipment of the Cuyuna iron ores could be used for the shipment of the manganese which will go largely to the same points as the iron ore.

The company plans to spend about 24 months on this exploration.

The applicant has taken bids on the work from contracting companies. Therefore, no new facilities or equipment will be needed. Of the total amount $6,000 has been allocated for access roads. This should be ample. The manpower requirements will be met by the contracting companies who will have their own drillers and technical personnel.

Power is available from the Minnesota Power and Light Company's grid which is less than 6 miles distant.

The amount of money requested for the exploration is $182,500. 187,500 The amount is believed to be adequate. The company balance shee~~t is~~ incorporated in the report of the company which is hereto attached. The security of the loan would be unquestioned. Repayment of the loan could come from operational profits.

The applicant is well-known in the mining and construction fields as a competent operator.

Recommendation:

The application is approved.

George C. Selfridge

George C. Selfridge, Acting
Chief, Manganese Branch

Attachment

Approved:

Sam Lyon

Director, Supply Division

FILE COPY
SURNAME

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

SEP 5 1951

Memorandum

To: Production Expansion Division

Through: Director, Supply Division

From: Chief, Manganese Branch

Subject: DMA-1827A (Exploration Loan-Government participation $182,500.00)
Utah Construction Company and Associates
1 Montgomery Street
San Francisco, California

Property: Cuyuna Manganese
Section 23, T48N, R27W
Aitkins County, Minnesota

Conclusions:

The Utah Construction Company and Associates are preparing to undertake a very large project for the development, mining and treatment of manganese ores in a part of the Cuyuna Range, Minnesota.

This will involve the stripping of 150 feet of overburden which consists of loam, clay, sand, gravel, and boulders. This will allow the ore body, which averages 150 feet in thickness, to be mined by the open pit method of mining. The chief gangue material is clay. The ore is manganese and iron oxides.

The exploration is to be made for extensions of a manganese orebody parts of which have been penetrated by 40 churn drill and 7 diamond core holes. It is now proposed to drill 40 more holes, the location of the first 8 drill holes is shown in the attached map. The other 32 holes are to be located after the results of the first holes have been observed. In addition, it is proposed that an exploratory shaft be sunk to gain further information on the character of the ore.

A.E.C.

The monetary requirements as set forth by the applicant are as follows:

Exploration Drilling	
8,000' churn drill holes @ $7.00 per foot	56,000.00
4,000' N.X. core drill holes @ $8.00 per foot	32,000.00
Exploration Shaft	
Using freezing method (8 months)	130,000.00
Exploration drifts (12 months)	36,000.00
Access roads	6,000.00
	$250,000.00

Of this amount, the Government's part would be $182,500.00.

The applicantbelieves there may be an indicated tonnage in the order of magnitude of 60,000,000 tons. The applicant intends to mine 2,500,000 tons per year. This will be concentrated to 20% manganese with an 80% recovery. This would mean 333,333 long tons of 20% concentrate per year. From this 20% concentrate a 62% sintered manganese oxide will be obtained by a modified sulphur dioxide leaching process. Mr. William Hayden of the Chemetals Corporation suggests that a recovery of around 95% may be expected. Using a figure of 90% recovery and a 60% manganese sinter, the 333,333 tons of 20% concentrate would produce approximately 100,000 tons of manganese. This is 6.7% of our manganese consumption for 1945.

Mr. Whitlenden, in a memorandum to the Manganese Branch, refers to a resurvey of available information by Mr. Frank Grant, in which Mr. Grant inferred that there might be as much as 150,000,000 tons of material in the deposit. This proposed drilling should indicate this additional tonnage.

The mining method to be used is the open pit. The applicant gives his mining costs as:

Stripping	$.40 per cubic yard or $.32 per ton mined	
Mining	$.60 per cubic yard or $.30 per ton mined	
Total costs		$.62 per ton mined

Milling will be carried on in a gravity concentrating plant. The cost of concentrating in this gravity plant has been estimated by the applicant to be $.21 per ton of ore mined or $1.40 per ton of 20% concentrate shipped. Total cost of the 20% concentrates is given at $5.58.

The problem of marketing the product seems to be a very simple affair. Contracts already established for the shipment of the Cuyuna iron ores could be used for the shipment of the manganese which will go largely to the same points as the iron ore.

The company plans to spend about 24 months on this exploration.

The applicant has taken bids on the work from contracting companies. Therefore, no new facilities or equipment will be needed. Of the total amount $6,000 has been allocated for access roads. This should be ample. The manpower requirements will be met by the contracting companies who will have their own drillers and technical personnel.

Power is available from the Minnesota Power and Light Company's grid which is less than 6 miles distant.

The amount of money requested for the exploration is $182,500. The amount is believed to be adequate. The company balance sheet is incorporated in the report of the company which is hereto attached. The security of the loan would be unquestioned. Repayment of the loan could come from operational profits.

The applicant is well-known in the mining and construction fields as a competent operator.

not stripped in R&R.

Recommendation:

The application is approved.

George C. Selfridge

George C. Selfridge, Acting
Chief, Manganese Branch

Attachment

Approved:

Tom Lyon

Director, Supply Division

CHJacoby:ec
August 30, 1951

CC: Adm. Reading File
Reports & Records Unit
Regional Field Team Region V
Mr. Holderer
Mr. Crittenden
Mr. Melcher
Files

Reports records 340

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

SEP 5 1951

Memorandum

To: Production Extension Division

Through: Director, Supply Division

From: Chief, Manganese Branch

Subject: [illegible]-1822[illegible] (Exploration Loan-Government Participation 182,500.00)
Utah Construction Company and Associates
1 Montgomery Street
San Francisco, California

Property: Cuyuna Manganese
Section 23, T48N, R27W
Aitkins County, Minnesota

Conclusions:

The Utah Construction Company and Associates are preparing to undertake a very large project for the development, mining and treatment of manganese ores in a part of the Cuyuna range, Minnesota.

This will involve the stripping of 150 feet of overburden which consists of loam, clay, sand, gravel, and boulders. This will allow the ore body, which averages 150 feet in thickness, to be mined by the open pit method of mining. The chief gangue material is clay. The ore is manganese and iron oxides.

The exploration is to be made for extensions of a manganese orebody parts of which have been penetrated by 40 churn drill and 7 diamond core holes. It is now proposed to drill 40 more holes, the location of the first 8 drill holes is shown in the attached map. The other 32 holes are to be located after the results of the first holes have been observed. In addition, it is proposed that an exploratory shaft be sunk to gain further information on the character of the ore.

a.4.c.

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Exploration drilling	
8,000' churn drill holes @ $7.00 per foot	56,000.00
4,000' N.X. core drill holes @ $8.00 per foot	32,000.00
Exploration shaft	
Using freezing method (8 months)	150,000.00
Exploration drifts (12 months)	36,000.00
Access roads	6,000.00
	$350,000.00

Of this amount, the Government's part would be $182,500.00.

The applicant believes there may be an indicated tonnage in the order of magnitude of 6[illegible],000,000 tons. The applicant intends to mine 2,500,000 tons per year. This will be concentrated to 20% manganese with an 80% recovery. This would mean 333,333 long tons of 20% concentrate per year. From this 20% concentrate a 62% sintered manganese oxide will be obtained by a modified sulphur dioxide leaching process. Mr. William Hayden of the Chemetals Corporation suggests that a recovery of around 95% may be expected. Using a figure of 80% recovery and a 40% manganese sinter, the 333,333 tons of 20% concentrate would produce approximately 100,000 tons of manganese. This is 6.7% of our manganese consumption for 1945.

Mr. Whitehead, in a memorandum to the Enclosure Branch, refers to a reappraisal of available information by Mr. Frank Grant, in which Mr. Grant inferred that there might be as much as 150,000,000 tons of material in the deposit. This proposed drilling should indicate this additional tonnage.

The mining method to be used is the open pit. The applicant gives his mining costs as:

Stripping	$2.40 per cubic yard or $1.32 per ton mined	
Mining	$1.60 per cubic yard or $0.90 per ton mined	
Total costs		$2.22 per ton mined

Milling will be carried on in a gravity concentrating plant. The cost of concentrating in this gravity plant has been estimated by the applicant to be $.21 per ton of ore mined or $1.[illegible] per ton of 20% concentrate shipped. Total cost of the 20% concentrates is given at $5.58.

The problem of marketing the product seems to be a very simple affair. Routes already established for the shipment of the Tuyuna iron ores could be used for the shipment of the manganese which will go largely to the same points as the iron ore.

The company plans to spend about 24 months on this exploration.

The applicant has taken bids on the work from contracting companies. Therefore, no new facilities or equipment will be needed. Of the total amount $6,000 has been allocated for access roads. This should be ample. The manpower requirements will be met by the contracting companies who will have their own drillers and technical personnel.

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The applicant is well-known in the mining and construction fields as a competent operator.

Recommendation:

The application is approved.

not stripped in R. + R.

George C. Selfridge

George C. Selfridge, Acting
Chief, Manganese Branch

Attachment

Approved:

Tom Lyon

Director, Supply Division

CWJacoby:ec
August 30, 1951

CC: Adm. Reading File
Reports & Records Unit
Regional Field Team Region V
Mr. Holderer
Mr. Crittenden
Mr. Melcher
Files

Mr. Holdeer 3624

SEP 5 1951

Memorandum

To: Conservation Operation Division

Through: Director, Supply Division

From: Chief, Manganese Branch

Subject: [illegible] Exploration Loan-Government Participation
[illegible]
Utah Construction Company and Associates
[illegible] Montgomery Street
[illegible], California

Property: Cayuna Range
Section [illegible], [illegible], [illegible]
Aitkin County, Minnesota

Conclusions:

The Utah Construction Company and associates are proceeding to undertake a very large project for the development, mining and treatment of manganese ores in the part of the Cayuna Range, Minnesota.

This will involve the stripping of [illegible] feet of overburden which consists of loam, clay, sand, gravel, and boulders. This will allow the ore body, which averages [illegible] feet in thickness, to be mined by the open pit method of mining. The chief gangue material is clay. The ore is manganese and iron oxides.

The exploration is to be made for extensions of a manganese orebody parts of which have been penetrated by churn drill and 7 diamond core holes. It is now proposed to drill [illegible] more holes, the location of the first [illegible] drill holes is shown in the attached map. The other [illegible] holes are to be located after the results of the first holes have been observed. In addition, it is proposed that an exploratory shaft be sunk to gain further information on the character of the ore.

The monetary requirements as set forth by the applicant are as follows:

Exploration drilling	
[illegible] churn drill holes [illegible] per foot	56,000.[illegible]
[illegible] core drill holes [illegible] per foot	[illegible]
Exploration drift	
Mining (freezing method 18 months)	[illegible]
Exploration drifts (12 months)	[illegible]
Access roads	[illegible]
	$250,[illegible]

Of this amount, the Government's part would be $[illegible].

The applicant believes there may be an indicated tonnage in the order of magnitude of [illegible],000,000 tons. The applicant intends to mine 2,500,000 tons per year. This will be concentrated to [illegible] manganese with an [illegible] recovery. This would mean [illegible] long tons of [illegible] concentrate per year. From this [illegible] concentrate a [illegible] sintered manganese oxide will be obtained by a modified sulphur dioxide leaching process. Mr. Hilaire Bryan of the Chemetals Corporation suggests that a recovery of around [illegible] may be expected. Using a figure of [illegible] recovery and [illegible] manganese sinter, the [illegible] tons of [illegible] concentrate would produce approximately [illegible] tons of manganese. This is [illegible] of our stockpiled requirements for 1[illegible].

Mr. Mitchell, in a memorandum to the Minister French, refers to a report of available information by Mr. Frank Grout, in which Mr. Grout inferred that there might be as much as 150,000,000 tons of material in the deposit. This proposed drilling should indicate this additional tonnage.

The mining method to be used is the [illegible]. The applicant gives the mining costs as:

Drilling [illegible] per cubic [illegible] or [illegible] per ton mined	
Mining [illegible] per cubic [illegible] or [illegible] per ton mined	
Total costs	[illegible] per ton mined

Milling will be carried on in a gravity concentrating plant. The cost of concentrating in this gravity plant has been estimated by the applicant to be [illegible] per ton of ore mined or [illegible] per ton of [illegible] concentrate shipped. Total cost of the [illegible] concentrate is given at [illegible].

The problem of marketing the product seems to be a very simple affair. Water ore by established for the shipment of the Nyuma iron ores could be used for the shipment of the manganese which will go largely to the same points as the iron ore.

The company plans to spend about 24 months on this exploration.

The applicant has taken bids on the work from contracting companies. Therefore, no new facilities or equipment will be needed. Of the total amount $6,000 has been allocated for access roads. This should be ample. The manpower requirements will be met by the contracting companies who will have their own drillers and technical personnel.

Power is available from the Minnesota Power and Light Company's grid which is less than 6 miles distant.

The amount of money requested for the exploration is $165,500. The amount is believed to be adequate. The company balance sheet is incorporated in the report of the company which is hereto attached. The security of the loan would be unquestioned. Repayment of the loan could come from operational profits.

The applicant is well-known in the mining and construction fields as a competent operator.

Recommendation:

The application is approved.

George C. Selfridge

George C. Selfridge, Acting
Chief, Chemicals Branch

Attachment

Approved:

Director, Supply Division

CHJacobsen
August 20, 1951

CC: Adm. Reading File
Reports & Records Unit
Regional Field Team Region V
Mr. Wolderer
Mr. Crittenden
Mr. Melcher
Files

DMA Form 2

DEFENSE MINERALS ADMINISTRATION
Status Change Notice

DMA Docket No. 1829X

To: Reports and Records Branch

From: Manganese Branch DMA

Date: September 4, 1951

The following action has been taken this date on the above Controlled Document.

Forwarded to Production Expansion Division - through Director, Supply Division

Type of request changed to:

Denied ☐ Withdrawn ☐

Approved in amount of $

Other action, specify:

DMA 1829x

Index of File
to
PRODUCTION EXPANSION DIVISION

1. 3 copies of MF-103 with attached sheets and maps

2. 3 copies of MF-100

3. 3 copies 20 photostates of drill logs with 26 sheets of assays

4. 3 copies MF-200 with attached sheets

5. 3 copies Photostate of Exploration Report

6. 3 copies letter to DMA from Christensen dated 7/2/51

8/30/51

9/5/51

Memorandum

To: Production Expansion Division

Through: Director, Supply Division

From: Chief, Manganese Branch

Subject: DMA-1829X (Exploration Loan-Government participation $182,500.00)
Utah Construction Company and Associates
1 Montgomery Street
San Francisco, California

Property: Cuyuna Manganese
Section 23, T48N, R27W
Aitkins County, Minnesota

Conclusions:

The Utah Construction Company and Associates are preparing to undertake a very large project for the development, mining and treatment of manganese ores in a part of the Cuyuna Range, Minnesota.

This will involve the stripping of 150 feet of overburden which consists of loam, clay, sand, gravel, and boulders. This will allow the ore body, which averages 150 feet in thickness, to be mined by the open pit method of mining. The chief gangue material is clay. The ore is manganese and iron oxides.

The exploration is to be made for extensions of a manganese orebody parts of which have been penetrated by 40 churn drill and 7 diamond core holes. It is now proposed to drill 40 more holes, the location of the first 8 drill holes is shown in the attached map. The other 32 holes are to be located after the results of the first holes have been observed. In addition, it is proposed that an exploratory shaft be sunk to gain further information on the character of the ore.

The monetary requirements as set forth by the applicant are as follows:

Exploration Drilling	
8,000' churn drill holes @ $7.00 per foot	56,000.00
4,000' N.X. core drill holes @ $8.00 per foot	32,000.00
Exploration Shaft	
Using freezing method (8 months)	120,000.00
Exploration drifts (12 months)	36,000.00
Access roads	6,000.00
	$250,000.00

Of this amount, the Government's part would be $182,500.00.

The applicant believes there may be an indicated tonnage in the order of magnitude of 62,000,000 tons. The applicant intends to mine 2,500,000 tons per year. This will be concentrated to 20% manganese with an 80% recovery. This would mean 333,333 long tons of 20% concentrate per year. From this 20% concentrate a 62% sintered manganese oxide will be obtained by a modified sulphur dioxide leaching process. Mr. William Hayden of the Chometals Corporation suggests that a recovery of around 95% may be expected. Using a figure of 90% recovery and a 60% manganese sinter, the 333,333 tons of 20% concentrate would produce approximately 100,000 tons of manganese. This is 6.7% of our manganese consumption for 1945.

Mr. Brittenden, in a memorandum to the Manganese Branch, refers to a reappraisal of available information by Mr. Frank Grant, in which Mr. Grant inferred that there might be as much as 150,000,000 tons of material in the deposit. This proposed drilling should indicate this additional tonnage.

The mining method to be used is the open pit. The applicant gives his mining costs as:

Stripping	$.40 per cubic yard or $.22 per ton mined	
Mining	$.60 per cubic yard or $.20 per ton mined	
Total costs		$.62 per ton mined

Milling will be carried on in a gravity concentrating plant. The cost of concentrating in this gravity plant has been estimated by the applicant to be $.21 per ton of ore mined or $1.40 per ton of 20% concentrate shipped. Total cost of the 20% concentrate is given at $5.58.

The problem of marketing the product seems to be a very simple affair. Routes already established for the shipment of the Guyuna iron ores could be used for the shipment of the manganese which will go largely to the same points as the iron ore.

The company plans to spend about 24 months on this exploration.

The applicant has taken bids on the work from contracting companies. Therefore, no new facilities or equipment will be needed. Of the total amount $6,000 has been allocated for access roads. This should be ample. The manpower requirements will be met by the contracting companies who will have their own drillers and technical personnel.

Power is available from the Minnesota Power and Light Company's grid which is less than 6 miles distant.

The amount of money requested for the exploration is $182,500. The amount is believed to be adequate. The company balance sheet is incorporated in the report of the company which is hereto attached. The security of the loan would be unquestioned. Repayment of the loan could come from operational profits.

The applicant is well-known in the mining and construction fields as a competent operator.

Recommendation:

The application is approved.

George C. Selfridge

George C. Selfridge, Acting
Chief, Manganese Branch

Attachment

Approved:

Director, Supply Division

CHJacoby:ec
August 30, 1951

CC: Adm. Reading File
Reports & Records Unit
Regional Field Team Region V
Mr. Holderer
Mr. Crittenden
Mr. Melcher
Files

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : George B. Holderer DATE: July 16, 1951

FROM : M. D. Crittenden

SUBJECT: DMA 1829 X

The Utah Construction Company and Associates proposes to undertake a very large project for the development, mining and treatment of manganese ores in a part of the Cuyuna Range, Minnesota. The particular orebody concerned is located in Sec. 23, T. 49 N., R. 27 W. This area was partly drilled by the Bureau of Mines and by private companies in search of iron ore. The resulting information was compiled and reappraised by Frank F. Grout, formerly of the Geological Survey, who inferred on the basis of the information available that the deposit might contain as much as 150,000,000 tons of material containing approximately 3.6% manganese. As indicated in the accompanying map, the ore in Sec. 23 is an elongated band 600-1600 ft. wide which extends across the middle of the section in a NE direction. Most of the drilling was done just south and west of the center of the section and defines the southwestern end of block believed to be underlain by ore. Drilling has also been done near the northeast corner of the section but none has been done in the area between to establish the continuity and grade of ore over the intervening distance. It is the purpose of the present proposal to drill out this area, and also to drill beneath the adjoining areas to be certain that they are barren in order to avoid possible location of tailings or waste over material which might some day prove minable.

It is recommended that the project be approved inasmuch as the Cuyuna Range is one of the largest potential sources of manganese in the United States, and it is particularly desirable that companies of the character involved here be encouraged to undertake a project such as this. Some modification of the proposal, as it is now presented, appears to be in order, and it is recommended that such modification be made in negotiating with the applicant by Production Expansion Division. Representatives of the companies involved are available in Washington and in New York and are on call for consultation. The present proposal calls for a total expenditure of $500,000 of which $120,000 is to be spent for exploration drilling, $60,000 for an exploratory shaft and crosscut, and $25,000 for removing metallurgical samples. The remaining $295,000 is designated as research on beneficiation. The latter is probably not a legitimate expenditure under the provisions of the Exploration Program, and therefore should be deleted. The total cost of the project would then be approximately $205,000. A discussion with the engineer for the applicant indicates that any modification necessary to fit the project into the Exploration Program will be readily acceded to. Specific location of drill holes was not indicated on the accompanying map because the engineer did not feel that such spotting provided for sufficient flexibility. He is perfectly willing, however, to spot a part of the holes which could serve as the first phase of the project; spotting of the additional holes could then be deferred pending results of the first group. It is probable that several such sequences may be desirable.

It may be questionable whether additional drilling in areas of proved ore should be included under the guise "exploration", but this problem and that of drilling beneath proposed mill sites and waste piles should probably be left to the Production Expansion Division and to the Legal Division.

MDC

George B. Holderer July 16, 1951

M. D. Crittenden

DMA 1829 X

The Utah Construction Company and Associates proposes to undertake a very large project for the development, mining and treatment of manganese ores in a part of the Cuyuna Range, Minnesota. The particular orebody concerned is located in Sec. 23, T. 49 N., R. 27 W. This area was partly drilled by the Bureau of Mines and by private companies in search of iron ore. The resulting information was compiled and reappraised by Frank F. Grout, formerly of the Geological Survey, who inferred on the basis of the information available that the deposit might contain as much as 150,000 tons of material containing approximately 3.6% manganese. As indicated in the accompanying map, the ore in Sec. 23 is an elongated band 600-1600 ft. wide which extends across the middle of the section in a NE direction. Most of the drilling was done just south and west of the center of the section and defines the southwestern end of block believed to be underlain by ore. Drilling has also been done near the northeast corner of the section but none has been done in the area between to establish the continuity and grade of ore over the intervening distance. It is the purpose of the present proposal to drill out this area, and also to drill beneath the adjoining areas to be certain that they are barren in order to avoid possible location of tailings or waste over material which might some day prove minable.

It is recommended that the project be approved inasmuch as the Cuyuna Range is one of the largest potential sources of manganese in the United States, and it is particularly desirable that companies of the character involved here be encouraged to undertake a project such as this. Some modification of the proposal, as it is now presented, appears to be in order, and it is recommended that such modification be made in negotiating with the applicant by Production Expansion Division. Representatives of the companies involved are available in Washington and in New York and are on call for consultation. The present proposal calls for a total expenditure of $500,000 of which $120,000 is to be spent for exploration drilling, $60,000 for an exploratory shaft and crosscut, and $25,000 for removing metallurgical samples. The remaining $295,000 is designated as research on beneficiation. The latter is probably not a legitimate expenditure under the provisions of the Exploration Program, and therefore should be deleted. The total cost of the project would then be approximately $205,000. A discussion with the engineer for the applicant indicates that any modification necessary to fit the project into the Exploration Program will be readily acceded to. Specific location of drill holes was not indicated on the accompanying map because the engineer did not feel that such spotting provided for sufficient flexibility. He is perfectly willing, however, to spot a part of the holes which could serve as the first phase of the project; spotting of the additional holes could then be deferred pending results of the first group. It is probable that several such sequences may be desirable.

It may be questionable whether additional drilling in areas of proved ore should be included under the guise "exploration", but this problem and that of drilling beneath proposed mill sites and waste piles should probably be left to the Production Expansion Division and to the Legal Division.

MDCrittenden:gt

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : George B. Holderer DATE: August 23, 1951

FROM : M. D. Crittenden, Jr.

SUBJECT: DMA-1829 X

Supplementing my memorandum of July 16, 1951. I have reviewed the modified proposal recently submitted by Utah Construction Company, and find that the major changes necessary have been made. The total amount of $250,000 now involved covers only the essential churn and diamond drilling and cost of sinking a shaft and crosscut for further sampling of the orebody. A revised map is included which indicates the location of 8 cross sections on which it is proposed to sink 40 drill holes. The location of 9 drill holes is shown approximately on the outer edge of the ore zone. The map is not accompanied by any additional discussion of the exploration plans except to say that the location of other holes will be determined by the results obtained in these.

Recommendation

It is recommended that the attached proposal be sent to Production Expansion Division in its present form inspite of the shortcomings mentioned concerning detailed plans of operation, and inspite of the ~~work~~ lack of detailed information on costs. It seems probable that both of these matters can be satisfactorily arranged by conferences between Production Expansion Division and the applicant. The Utah Construction Company has indicated its intent to let contracts for most, if not all, of the work involved, and it is probable that as soon as tentative approval of the project has been given and negotiations with the Production Expansion Division are underway, Those contracts can be completed and appended to the master contract. This should satisfy the need for detailed breakdown of expected costs.

Comment on drilling plans

The proposed 40 holes, evenly spaced across the drill sections indicated on the map, will cover the area of probable ore at about 500 ft. centers. It is believed that this will be sufficient to delineate the outline and determine the grade of the ore within the limits regarded as measured and indicated.

Mard Crittenden Jr.

George B. Holderer

August 23, 1951

M. D. Crittenden, Jr.

DMA91829 X

Supplementing my memorandum of July 16, 1951. I have reviewed the modified proposal recently submitted by Utah Construction Company, and find that the major changes necessary have been made. The total amount of $250,000 now involved covers only the essential churn and diamond drilling and cost of sinking a shaft and crosscut for further sampling of the orebody. A revised map is included which indicates the location of 8 cross sections on which it is proposed to sink 40 drill holes. The location of 9 drill holes is shown approximately on the outer edge of the ore zone. The map is not accompanied by any additional discussion of the exploration plans except to say that the location of other holes will be determined by the results obtained in these.

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Comment on drilling plans

The proposed 40 holes, evenly spaced across the drill sections indicated on the map, will cover the area of probable ore at about 500 ft. centers. It is believed that this will be sufficient to delineate the outline and determine the grade of the ore within the limits regarded as measured and indicated.

MDCrittenden:gt

FILE COPY
SURNAME:

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

Holderer
for
Schneider

AUG 21 1951

Hon. Fred Marshall
House of Representatives
Washington 25, D. C.

In reply please refer to
DMA 1829-X

My dear Mr. Marshall:

This is in reply to your letter of August 11, 1951, regarding the application for an exploration loan of the Nash Construction Company, DMA 1829-X.

The application was only filed a few days ago. It is a project of some size and involves a fairly large sum of money. Our engineers are working on it and will do their best to complete their task in the near future.

Sincerely yours,

C. C. Schneider
BJ
8/22

Acting Administrator

CBHolderer:dga
August 20, 1951

CC: Adm. Reading File
Reports & Records Unit
Dep. Admin., Rm 4617
Mr. Holderer
Files

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
WASHINGTON, D. C.
August 13, 1951

Mr. James Boyd, Director
Bureau of Mines
Interior Building
Washington 25, D. C.

Dear Mr. Boyd:

This is in reference to my letter of August 3, 1951, with regard to the proposal of the Utah Construction Company and associates which was submitted to the Defense Minerals Administration under DMA 1829 X.

You will recall we also discussed this in a telephone conversation but to date we have received no information as to the present status of this matter. Please advise me as soon as possible.

With thanks and kindest personal regards, I am

Sincerely yours,

/s/ Fred Marshall
/t/ Fred Marshall, M. C.

C O P Y

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

Hon. Fred Marshall
House of Representatives
Washington 25, D. C.

In reply please refer to
DMA 1829-X

My dear Mr. Marshall:

This is in reply to your letter of August 1[illegible], 1951, regarding the application for an exploration loan of the Utah Construction Company, DMA 1829-X.

The application was only filed a few days ago. It is a project of some size and involves a fairly large sum of money. Our engineers are working on it and will do their best to complete their task in the near future.

Sincerely yours,

G. B. SCHREDER

Acting Administrator

GBHolderer:dgs
August 20, 1951

CC: Adm. Reading File
Reports & Records Unit
Dep. Admin., Rm 4617
Mr. Holderer
Files

MF-500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE AUG 17 1951

REFERRED TO:

1. 340 3624
2.
3.
4.

AUG 17 1951
Rec'd by
Mr. Holden

FOR:

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

REMARKS: .....

Check (X) before the items needing attention.

ROBERT E. ADAMS REB
Initials of sender.

GPO 16—63815-1

FRED MARSHALL
SIXTH DISTRICT, MINN.

~~JAMES BOYD~~

340

Answered by Mr. Hoeferer 20 Aug 51

Congress of the United States
House of Representatives
Washington, D. C.

August 13, 1951

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 17 1951

Mr. James Boyd, Director
Bureau of Mines
Interior Building
Washington 25, D. C.

Dear Mr. Boyd:

This is in reference to my letter of August 3, 1951, with regard to the proposal of the Utah Construction Company and associates which was submitted to the Defense Minerals Administration under DMA 1829 X.

You will recall we also discussed this in a telephone conversation but to date we have received no information as to the present status of this matter. Please advise me as soon as possible.

With thanks and kindest personal regards, I am

Sincerely yours,

Fred Marshall

Fred Marshall, M.C.

FRED MARSHALL
SIXTH DISTRICT, MINN.

~~JAMES BOYD~~

H. Adams
Wash - Copy contact
(no attachment)

Congress of the United States
House of Representatives
Washington, D. C.

August 13, 1951

Mr. James Boyd, Director
Bureau of Mines
Interior Building
Washington 25, D. C.

AUG 17 1951
340 - Legislative Astg. Asst.

Dear Mr. Boyd:

This is in reference to my letter of August 3, 1951, with regard to the proposal of the Utah Construction Company and associates which was submitted to the Defense Minerals Administration under DMA 1829 X.

You will recall we also discussed this in a telephone conversation but to date we have received no information as to the present status of this matter. Please advise me as soon as possible.

With thanks and kindest personal regards, I am

Sincerely yours,

Fred Marshall, M.C.

AUG 21 PM 12

1951

Hon. Fred Marshall
House of Representatives
Washington 25, D. C.

In reply please refer to
DMA 1829-I

My dear Mr. Marshall:

This is in reply to your letter of August 1[illegible], 1951, regarding the application for an exploration loan of the Nash Construction Company, DMA 1829-I.

The application was only filed a few days ago. It is a project of some size and involves a fairly large sum of money. Our engineers are working on it and will do their best to complete their task in the near future.

Sincerely yours,

Wm. H. [illegible]

Acting Administrator

GBHolderer:dgs
August 20, 1951

CC: Adm. Reading File
Reports & Records Unit
Dep. Admin., Rm 4617
Mr. Holderer
Files

Hon. Fred Marshall
House of Representatives
Washington 25, D. C.

In reply please refer to
DSA 1829-1

My dear Mr. Marshall:

This is in reply to your letter of August 17, 1951, regarding the application for an exploration loan of the Utah Construction Company, DSA 1829-1.

The application was only filed a few days ago. It is a project of some size and involves a fairly large sum of money. Our engineers are working on it and will do their best to complete their task in the near future.

Sincerely yours,

Acting Administrator

GBHolderer:dgs
August 20, 1951

CC: Adm. Reading File
Reports & Records Unit
Dep. Admin., Rm 4617
Mr. Holderer
Files

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
WASHINGTON, D. C.
August 13, 1951

Mr. James Boyd, Director
Bureau of Mines
Interior Building
Washington 25, D. C.

Dear Mr. Boyd:

This is in reference to my letter of August 3, 1951, with regard to the proposal of the Utah Construction Company and associates which was submitted to the Defense Minerals Administration under DMA 1829 X.

You will recall we also discussed this in a telephone conversation but to date we have received no information as to the present status of this matter. Please advise me as soon as possible.

With thanks and kindest personal regards, I am

Sincerely yours,

/s/ Fred Marshall
/t/ Fred Marshall, M. C.

C O P Y

AUG 17 1951
Rec'd by Mr. Holderer

CHEMETALS CORPORATION

WILLIAM M. HAYDEN
PRESIDENT

August 16, 1951

Mr. George Holderer
Defense Minerals Administration
United States Bureau of Mines
Washington 25, D. C.

Dear Mr. Holderer:

As you suggested I am enclosing herewith a description of the process developed by the American Cyanamid Company through its subsidiary Chemical Construction Corporation for the treatment of low grade manganese ores, sometimes described as the "Chemico Technique."

This process is basically a simple log washing operation to concentrate the ore to approximately 20% manganese content and then by chemical beneficiation produce a manganese oxide sinter product of approximately 60% manganese content.

The ore is easily concentrated to 20% concentrate which is pumped as a slurry to a "Chemico Process" plant where it is first leached in agitated vessels with sulfur dioxide, thus converting the greater part of the manganese to sulfates, a small portion to thionates and some sulfites under certain conditions.

This slurry is passed to an autoclave where under high temperature and pressure it is oxidized by the use of oxygen to further convert the thionates, sulfites, and any other unreacted materials to sulfates. Under the conditions maintained during this operation, the greater portion of the aluminum, iron and magnesium are rejected as insoluble basic oxides. The slurry from this step is decanted. The solid materials from the oxidation are washed to remove any manganese bearing liquor and sent to the tailings.

The clear liquor with practically all of the manganese and relatively minor portions of the other materials present is fed to an evaporator where manganese sulfate crystals are formed. The manganese sulfate crystals are mixed with coal and a portion of recycled product and sintered. The product is an manganese oxide sinter, porous in structure, quite hard and durable.

The SO_2 gas produced in this operation is recycled back to the leach. The comparatively small amount of SO_2 required

488 MADISON AVENUE, NEW YORK 22, N. Y.

for makeup is produced by a sulfur burner and introduced to the leach with this recycled SO_2.

We estimate that the cost of a plant producing 100,000 long tons of manganese metal as 60% sinter (10,000,000 units of manganese per year) will be approximately $16,000,000 for the "Chemico Process" plant plus an estimated $1,000,000 for the concentrating plant. Estimated plant cost of the sinter through the Chemico Process is conservatively 50 to 60¢ per unit. It may be possible in actual plant operation to reduce this estimated figured by approximately 10%.

We quote "Battelle Memorial Institute" in its report on the Chemico Process.

"The Chemico Process appears to be technically and economically superior to any other process of which Battelle has knowledge for the production of a saleable manganese product from concentrates obtained from certain Cuyuna and Cuban ores. It is probably applicable to a wider variety of ores, although this feature was not studied by Battelle. Reagent costs are held to a minimum, and extraction efficiencies for manganese, when treating Cuyuna ore, are consistently around 95 per cent. The quality of product is excellent, with a manganese-to-iron ratio of about 19, low phosphorus, and low sulfur."

Sincerely yours,

William M. Hayden

William M. Hayden

FILE COPY
SURNAME:

Holderer
Mr. Orr
Schneider

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

AUG 13 1951

Hon. Fred Marshall
House of Representatives
Washington 25, D. C.

In reply please refer to
DMA 1827-X

My dear Mr. Marshall:

This is in reply to your letter of August 7, 1951, requesting information on the status of the application from the Utah Construction Company, DMA 1827-X.

This application was rewritten and was only submitted two days ago. There has not been time to give it full consideration.

Sincerely,

M. G. SCHNEIDER BJ 9-14

Acting Administrator

GEHolderer:dgs
August 13, 1951

CC: Adm. Reading File
Reports & Records Unit
Dep. Admin., Rm 4617
Mr. Holderer
Files

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
WASHINGTON, D. C.

August 3, 1951

Mr. James Boyd, Director
Bureau of Mines
Interior Building
Washington 25, D. C.

Dear Mr. Boyd:

I called your office recently to request assistance in expediting the processing of DMA 1829 X. Would you please inform me as to the present situation in this matter.

With thanks and kindest personal regards, I am

Sincerely yours,

/s/ Fred Marshall, M. C.

C O P Y

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

AUG 13 1951

Hon. Fred Marshall
House of Representatives
Washington 25, D. C.

In reply please refer to
DMA 1829-X

My dear Mr. Marshall:

This is in reply to your letter of August 7, 1951, requesting information on the status of the application from the Utah Construction Company, DMA 1829-X.

This application was rewritten and was only submitted two days ago. There has not been time to give it full consideration.

Sincerely,

[illegible]

Acting Administrator

GBHolderer:dgs
August 10, 1951

CC: Adm. Reading File
Reports & Records Unit
Dep. Admin., Rm 4617
Mr. Holderer
Files

FRED MARSHALL
SIXTH DISTRICT, MINN.

Congress of the United States
House of Representatives
Washington, D. C.

AUG 7 1951
Rec'd by
Mr. Hoeferer
answered
by Mr. Hoeferer
10 Aug 51

August 3, 1951

Mr. James Boyd, Director
Bureau of Mines
Interior Building
Washington 25, D. C.

Dear Mr. Boyd:

I called your office recently to request assistance in expediting the processing of DMA 1829 X. Would you please inform me as to the present situation in this matter.

With thanks and kindest personal regards, I am

Sincerely yours,

Fred Marshall

Fred Marshall, M.C.

Aug 13, 1951

AUG 1 8 1951

Hon. Fred Marshall
House of Representatives
Washington 25, D. C.

In reply please refer to
DMA 1829-X

My dear Mr. Marshall:

This is in reply to your letter of August 7, 1951, requesting information on the status of the application from the Utah Construction Company, DMA 1829-X.

This application was rewritten and was only submitted two days ago. There has not been time to give it full consideration.

Sincerely,

W. G. [illegible]

Acting Administrator

GBHolderer:dgs
August 13, 1951

CC: Adm. Reading File
Reports & Records Unit
Dep. Admin., Rm 4617
Mr. Holderer
Files

Aug 13, 1951

Hon. Fred Marshall
House of Representatives
Washington 25, D. C.

In reply please refer to
[illegible] 1827-[illegible]

My dear Mr. Marshall:

This is in reply to your letter of August 7, 1951, requesting information on the status of the application from the Utah Construction Company, [illegible] 1827-[illegible].

This application was rewritten and was only submitted two days ago. There has not been time to give it full consideration.

Sincerely,

Acting Administrator

GEHolderer:dgs
August 13, 1951

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CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
WASHINGTON, D. C.

August 3, 1951

Mr. James Boyd, Director
Bureau of Mines
Interior Building
Washington 25, D. C.

Dear Mr. Boyd:

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With thanks and kindest personal regards, I am

Sincerely yours,

/s/ Fred Marshall, M. C.

C O P Y

Form MF-103
(April 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.
Approval expires 6-30-51.

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

DO NOT FILL IN THIS BLOCK

Docket No. D.M.A. 1829X
Date received New figures submitted as of this date 8/7/51

Participation

The Utah Construction Company
and Associates
1 Montgomery Street
San Francisco, California

Name and address of applicant

Date August 3, 1951

FILL IN THIS BLOCK

Date of application July 11, 1951

Estimated cost $250,000

Mineral or metal Manganese

Percentage of Government participation 75%

Location of mine Aitkin County, Minnesota

Date of filing MF-100 July 11, 1951

DMA Docket Number, if available 1829X

INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four signed copies of the application to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive officer thereof, with your name and address on each sheet of the application and all accompanying papers. If any question is inapplicable, or if you cannot answer it, so state on the form. Where the space provided for answer is insufficient, answer on a separate sheet, annex it to the application form, and refer to it in space for answer. If the application is approved, you will be presented with an exploration project contract on Form MF-200, for your signature.

THE APPLICANT

*1. Is applicant an individual, partnership, or corporation?
*2. If a partnership, state names and addresses of partners.
*3. If a corporation, state names and addresses of officers, directors, and five largest stockholders.
*4. Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who will manage the project.
*5. Are you the owner or the lessee of the property?
6. If owner, state what claims, liens, or encumbrances, if any, are against the property.
7. If lessee, attach a copy of the lease and state if it is in good standing.

NOTE.—It will be necessary to procure and attach to the exploration project contract agreements of claimants, lienors, encumbrances and lessors subordinating their interests in the property to the interest of the Government under the contract.

8. Furnish current financial statement, showing assets and liabilities, and a profit and loss statement.
9. How much money is applicant prepared to invest in proposed project? Is it sufficient to pay your part of the cost of the project as detailed in question 23 of this application form, in accordance with the regulations on Government participation (Section 9 of Mineral Order 5)?

*If you have already answered these questions on MF-100, you are not required to answer the questions for this application.

16—64067-1

THE PROPERTY

10. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.
    (*b*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

    NOTE.—If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*b*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

*11. State the present and former names of the property, if any.

*12. State, in detail, the location of the property with reference to towns, railroads, roads, shipping points, including distances and directions and kinds and conditions of roads.

*13. State source and quantity of water available for operations and its sufficiency at all seasons.
State amount of power to be used, rate per hour or other cost, and source.

*14. Describe any existing useable facilities, equipment, buildings, or structure now on the property that will be devoted to the exploration work.

15. State in detail how the ore could be shipped and how and where milled.

*16. History:
    (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for any past suspensions of operations.
    (*b*) State briefly the known history and production of adjoining and neighboring properties.
    (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.

*17. Production:
    (*a*) If mine is in production, furnish the following information:

	Tons per day	*Grade or analysis*	*Cost per ton*	*Net value per ton*
(1) Mining				
(2) Milling				
(3) Shipped or sold				

*18. Ore or mineral reserves: (If property is or has been operating.)
    (*a*) Describe the ore or mineral deposits briefly.
    (*b*) Submit available maps and assay data.
    (*c*) Give estimated tonnage and grade of each class of ore reserves.

19. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

THE EXPLORATION

20. For what mineral or minerals and for what types of deposits and ores will the exploration be conducted?

21. Describe briefly, but concisely, the proposed work and the estimated time required to complete it.

    NOTE.—The Government will not participate in a project that will require more than 2 years to complete.

22. Furnish statement of the geological basis of the project with particular emphasis on factors leading the operator to expect the finding of commercial ore bodies. This statement should be accompanied by supporting maps such as geological maps, maps of the proposed openings and assay maps, sample lists, and other pertinent data.

THE REQUIREMENTS AND COSTS

23. Tabulate in the form of an itemized statement with a sum for each item the estimated requirements and costs of the project so that the total will give the estimated cost of the project in which the Government will participate, as follows:
    (*a*) Labor, by numbers and classes (miners, muckers, millmen, etc.), with wages of each.
    (*b*) Supervisors, by numbers and positions, with salaries of each.
    (*c*) Cost of necessary repairs to existing facilities, structures, and buildings.
    (*d*) Cost of necessary installation or construction of additional facilities, structures, and buildings.
    (*e*) Cost of items of equipment, not now owned by the applicant which must be purchased for operations at a cost of $50 or more each.
    (*f*) Cost of rental for equipment which the operator proposes to rent.
    (*g*) Rental value of items of equipment which the operator now owns and which will be devoted to the work.
    (*h*) Cost of materials and supplies, including items of equipment costing less than $50 each.
    (*i*) Cost of power, water, utilities, and any other items not provided for above.

24. Furnish a time schedule of the project, stated in terms of months after project is approved, showing progress expected to be accomplished and the money expected to be spent.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

The Utah Construction Co. and Associates
(Name of company)

By C. E. Erickson
(Signature of authorized official)

August 3, 1951
(Date)

Agent
(Title)

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.

*Same as footnote on page 1.

16—64067-1 U. S. GOVERNMENT PRINTING OFFICE

Form MF-103

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION.

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950.

June 27, 1951

1 to 5, inclusive, are answered in form MF-100, which is attached.

6. Applicant is lessee.

7. Lease is in good standing. A copy of the agreement is attached.

8. A financial statement is attached to form MF-100, which accompanies this application.

9. Applicant is prepared to invest $75,000 in the project. This sum exceeds our share of the cost as detailed in question 23, and according to the provisions of Section 9 of Mineral Order 5.

The Property

10. (a) The ore body lies in section 23, Township 48 N. range 27 west, Aitkin County, Minnesota.
    (b) Explorations are to be conducted over a considerable portion of the entire section. For the purposes of this contract the property will be subdivided into 40 acre tracts, and exploration is to proceed as discoveries indicate.

11 to 14, inclusive, are answered in form MF-100.

15. Mining will be done from an open pit, using power shovel loading and truck haulage. A gravity concentrating plant is to be erected on the property, and the 20% concentrate produced will be leached by a modified sulphur dioxide process, facilities for which will probably be erected on the property. The leaching process turns out a 62% manganese content sintered oxide, which is suitable for production of ferromanganese.

16 to 18, inclusive, are answered in form MF-100.

19. The foregoing answers are believed to cover the pertinent facts.

The Exploration

20. Explorations are to be conducted for manganese, indications of which have already been established by the drilling described previously. The deposit is believed to be a folded, bedded deposit, and is known to be of considerable thickness and extent. The ore contains manganese and iron as oxides, together with silica and alumina which constitute the gangue.

21. It is estimated that about 40 holes should be drilled to substantiate further the reserve of mineral, and to gain other information necessary to plan a mine. It is expected that this work can be completed within four months of commencement. In addition to the drill holes, it is felt that an exploratory shaft, or several large core holes, should be put down on the property to gain further knowledge of the character and formation of the mineral, and to obtain samples for further work on beneficiation. Tentative drilling sections and the shaft site are indicated in red on plan E-2, which is attached, but it is expected that early findings will dictate the final plan of development.

22. This property was originally drilled as a prospect for iron ore, owing to its position relative to the Cuyuna Range. Later exploration was made with the hope of developing a body of manganiferous iron ore. In the light of recent development of a process for leaching manganese, together with the susceptability of the ore to gravity concentration, the present program has been undertaken. Considerable ore is now known to exist, but the current exploration is necessary to plan the mine and to obtain samples for final metallurgical work.

The substantiation of this request lies in the drilling logs and metallurgical reports of work done on the ore. Photostatic copies of such reports as are available are attached to this application.

The Requirements and Costs

23. It is anticipated that drilling and shaft sinking will be done under contract by firms engaged in doing this type of work in the iron ranges. Estimates of costs are based on recent experience of the U.S.B.M. and the mining companies operating in the area.

24.

Type of Work	Completion Time (from date of approval)	Cost Estimate
Exploratory Drilling	4 mo.	
8,000 ft. churn drill holes @ $7.00/ft.		$ 56,000.00
4,000 ft. NX core drill hole @ $8.00/ft.		32,000.00
Exploratory Shaft (Using freezing method)	8 mo.	120,000.00
Exploration drifts	12 mo.	36,000.00
Access road		6,000.00
		$250,000.00

Form MF-100

U.S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

GENERAL TECHNICAL DATA
FOR USE UNDER THE
DEFENSE PRODUCTION ACT OF 1950.

June 27, 1951

1. (a) The property will produce manganese oxide ore, which will be gravity concentrated on the property. This concentrate will, in turn, be leached to provide a high grade, high purity product suitable for ferro-manganese production.

   (b) The ore is high in iron, and effort will be made to recover this as an iron ore.

2. The property is known only by its description, section 23, Township 48N, range 27W. Operations to date have consisted of sampling by churn - and diamond core - drilling, and metallurgical testing, as described below. The total amount of churn-drilling is 14,360 feet and the total amount of diamond core drilling is 2,583 feet.

3. (a) The property is about eight miles north of Aitkin, Minnesota. The town, which is the county seat, is served by the Northern Pacific Railroad.

   (b) The property is north-east of the Cuyuna Range iron mining district.

(c) (d) The ore body lies in section 23, township 48N, range 27W, Aitkin County, Minnesota.

4. (a) Applicant is engaged in an engineering program leading to the production of a 20% gravity concentrate from which a 62% sintered manganese oxide will be prepared by a modified sulphur dioxide leaching process. Continued explorations will furnish additional technical data to be utilized in completing plant designs.

   (b) Applicant is the lessee.

5. Production is not yet under way, but is expected to commence within twenty months.

6. Experience of the operators:

   The Utah Construction Company was organized in 1900, and since that time has engaged in heavy construction of all kinds, including hydroelectric power projects, railroads, industrial plants, tunnels, shafts, and military installations of all kinds including a complicated plant and installations for the Chemical Warfare Department.

6. Cont. For a long time the company has been associated with important mining companies in the performance of mining and stripping work for Kennecott Copper Corporation, Pittsburg Coal Company, and later the Pittsburg Consolidated Coal Company, Colorado Fuel and Iron Corporation, Columbia Iron Mining Company (Geneva Steel Company), and others.

Important achievements of the company have been the construction of plant facilities for Kennecott Copper Corporation which included smelting works, electrolytic refining plant, power house, and a concentration plant. The company successfully performed the general contract for construction of the major part of the Geneva Steel Plant for the Defense Plant Corporation. Other plant facilities built by the company are the design and construction of a zinc fuming plant for American Smelting and Refining Company, a chemical plant for Darco Corporation, a cobalt refinery for Howe Sound Company, and similar projects for other mining companies.

Continuous maintenance contracts are currently being performed for Geneva Steel Company and the Salt Lake Refinery.

Production of iron ore from our own iron mining property near Cedar City, Utah is 150,000 to 200,000 tons per month, and we are shipping ore to Kaiser Steel Company at Fontana, California, to Geneva Steel Company at Geneva and Ironton, Utah, to Carnegie Illinois Steel Company at Chicago and Pittsburg, to Inland Steel Company at Chicago, and to others.

In British Columbia we are opening a new open pit mine which will be processed through a magnetic separator plant with a capacity of 75,000 tons per month.

Associated with us are Foley Brothers, Inc. of St. Paul, Minn., a firm about seventy five years old with long experience in mining and construction work. Located in St. Paul, Minn., it has a wide knowledge and experience in Minnesota conditions and activities and on the iron range, and has performed construction work throughout the U. S., Canada and Alaska. During the past 27 years it has operated the world's largest open pit coal mine at Colstrip, Montana, currently producing about two million tons of coal annually, has acted as consultant and operator for the government of India in connection with open pit mines northwest of Calcutta and other similar projects.

7. (a) This property has been drilled, first for possible iron ore, and later for manganese ore, by three independent organizations. The first explorations were made by M. P. Botsford of Crosby, Minn. in 1913 and by the Crosby Exploration Company in 1917. Later, in 1947, the M.A. Hanna Coal and Ore Company put down a number of churn drill holes, and as recently as the fall of 1950, the U. S. Bureau of Mines made a series of diamond drill holes. The logs of all of these holes are available, and the split cores may be seen at Region V headquarters, U.S.B.M., Minneapolis, Minn.

7. (a) Cont. The manganiferous material on this property appears to be extensive, and has been shown to be susceptible to beneficiation by simple procedures.

(b) While this property may be considered contiguous to the Cuyuna Range iron formation, it is distinct and separate from the existing mines and is removed from the nearest mine by more than twenty miles.

(c) The private reports which have been made on this property are confidential and not immediately available. All of the reports, however, are substantiated in all respects by those of the U.S.B.M., Region V.

8. See financial statement attached for officers and directors. The five largest stockholders are:

Allen D. Christensen &
Carmen Christensen
1 Montgomery Street
San Francisco, California

Thomas D. Dee
Ogden, Utah

Eccles Hotel Company
Ogden, Utah

E. O. Wattis Estate
% Shepard Mitchell
815 No. Bedford Drive
Beverly Hills, California

P. L. & Phyllis Wattis
220 Bush Street
San Francisco, California

8. & 9. See financial statement of The Utah Construction Company.

10. Operations have not reached the production stage.

11. Proposed production is at the rate of 10,000 L. T. per 24 hrs. for 300 days per year. This will produce some 10,000,000 long ton units of manganese per year.

12. (a) The mineral body consists of bedded sedimentary deposits, considerably metamorphosed and lying in the form of an eroded anticline covered by alluviam some 150 feet thick. The mineral bed appears to vary from 150 to 250 feet in thickness. Assays have run from less than 1% to cover 20% Mn. Average minable material is believed to run 3 3/4% Mn. The mineral consists of grains of manganiferous material of varying sized embedded in fine, dense clayey material.

12. (b) Cont. U.S.B.M. drilling log of 5/13/50, Aitkin County, Minn. Sec. Ref. 1072 is referred to as substantiation, and a plan of the drilling is attached.

Mineral reserve	Estimated tons	% Mn.	Total Mn. content	Total recoverable long tons	Est.Cost of prod.
Measured	37,800,000	L.T. 3 3/4%	1,400,000	1,100,000	$6 / L.T. of 20% concentrate
Indicated	23,700,000	" "	880,000	710,000	"

13. It will be necessary to build about two miles of access road from a good county highway. A railroad spur about ten miles long is required. The entire area is perfectly flat, and the cost of these access facilities would be at the minimum for such works.

14. Blind Lake, about 500 acres in extent, is about half a mile due north of the northwest corner of the section, and could supply all the water needed for beneficiation. There would be no seasonal shortage.

15. Power is available from the Minnesota Power and Light Co's. grid, which is less than six miles distant. The rate for the estimated 2,500 kw required is under 1½¢/kw hr.

16. Varying numbers have been employed by previous interests to conduct drilling operations. None is employed at present.

17. There is no improvement on the property.

18. All conditions are believed to be described above.

Form MF-103
(April 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.
Approval expires 6-30-51.

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

DO NOT FILL IN THIS BLOCK

Docket No. D.M.A. 1829X
New figures submitted as of this date 8/7/51
Date received
Participation

The Utah Construction Company
and Associates
1 Montgomery Street
San Francisco, California

Name and address of applicant

Date August 3, 1951

FILL IN THIS BLOCK

Date of application July 11, 1951

Estimated cost $250,000

Mineral or metal Manganese

Percentage of Government participation 75%

Location of mine Aitkin County, Minnesota

Date of filing MF-100 July 11, 1951

DMA Docket Number, if available 1829X

INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four signed copies of the application to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive officer thereof, with your name and address on each sheet of the application and all accompanying papers. If any question is inapplicable, or if you cannot answer it, so state on the form. Where the space provided for answer is insufficient, answer on a separate sheet, annex it to the application form, and refer to it in space for answer. If the application is approved, you will be presented with an exploration project contract on Form MF-200, for your signature.

THE APPLICANT

*1. Is applicant an individual, partnership, or corporation?
*2. If a partnership, state names and addresses of partners.
*3. If a corporation, state names and addresses of officers, directors, and five largest stockholders.
*4. Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who will manage the project.
*5. Are you the owner or the lessee of the property?
6. If owner, state what claims, liens, or encumbrances, if any, are against the property.
7. If lessee, attach a copy of the lease and state if it is in good standing.

NOTE.—It will be necessary to procure and attach to the exploration project contract agreements of claimants, lienors, encumbrances and lessors subordinating their interests in the property to the interest of the Government under the contract.

8. Furnish current financial statement, showing assets and liabilities, and a profit and loss statement.
9. How much money is applicant prepared to invest in proposed project? Is it sufficient to pay your part of the cost of the project as detailed in question 23 of this application form, in accordance with the regulations on Government participation (Section 9 of Mineral Order 5)?

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16—64067-1

THE PROPERTY

10. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.
    (*b*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

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*14. Describe any existing useable facilities, equipment, buildings, or structure now on the property that will be devoted to the exploration work.

15. State in detail how the ore could be shipped and how and where milled.

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    (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for any past suspensions of operations.
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    (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.

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    (*a*) If mine is in production, furnish the following information:

	Tons per day	*Grade or analysis*	*Cost per ton*	*Net value per ton*
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(3) Shipped or sold				

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    (*a*) Describe the ore or mineral deposits briefly.
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22. Furnish statement of the geological basis of the project with particular emphasis on factors leading the operator to expect the finding of commercial ore bodies. This statement should be accompanied by supporting maps such as geological maps, maps of the proposed openings and assay maps, sample lists, and other pertinent data.

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24. Furnish a time schedule of the project, stated in terms of months after project is approved, showing progress expected to be accomplished and the money expected to be spent.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

The Utah Construction Co. and Associates
(Name of company)

By C H Beardsley
(Signature of authorized official)

August 3, 1951
(Date)

Agent
(Title)

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*Same as footnote on page 1.

16—64067-1 U. S. GOVERNMENT PRINTING OFFICE

Form MF-103

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION.

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950.

June 27, 1951

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9. Applicant is prepared to invest $75,000 in the project. This sum exceeds our share of the cost as detailed in question 23, and according to the provisions of Section 9 of Mineral Order 5.

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20. Explorations are to be conducted for manganese, indications of which have already been established by the drilling described previously. The deposit is believed to be a folded, bedded deposit, and is known to be of considerable thickness and extent. The ore contains manganese and iron as oxides, together with silica and alumina which constitute the gangue.

21. It is estimated that about 40 holes should be drilled to substantiate further the reserve of mineral, and to gain other information necessary to plan a mine. It is expected that this work can be completed within four months of commencement. In addition to the drill holes, it is felt that an exploratory shaft, or several large core holes, should be put down on the property to gain further knowledge of the character and formation of the mineral, and to obtain samples for further work on beneficiation. Tentative drilling sections and the shaft site are indicated in red on plan E-2, which is attached, but it is expected that early findings will dictate the final plan of development.

22. This property was originally drilled as a prospect for iron ore, owing to its position relative to the Cuyuna Range. Later exploration was made with the hope of developing a body of manganiferous iron ore. In the light of recent development of a process for leaching manganese, together with the susceptability of the ore to gravity concentration, the present progr has been undertaken. Considerable ore is now known to exist, but the current exploration is necessary to plan the mine and to obtain samples for final metallurgical work.

The substantiation of this request lies in the drilling logs and metallurgical reports of work done on the ore. Photostatic copies of such reports as are available are attached to this application.

The Requirements and Costs

23. It is anticipated that drilling and shaft sinking will be done under contract by firms engaged in doing this type of work in the iron ranges. Estimates of costs are based on recent experience of the U.S.B.M. and the mining companies operating in the area.

24.

Type of Work	Completion Time (from date of approval)	Cost Estimate
Exploratory Drilling	4 mo.	
8,000 ft. churn drill holes @ $7.00/ft.		$ 56,000.00
4,000 ft. NX core drill hole @ $8.00/ft.		32,000.00
Exploratory Shaft (Using freezing method)	8 mo.	120,000.00
Exploration drifts	12 mo.	36,000.00
Access road		6,000.00
		$250,000.00

Form MF-100

U.S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

GENERAL TECHNICAL DATA
FOR USE UNDER THE
DEFENSE PRODUCTION ACT OF 1950.

June 27, 1951

1. (a) The property will produce manganese oxide ore, which will be gravity concentrated on the property. This concentrate will, in turn, be leached to provide a high grade, high purity product suitable for ferro-manganese production.

   (b) The ore is high in iron, and effort will be made to recover this as an iron ore.

2. The property is known only by its description, section 23, Township 48N, range 27W. Operations to date have consisted of sampling by churn - and diamond core - drilling, and metallurgical testing, as described below. The total amount of churn-drilling is 14,360 feet and the total amount of diamond core drilling is 2,583 feet.

3. (a) The property is about eight miles north of Aitkin, Minnesota. The town, which is the county seat, is served by the Northern Pacific Railroad.

   (b) The property is north-east of the Cuyuna Range iron mining district.

   (c) (d) The ore body lies in section 23, township 48N, range 27W, Aitkin County, Minnesota.

4. (a) Applicant is engaged in an engineering program leading to the production of a 20% gravity concentrate from which a 62% sintered manganese oxide will be prepared by a modified sulphur dioxide leaching process. Continued explorations will furnish additional technical data to be utilized in completing plant designs.

   (b) Applicant is the lessee.

5. Production is not yet under way, but is expected to commence within twenty months.

6. Experience of the operators:

   The Utah Construction Company was organized in 1900, and since that time has engaged in heavy construction of all kinds, including hydroelectric power projects, railroads, industrial plants, tunnels, shafts, and military installations of all kinds including a complicated plant and installations for the Chemical Warfare Department.

6. Cont. For a long time the company has been associated with important mining companies in the performance of mining and stripping work for Kennecott Copper Corporation, Pittsburg Coal Company, and later the Pittsburg Consolidated Coal Company, Colorado Fuel and Iron Corporation, Columbia Iron Mining Company (Geneva Steel Company), and others.

Important achievements of the company have been the construction of plant facilities for Kennecott Copper Corporation which included smelting works, electrolytic refining plant, power house, and a concentration plant. The company successfully performed the general contract for construction of the major part of the Geneva Steel Plant for the Defense Plant Corporation. Other plant facilities built by the company are the design and construction of a zinc fuming plant for American Smelting and Refining Company, a chemical plant for Darco Corporation, a cobalt refinery for Howe Sound Company, and similar projects for other mining companies.

Continuous maintenance contracts are currently being performed for Geneva Steel Company and the Salt Lake Refinery.

Production of iron ore from our own iron mining property near Cedar City, Utah is 150,000 to 200,000 tons per month, and we are shipping ore to Kaiser Steel Company at Fontana, California, to Geneva Steel Company at Geneva and Ironton, Utah, to Carnegie Illinois Steel Company at Chicago and Pittsburg, to Inland Steel Company at Chicago, and to others.

In British Columbia we are opening a new open pit mine which will be processed through a magnetic separator plant with a capacity of 75,000 tons per month.

Associated with us are Foley Brothers, Inc. of St. Paul, Minn., a firm about seventy five years old with long experience in mining and construction work. Located in St. Paul, Minn., it has a wide knowledge and experience in Minnesota conditions and activities and on the iron range, and has performed construction work throughout the U. S., Canada and Alaska. During the past 27 years it has operated the world's largest open pit coal mine at Colstrip, Montana, currently producing about two million tons of coal annually, has acted as consultant and operator for the government of India in connection with open pit mines northwest of Calcutta and other similar projects.

7. (a) This property has been drilled, first for possible iron ore, and later for manganese ore, by three independent organizations. The first explorations were made by M. P. Botsford of Crosby, Minn. in 1913 and by the Crosby Exploration Company in 1917. Later, in 1947, the M.A. Hanna Coal and Ore Company put down a number of churn drill holes, and as recently as the fall of 1950, the U. S. Bureau of Mines made a series of diamond drill holes. The logs of all of these holes are available, and the split cores may be seen at Region V headquarters, U.S.B.M., Minneapolis, Minn.

7. (a) Cont. The manganiferous material on this property appears to be extensive, and has been shown to be susceptible to beneficiation by simple procedures.

(b) While this property may be considered contiguous to the Cuyuna Range iron formation, it is distinct and separate from the existing mines and is removed from the nearest mine by more than twenty miles.

(c) The private reports which have been made on this property are confidential and not immediately available. All of the reports, however, are substantiated in all respects by those of the U.S.B.M., Region V.

8. See financial statement attached for officers and directors. The five largest stockholders are:

Allen D. Christensen &
Carmen Christensen
1 Montgomery Street
San Francisco, California

Thomas D. Dee
Ogden, Utah

Eccles Hotel Company
Ogden, Utah

E. O. Wattis Estate
% Shepard Mitchell
815 No. Bedford Drive
Beverly Hills, California

P. L. & Phyllis Wattis
220 Bush Street
San Francisco, California

8. & 9. See financial statement of The Utah Construction Company.

10. Operations have not reached the production stage.

11. Proposed production is at the rate of 16,000 L. T. per 24 hrs. for 300 days per year. This will produce some 10,000,000 long ton units of manganese per year.

12. (a) The mineral body consists of bedded sedimentary deposits, considerably metamorphosed and lying in the form of an eroded anticline covered by alluviam some 150 feet thick. The mineral bed appears to vary from 150 to 250 feet in thickness. Assays have run from less than 1% to cover 20% Mn. Average minable material is believed to run 3 3/4% Mn. The mineral consists of grains of manganiferous material of varying sized embedded in fine, dense clayey material.

12. (b) Cont. U.S.B.M. drilling log of 5/13/50, Aitkin County, Minn. Sec. Ref. 1072 is referred to as substantiation, and a plan of the drilling is attached.

Mineral reserve	Estimated tons	% Mn.	Total Mn. content	Total recoverable long tons	Est.Cost of prod.
Measured	37,800,000	L.T. 3 3/4%	1,400,000	1,100,000	$6 / L.T. of 20% concentrate
Indicated	23,700,000	" "	880,000	710,000	"

13. It will be necessary to build about two miles of access road from a good county highway. A railroad spur about ten miles long is required. The entire area is perfectly flat, and the cost of these access facilities would be at the minimum for such works.

14. Blind Lake, about 500 acres in extent, is about half a mile due north of the northwest corner of the section, and could supply all the water needed for beneficiation. There would be no seasonal shortage.

15. Power is available from the Minnesota Power and Light Co's. grid, which is less than six miles distant. The rate for the estimated 2,500 kw required is under 1½¢/kw hr.

16. Varying numbers have been employed by previous interests to conduct drilling operations. None is employed at present.

17. There is no improvement on the property.

18. All conditions are believed to be described above.

Form MF-103
(April 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.
Approval expires 6-30-51.

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

DO NOT FILL IN THIS BLOCK

Docket No. D.M.A. 1829X
Date received New figures submitted as of this date 8/7/51

Participation

The Utah Construction Company
and Associates
1 Montgomery Street
San Francisco, California

Name and address of applicant

Date August 3, 1951

FILL IN THIS BLOCK

Date of application July 11, 1951

Estimated cost $250,000

Mineral or metal Manganese

Percentage of Government participation 75%

Location of mine Aitkin County, Minnesota

Date of filing MF-100 July 11, 1951

DMA Docket Number, if available 1829X

INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four signed copies of the application to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive officer thereof, with your name and address on each sheet of the application and all accompanying papers. If any question is inapplicable, or if you cannot answer it, so state on the form. Where the space provided for answer is insufficient, answer on a separate sheet, annex it to the application form, and refer to it in space for answer. If the application is approved, you will be presented with an exploration project contract on Form MF-200, for your signature.

THE APPLICANT

*1. Is applicant an individual, partnership, or corporation?
*2. If a partnership, state names and addresses of partners.
*3. If a corporation, state names and addresses of officers, directors, and five largest stockholders.
*4. Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who will manage the project.
*5. Are you the owner or the lessee of the property?
6. If owner, state what claims, liens, or encumbrances, if any, are against the property.
7. If lessee, attach a copy of the lease and state if it is in good standing.

NOTE.—It will be necessary to procure and attach to the exploration project contract agreements of claimants, lienors, encumbrances and lessors subordinating their interests in the property to the interest of the Government under the contract.

8. Furnish current financial statement, showing assets and liabilities, and a profit and loss statement.
9. How much money is applicant prepared to invest in proposed project? Is it sufficient to pay your part of the cost of the project as detailed in question 23 of this application form, in accordance with the regulations on Government participation (Section 9 of Mineral Order 5)?

*If you have already answered these questions on MF-100, you are not required to answer the questions for this application.

16—64067-1

THE PROPERTY

10. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.
    (*b*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

    NOTE.—If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*b*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

*11. State the present and former names of the property, if any.

*12. State, in detail, the location of the property with reference to towns, railroads, roads, shipping points, including distances and directions and kinds and conditions of roads.

*13. State source and quantity of water available for operations and its sufficiency at all seasons.
State amount of power to be used, rate per hour or other cost, and source.

*14. Describe any existing useable facilities, equipment, buildings, or structure now on the property that will be devoted to the exploration work.

15. State in detail how the ore could be shipped and how and where milled.

*16. History:
    (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for any past suspensions of operations.
    (*b*) State briefly the known history and production of adjoining and neighboring properties.
    (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.

*17. Production:
    (*a*) If mine is in production, furnish the following information:

	Tons per day	*Grade or analysis*	*Cost per ton*	*Net value per ton*
(1) Mining				
(2) Milling				
(3) Shipped or sold				

*18. Ore or mineral reserves: (If property is or has been operating.)
    (*a*) Describe the ore or mineral deposits briefly.
    (*b*) Submit available maps and assay data.
    (*c*) Give estimated tonnage and grade of each class of ore reserves.

19. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

THE EXPLORATION

20. For what mineral or minerals and for what types of deposits and ores will the exploration be conducted?

21. Describe briefly, but concisely, the proposed work and the estimated time required to complete it.

    NOTE.—The Government will not participate in a project that will require more than 2 years to complete.

22. Furnish statement of the geological basis of the project with particular emphasis on factors leading the operator to expect the finding of commercial ore bodies. This statement should be accompanied by supporting maps such as geological maps, maps of the proposed openings and assay maps, sample lists, and other pertinent data.

THE REQUIREMENTS AND COSTS

23. Tabulate in the form of an itemized statement with a sum for each item the estimated requirements and costs of the project so that the total will give the estimated cost of the project in which the Government will participate, as follows:
    (*a*) Labor, by numbers and classes (miners, muckers, millmen, etc.), with wages of each.
    (*b*) Supervisors, by numbers and positions, with salaries of each.
    (*c*) Cost of necessary repairs to existing facilities, structures, and buildings.
    (*d*) Cost of necessary installation or construction of additional facilities, structures, and buildings.
    (*e*) Cost of items of equipment, not now owned by the applicant which must be purchased for operations at a cost of $50 or more each.
    (*f*) Cost of rental for equipment which the operator proposes to rent.
    (*g*) Rental value of items of equipment which the operator now owns and which will be devoted to the work.
    (*h*) Cost of materials and supplies, including items of equipment costing less than $50 each.
    (*i*) Cost of power, water, utilities, and any other items not provided for above.

24. Furnish a time schedule of the project, stated in terms of months after project is approved, showing progress expected to be accomplished and the money expected to be spent.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

The Utah Construction Co. and Associates
(Name of company)

By C. H. Leach
(Signature of authorized official)

August 3, 1951
(Date)

Agent
(Title)

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.

*Same as footnote on page 1.

16—64067-1 U. S. GOVERNMENT PRINTING OFFICE

Form MF-103

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION.

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950.

June 27, 1951

1 to 5, inclusive, are answered in form MF-100, which is attached.

6. Applicant is lessee.

7. Lease is in good standing. A copy of the agreement is attached.

8. A financial statement is attached to form MF-100, which accompanies this application.

9. Applicant is prepared to invest $75,000 in the project. This sum exceeds our share of the cost as detailed in question 23, and according to the provisions of Section 9 of Mineral Order 5.

The Property

10. (a) The ore body lies in section 23, Township 48 N. range 27 west, Aitkin County, Minnesota.
(b) Explorations are to be conducted over a considerable portion of the entire section. For the purposes of this contract the property will be subdivided into 40 acre tracts, and exploration is to proceed as discoveries indicate.

11 to 14, inclusive, are answered in form MF-100.

15. Mining will be done from an open pit, using power shovel loading and truck haulage. A gravity concentrating plant is to be erected on the property, and the 20% concentrate produced will be leached by a modified sulphur dioxide process, facilities for which will probably be erected on the property. The leaching process turns out a 62% manganese content sintered oxide, which is suitable for production of ferromanganese.

16 to 18, inclusive, are answered in form MF-100.

19. The foregoing answers are believed to cover the pertinent facts.

The Exploration

20. Explorations are to be conducted for manganese, indications of which have already been established by the drilling described previously. The deposit is believed to be a folded, bedded deposit, and is known to be of considerable thickness and extent. The ore contains manganese and iron as oxides, together with silica and alumina which constitute the gangue.

21. It is estimated that about 40 holes should be drilled to substantiate further the reserve of mineral, and to gain other information necessary to plan a mine. It is expected that this work can be completed within four months of commencement. In addition to the drill holes, it is felt that an exploratory shaft, or several large core holes, should be put down on the property to gain further knowledge of the character and formation of the mineral, and to obtain samples for further work on beneficiation. Tentative drilling sections and the shaft site are indicated in red on plan E-2, which is attached, but it is expected that early findings will dictate the final plan of development.

22. This property was originally drilled as a prospect for iron ore, owing to its position relative to the Cuyuna Range. Later exploration was made with the hope of developing a body of manganiferous iron ore. In the light of recent development of a process for leaching manganese, together with the susceptability of the ore to gravity concentration, the present program has been undertaken. Considerable ore is now known to exist, but the current exploration is necessary to plan the mine and to obtain samples for final metallurgical work.

The substantiation of this request lies in the drilling logs and metallurgical reports of work done on the ore. Photostatic copies of such reports as are available are attached to this application.

The Requirements and Costs

23. It is anticipated that drilling and shaft sinking will be done under contract by firms engaged in doing this type of work in the iron ranges. Estimates of costs are based on recent experience of the U.S.B.M. and the mining companies operating in the area.

24.

Type of Work	Completion Time (from date of approval)	Cost Estimate
Exploratory Drilling	4 mo.	
8,000 ft. churn drill holes @ $7.00/ft.		$ 56,000.00
4,000 ft. NX core drill hole @ $8.00/ft.		32,000.00
Exploratory Shaft (Using freezing method)	8 mo.	120,000.00
Exploration drifts	12 mo.	36,000.00
Access road		6,000.00
		$250,000.00

MF-200
(June 1951)

Docket No. DMA _____

Commodity _____

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

EXPLORATION PROJECT CONTRACT [1]

It is agreed this _____ day of _____, 195 1, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, hereinafter called the "Government," and [2] The Utah Construction Company and Associates

hereinafter called the "Operator," as follows:

1. *Authority for contract.* This agreement is entered into under the authority of the Defense Production Act of 1950, pursuant to Mineral Order 5, entitled "Regulations Governing Government Aid in Defense Exploration Projects."

2. *Operator's property rights.* The exploration project shall be conducted on that certain property situated in the State of Minnesota, County of Aitkin, described as follows: [3] all of Section 23 T48N R27W

with respect to which the Operator represents and undertakes: [4]

~~(a) That he is the sole owner, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances as to each of which the subordination agreement of the holder is attached.~~

(b) That he is a lessee, in possession and entitled to possession, and the subordination agreement of the lessor is attached.

3. *Exploration project.* The Operator, within thirty days from the date of this contract shall commence work on a project of exploration for [5] manganese; shall prosecute the work efficiently, expertly, in a workmanlike manner, in accordance with good mining standards, with suitable and adequate equipment, materials, and labor, all properly designed to bring the project to completion within a period of [6] twelve months from the date of this contract. The exploration project and the work to be performed are more fully described on Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, is made a part of this contract.

4. *Performance of the work.* The work shall be performed by the Operator, under his sole direction and control: *Provided,* That with the consent of the Government and its written approval of the contract or contracts, all or any part of the work may be performed by the Operator through contract or contracts with independent contractors. The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

5. *Fixtures and improvements.* The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof. Any additional facilities, buildings, and fixtures, to be purchased, installed, or erected by the Operator, with the estimated cost of each, to which the Government will contribute currently its agreed pro rata share, are listed in Exhibit "A" attached hereto. The difference between the cost of such additional facilities, buildings, or fixtures, and the salvage value thereof at the conclusion of the work, shall be charged as a cost of the project to which the Government has contributed its pro rata share.

6. *Operating equipment.* Any operating equipment to be rented, purchased, or furnished by the Operator, with the allowable rental, purchase price, or depreciation, as the case may be, is listed under appropriate headings in Exhibit "A" attached hereto. As to equipment purchased for the project, the Government will contribute its agreed pro rata share of the cost thereof, and the difference between the cost and the salvage value at the conclusion of the work shall be charged as a cost of the project to which the Government has contributed its pro rata share.

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] State name, address, and nature of organization if any.
[3] Give legal description or enough to identify the property.
[4] Strike out the provision not applicable.
[5] Name of mineral.
[6] Not in excess of 2 years.

7. *Title to and disposition of property.* [illegible] facilities, buildings, fixtures, equipment, or [illegible]r items costing more than $50 each, paid for or purchased with funds contributed jointly by the Operator and the Government, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the termination of the contract, if they have any salvage value, shall be disposed of for their joint account unless the Government, in writing, waives its interest in any such items. The Government may require the dismantling, severance from land, and removal of any such items in order to realize its interest in the salvage value thereof, and the cost of any such removal and of the disposal of the items shall be for the joint account of the parties in proportion to their respective interests.

8. *Labor and supervision.* An itemized schedule of labor, by numbers and classes (miners, muckers, millmen, etc.), and of supervisors, by numbers and positions, with the maximum wages or salaries that may be paid to each as an allowable cost of the project is set forth in Exhibit "A" attached hereto.

9. *Rehabilitation and repairs.* A statement of the cost of any necessary rehabilitation or repairs to put existing facilities, buildings, installations, and fixtures into useful and operable condition and which are to be allowed as costs of the project is included in Exhibit "A."

10. *Allowable costs of the project.* The costs of the project in which the Government will participate are limited to the necessary, reasonable, direct costs of performing the exploration work, including the costs of materials, supplies, engineering, power, water, analytical work, accounting, and utilities, including items of equipment costing less than $50 each; and the costs referred to in Articles 5, 6, 8, and 9, and the exhibits annexed to and referred to in this contract. Although the Government may pay part of the cost of new or additional facilities, structures, buildings, and equipment, only the depreciation on such items, computed as indicated in Articles 5 and 6, will be charged as a cost of the project. No items of general overhead, corporate management, interest, taxes, or any other indirect costs not expressly allowed by these provisions, or work performed or costs incurred before the date of this contract, shall be allowed as costs of the project in which the Government will participate.

11. *Accounts and audits.* The Operator shall keep suitable records and accounts of operations, which the Government may inspect and audit at any time. The Government may at any time require an audit of the Operator's records and accounts by a certified public accountant, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract.

12. *Progress reports.* The Operator shall provide the Government with monthly reports of work performed under the contract upon forms to be provided by the Government. Each monthly progress report shall bear the certification of the Operator and shall constitute the Operator's invoice of costs incurred on the project during the period covered by the report.

13. *Payment to the Operator.* The monthly progress report (invoice), to the extent approved by the Government, shall be processed for payment by the Government. Payment shall be made in the amount of 75 percent of the approved costs incurred; *Provided,* That the aggregate total of all sums paid by the Government under this agreement shall not exceed $187,500.00 which is 75 percent of the agreed estimated total cost of this project, $250,000.00.

14. *Final reports by Operator.* Upon completion of the project or termination of this contract, the Operator shall provide the Government with a comprehensive geologic and engineering report, including an estimate of ore reserves, to the best of his ability. Four copies of all reports shall be furnished to the Government.

15. *Repayment by Operator.* If, upon the completion of the exploration project or termination of the contract, the Government considers that a discovery or development has resulted from the work from which commercial production of ore may be made, the Government, within 6 months thereafter, shall so certify to the Operator, particularly describing and delimiting its estimate of the discovery or the development. Thereafter, if and as ore is produced as a result of such discovery or development, the Operator and his successor in interest shall be and become obligated to pay to the Government a percentage royalty on the net smelter returns or other net proceeds realized from such ore, concentrates, or metal produced within ten (10) years from the date of this contract, until the total amount contributed by the Government, without interest, is fully repaid or said 10 years have elapsed, whichever occurs first, as follows:

Of net smelter returns or other net proceeds not in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent.

Of net smelter returns or other net proceeds in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent, plus one-half (½) percent for each additional full fifty cents ($0.50) in excess of eight dollars ($8.00) per ton of ore, but not in excess of a maximum of five (5) percent.

This obligation to repay from net returns or proceeds shall be and remain a claim and lien upon the mineral deposit which is the subject of the exploration project and upon any production resulting from such discovery or development, in favor of the Government, until fully paid, or until said 10-year period has elapsed; and this claim and lien and the Government's right to repayment shall survive any termination of the contract, whether by completion of the exploration project or otherwise. This article is not to be construed as imposing any obligation on the Operator or his successor in interest to produce ore from any such discovery or development.

16. *No assignment of contract.* Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder.

17. *Termination and completion.* The Government may, at any time, by written notice to the Operator, terminate this contract: (*a*) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contract; (*b*) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (*c*) if in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worthwhile discovery and in the opinion of the Government further operations are not justified. Upon the completion of the project or any termination of the contract the Operator shall render to the Government a full and final accounting of his operations under the contract and his expenditures of money; shall dispose of any unused materials, supplies, and equipment for the joint account of the Operator and the Government in the proportion of their respective interests; and shall pay to the Government its pro-rata share of any money remaining.

Executed in sextuplicate the day and year first above written.

The Utah Construction Company and Associates

(Operator)

By

THE UNITED STATES OF AMERICA

By

U. S. GOVERNMENT PRINTING OFFICE 16—64066-2

6 August 1951

EXPLORATION PROJECT CONTRACT

EXHIBIT "A"

It is proposed to utilize a supply of low grade manganiferous material occuring on Section 23-T48N R27W, in Aitkin County, Minnesota. The mineral apparently occurs in a syncline whose axis is approximately SW-NE. Churn and diamond core drilling indicate a probable ore body roughly rectangular, about 1000' wide, and from 5000' to 6000' long. The thickness of mineralization varies from 150' to 250', but the thicker portions contain leaner streaks, which brings the average more nearly to 150'. This indicates a probable tonnage of 62,000,000. With an average content of recoverable manganese of 3%, this shows the possibility of extracting some 190,000,000 long ton units of manganese.

Preliminary ore dressing work by three independent laboratories demonstrates that greater than 80% manganese recovery is possible when concentrating 4.5% ore to 20%. There should be no difficulty in achieving a similar result even with the grade of the ore falling to nearly 3%. This is due to the unusual characteristic of the formation, wherein the gangue exists chiefly as a very fine clayey material which may be washed away. Further refinement is then effected by gravity separation, such as sink-float.

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Approximately 40 holes are to be drilled to explore further the full extent of the ore body, and to determine its limits. Prevous drilling indicates the apparent axis of the ore body, and drawing E-2, which forms a part of Exhibit "A" shows a system of cross sections set up on 500 ft. centres. The first few holes are shown, to indicate where drilling will commence, but the majority of the holes will be planned from the findings of preceding holes.

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Previous drilling experience on the property has shown the feasibility of using both churn and diamond core drills for exploration, and the two estimates from well-established drilling contractors are considered very reliable.

The area in which this property is situated is known locally the "big swamp", and provision for handling wet ground by the freezing method is made in the estimated cost for shaft sinking. A survey of methods indicates this to be the most economical method, and the estimate attached agrees with estimates made by others.

A recapitulation of drilling and sinking costs is as follows:

Type of Work	Completion Time (from date of approval)	Cost
Exploratory drilling	4 mo.	
8,000 ft. churn drill hole @ $7.00/ft.		$ 56,000.00
4,000 ft. NX core drill hole @ $8.00/ft.		32,000.00
Exploration shaft (using freezing method)	8 mo.	120,000.00
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Access road		6,000.00
		$250,000.00

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY

MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

Shaft for Managnese Exploration

Conforming with your request of yesterday, I am sending herewith our estimates of the time and cost of sinking a shaft on the site you mentioned about 6 miles north of Aitkin, Minnesota.

We understand that the only purpose of sinking this shaft is to obtain a 1200 ton sample of bedrock at the site chosen, and that the shaft may be allowed to cave or fill after this sample is extracted. We assume that this sample might be logically taken from a shaft of 8 feet inside diameter, sunk 50 feet into bedrock, with one or more 8' x 10' drifts run from the shaft bottom for a total of about 100 feet.

We understand that the location is in or near a part of the "big swamp" and that ground is likely to be saturated from surface down; pumped water might have to be piped some distance to prevent return. We have assumed that work might be scheduled to avoid interference from floods.

In estimating, we have assumed that a good access road would be provided, but that the contractor would furnish all labor, supervision, equipment, material and supplies, including power, and pay all obligatory taxes and insurance, as well as his overhead and profit for the work, in cluding mobilization and cleanup.

We have considered three possible means of undertaking the work:

A. By dewatering from possibly four large churn drill holes with deep well pumps. There is an element of uncertainty in this that could be reduced by study of the overburden. Information gained in pumping might be of value in formulating mining plans and estimates.

B. By drop shaft. We consider this method subject to some undertainty until seal has been made to bedrock. As in "A", a further study of the overburden would help reduce the uncertainty.

August 2, 1951

Foley Brothers, Inc. — #2

C. By freezing the overburden and keeping it frozen till work in bedrock is complete. We regard this method as entirely applicable.

For work under these three methods, our estimates are as follows:

	A. Dewatering	B. Drop Shaft	C. Freezing
Cost through 150' Overburden	$176,000	$157,500	$120,000
Cost Sinking 50' and Drifting 100'	63,000	63,000	63,000
Total Cost	239,000	220,500	183,000
Total Time	6.5 months	5.5 months	6.0 months

The above estimates are based on present wages, prices and availability of men and equipment, on our general knowledge of the area concerned, and they were prepared on very short notice. E. J. Longyear Company reserves freedom of action in any future negotiations concerning this work.

While we are not familiar with all requirements of this work, we cannot help wondering if a sample of, say, 100 tons, taken from five or six 18" holes, might be satisfactory. We think that good core samples of bedrock might be taken by shot drill while overburden would be penetrated by churn drill. Samples could, of course, be taken at various points as desired, and the holes might later be used in initial dewatering prior to mining. We think the cost of this work might be in the order of $90,000.00.

I hope this information will be of use to you, and remain

Sincerely,

E. J. LONGYEAR COMPANY

R. L. Loofbourow, Manager,
Mine Contracting Department

RLL;es

c.c. D. M. Davidson

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY
MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

In accordance with our conversation of yesterday, we are pleased to submit below our estimate-proposal covering your contemplated exploratory drilling program which is to be carried out in Sections 23 and 27, 48-27, Aitkin County, Minnesota.

We understand that the work, as now planned, will consist of the drilling of a series of vertical holes, varying from 250' to 400' in depth, and comprising a total of 4,000' of diamond drilling, and 8,000' of Mesabi type churn drilling; that the sizes of the diamond drill holes required may be NX, BX, AX and EX.

For this work we propose to furnish two Longyear Gasoline Driven Diamond Core Drills, together with all the accessory equipment required to accomplish the work as now planned. We further propose to furnish all labor, power and materials and equipment as may be required for the complete performance of the work. We also propose to furnish competent drill crews so as to operate the drills on a single or double-shift basis, depending upon the availability of competent drill operators.

We will carry public liability insurance covering personal injury and property damage; Workmen's Compensation, Old Age Benefit, Unemployment and any other insurance on our employees required by state or federal laws; also, all-risk insurance on the drilling equipment protecting against loss by theft, fire, flood, land-slides and other similar hazards. Certificates showing the coverage referred to will be furnished if desired.

Based upon the conditions as outlined above, we quote as follows:

<u>Overburden drilling, Vertical holes</u>

0 to 100' in depth, measured from the collar of the hole	.....	$5.75 per ft.
100 to 200' " " ditto	.....	6.50 " "
200 to 300' " " ditto	.....	7.25 " "

<u>Diamond Core Drilling</u>

0 to 500' in depth, measured from the collar of the hole

EX size core,	7/8" in diameter	.....	6.50	per ft.
AX " "	1-1/8" " "	.....	7.00	" "
BX " "	1-5/8" " "	.....	7.50	" "
NX " "	2-1/8" " "	.....	8.00	" "

August 2, 1951

Foley Brothers Inc. — #2

Mesabi Churn Drilling (3" diameter hole)
0 to 500' in depth, measured from the collar of the hole ..... $6.00 per ft.

Advancing casing through ledge material when accomplished
either by blasting or reaming ..... 2.75 " "

Building access roads to drilling site when required ..... 6.50 per hour

Drill hole survey tests ..... 6.00 " "

Delays for your convenience or for which you are responsible ..... 6.00 " "

In addition to the foregoing, it is agreed that the following items will apply to the above quoted drilling rates only, it being understood that these charges are based upon the cost of supplying water to drill holes from the various sources of water supply.

Water supply allowance for drill holes where water is obtainable within
1500' of drill hole location .....15¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
1500', but not more than 3000 ft. from an adequate source
of water supply .....25¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
3000', but not more than 4500 ft. from an adequate source
of water supply ..... 40¢ per ft. drilled

Water supply allowance for drill holes which are in excess
of 4500'. ..... 55¢ per ft. drilled

Samples are to be turned over to your representative at the drill hole locations in receptacles furnished by you.

It is understood that the figures quoted above are based on conditions as of this date, and that they are desired as a basis for appropriation of funds. Because of uncertainty as to when the work might be undertaken, and conditions prevailing at that time, it is understood that this is not to be considered as a binding proposal. However, should it be decided to undertake the work, we should appreciate it if you would give us an opportunity, either to confirm the above proposal, or to make such adjustments as may be appropriate for the conditions at the time the work is undertaken.

Based on past experience on the Cuyuna Range, we would estimate that the average overall cost of the drilling would vary from $7.00 to $8.50 per foot. This, of course, would include cost of casing operations and water supply.

We appreciate the opportunity of discussing this work with you, and shall await with interest your further word.

Yours very truly,
E. J. LONGYEAR COMPANY

W. Davenport,
General Manager

WD;es

ATKINS-WALKER COMPANY
DIAMOND AND CHURN DRILL CONTRACTORS
ALWORTH BUILDING
DULUTH 2, MINN.

August 2, 1951

Mr. J. G. Poore, Manager
Foley Bros., Inc.
900 New York Building
St. Paul, Minnesota

Dear Mr. Poore-

We have outlined below a detailed estimate of the cost of 8000 feet of churn drilling and 4000 feet of core drilling in Sec. 23-48N-27W in Aitkin County, Minnesota.

We have drilled in this section for the Hanna Coal & Ore Corporation and also for the U. S. Bureau of Mines so I think you can definitely rely on our estimated cost of the proposed drilling. Our detailed estimate follows:

Churn drilling in Surface overburden - -	$ 6.00 per ft.
Churn drilling in Ledge, including casing - - - - - - - - - - - - - - - - -	7.50 " "
Diamond core drilling using an NX bit -	10.00 " "
Reaming for casing when necessary - - -	3.50 " "
Blasting down casing in Ledge - - - - -	2.50 " "
Cementing, when necessary - - - - - - -	65.00 per shift
Road building and snow removal - - - - -	At cost
Furnishing water to the drills in the winter season from a distance of more than 500 feet. Operation Steam pump station	25.00 per shift

Based on the above detailed drilling estimate of cost, the totals will approximate as follows:

8000 ft. of churn drilling - - - - - - - - - -	$ 56,000.00
4000 ft. of diamond drilling with NX bits -	40,000.00
NX casing holes in ledge necessary to secure accurate core and sludge samples, for a total of 4000 ft. - - - - - - - - - -	10,000.00
Estimated cost of road building, preparing drill locations and maintenance of pump station to furnish water to drills during the winter season - - - - - - - - - - - -	6,000.00

The above figures are exclusive of engineering, assaying, care and disposition of core and sludge samples, which, in the previous drilling, was handled by the Hanna Company and the U. S. Bureau of Mines.

The reason we have figured on the use of NX bits for diamond drilling is because the smaller sizes of bits, such as BX and AX, will not give adequate core recovery.

Trusting that the above figures will give you an indication of the total cost of the drilling program you have outlined, we are

Very truly yours,

ATKINS-WALKER COMPANY

By S. E. Atkins
President

SEA:MCB

MF-200
(June 1951)

Docket No. DMA _____

Commodity _____

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

EXPLORATION PROJECT CONTRACT [1]

It is agreed this _____ day of _____, 195 1, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, hereinafter called the "Government," and [2] The Utah Construction Company and Associates

hereinafter called the "Operator," as follows:

1. *Authority for contract.* This agreement is entered into under the authority of the Defense Production Act of 1950, pursuant to Mineral Order 5, entitled "Regulations Governing Government Aid in Defense Exploration Projects."

2. *Operator's property rights.* The exploration project shall be conducted on that certain property situated in the State of Minnesota, County of Aitkin, described as follows: [3] all of Section 23 T48N R27W

with respect to which the Operator represents and undertakes: [4]

~~(a) That he is the sole owner, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances as to each of which the subordination agreement of the holder is attached:~~

(*b*) That he is a lessee, in possession and entitled to possession, and the subordination agreement of the lessor is attached.

3. *Exploration project.* The Operator, within thirty days from the date of this contract shall commence work on a project of exploration for [5] manganese; shall prosecute the work efficiently, expertly, in a workmanlike manner, in accordance with good mining standards, with suitable and adequate equipment, materials, and labor, all properly designed to bring the project to completion within a period of [6] twelve months from the date of this contract. The exploration project and the work to be performed are more fully described on Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, is made a part of this contract.

4. *Performance of the work.* The work shall be performed by the Operator, under his sole direction and control: *Provided,* That with the consent of the Government and its written approval of the contract or contracts, all or any part of the work may be performed by the Operator through contract or contracts with independent contractors. The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

5. *Fixtures and improvements.* The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof. Any additional facilities, buildings, and fixtures, to be purchased, installed, or erected by the Operator, with the estimated cost of each, to which the Government will contribute currently its agreed pro rata share, are listed in Exhibit "A" attached hereto. The difference between the cost of such additional facilities, buildings, or fixtures, and the salvage value thereof at the conclusion of the work, shall be charged as a cost of the project to which the Government has contributed its pro rata share.

6. *Operating equipment.* Any operating equipment to be rented, purchased, or furnished by the Operator, with the allowable rental, purchase price, or depreciation, as the case may be, is listed under appropriate headings in Exhibit "A" attached hereto. As to equipment purchased for the project, the Government will contribute its agreed pro rata share of the cost thereof, and the difference between the cost and the salvage value at the conclusion of the work shall be charged as a cost of the project to which the Government has contributed its pro rata share.

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] State name, address, and nature of organization if any.
[3] Give legal description or enough to identify the property.
[4] Strike out the provision not applicable.
[5] Name of mineral.
[6] Not in excess of 2 years.

7. *Title to and disposition of property.* A[illegible]cilities, buildings, fixtures, equipment, or ot[illegible] items costing more than $50 each, paid for or purchased with funds contributed jointly by the Operator and the Government, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the termination of the contract, if they have any salvage value, shall be disposed of for their joint account unless the Government, in writing, waives its interest in any such items. The Government may require the dismantling, severance from land, and removal of any such items in order to realize its interest in the salvage value thereof, and the cost of any such removal and of the disposal of the items shall be for the joint account of the parties in proportion to their respective interests.

8. *Labor and supervision.* An itemized schedule of labor, by numbers and classes (miners, muckers, millmen, etc.), and of supervisors, by numbers and positions, with the maximum wages or salaries that may be paid to each as an allowable cost of the project is set forth in Exhibit "A" attached hereto.

9. *Rehabilitation and repairs.* A statement of the cost of any necessary rehabilitation or repairs to put existing facilities, buildings, installations, and fixtures into useful and operable condition and which are to be allowed as costs of the project is included in Exhibit "A."

10. *Allowable costs of the project.* The costs of the project in which the Government will participate are limited to the necessary, reasonable, direct costs of performing the exploration work, including the costs of materials, supplies, engineering, power, water, analytical work, accounting, and utilities, including items of equipment costing less than $50 each; and the costs referred to in Articles 5, 6, 8, and 9, and the exhibits annexed to and referred to in this contract. Although the Government may pay part of the cost of new or additional facilities, structures, buildings, and equipment, only the depreciation on such items, computed as indicated in Articles 5 and 6, will be charged as a cost of the project. No items of general overhead, corporate management, interest, taxes, or any other indirect costs not expressly allowed by these provisions, or work performed or costs incurred before the date of this contract, shall be allowed as costs of the project in which the Government will participate.

11. *Accounts and audits.* The Operator shall keep suitable records and accounts of operations, which the Government may inspect and audit at any time. The Government may at any time require an audit of the Operator's records and accounts by a certified public accountant, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract.

12. *Progress reports.* The Operator shall provide the Government with monthly reports of work performed under the contract upon forms to be provided by the Government. Each monthly progress report shall bear the certification of the Operator and shall constitute the Operator's invoice of costs incurred on the project during the period covered by the report.

13. *Payment to the Operator.* The monthly progress report (invoice), to the extent approved by the Government, shall be processed for payment by the Government. Payment shall be made in the amount of 75 percent of the approved costs incurred; *Provided,* That the aggregate total of all sums paid by the Government under this agreement shall not exceed $187,500.00 which is 75 percent of the agreed estimated total cost of this project, $250,000.00.

14. *Final reports by Operator.* Upon completion of the project or termination of this contract, the Operator shall provide the Government with a comprehensive geologic and engineering report, including an estimate of ore reserves, to the best of his ability. Four copies of all reports shall be furnished to the Government.

15. *Repayment by Operator.* If, upon the completion of the exploration project or termination of the contract, the Government considers that a discovery or development has resulted from the work from which commercial production of ore may be made, the Government, within 6 months thereafter, shall so certify to the Operator, particularly describing and delimiting its estimate of the discovery or the development. Thereafter, if and as ore is produced as a result of such discovery or development, the Operator and his successor in interest shall be and become obligated to pay to the Government a percentage royalty on the net smelter returns or other net proceeds realized from such ore, concentrates, or metal produced within ten (10) years from the date of this contract, until the total amount contributed by the Government, without interest, is fully repaid or said 10 years have elapsed, whichever occurs first, as follows:

Of net smelter returns or other net proceeds not in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent.

Of net smelter returns or other net proceeds in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent, plus one-half (½) percent for each additional full fifty cents ($0.50) in excess of eight dollars ($8.00) per ton of ore, but not in excess of a maximum of five (5) percent.

This obligation to repay from net returns or proceeds shall be and remain a claim and lien upon the mineral deposit which is the subject of the exploration project and upon any production resulting from such discovery or development, in favor of the Government, until fully paid, or until said 10-year period has elapsed; and this claim and lien and the Government's right to repayment shall survive any termination of the contract, whether by completion of the exploration project or otherwise. This article is not to be construed as imposing any obligation on the Operator or his successor in interest to produce ore from any such discovery or development.

16. *No assignment of contract.* Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder.

17. *Termination and completion.* The Government may, at any time, by written notice to the Operator, terminate this contract: (*a*) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contract; (*b*) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (*c*) if in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worthwhile discovery and in the opinion of the Government further operations are not justified. Upon the completion of the project or any termination of the contract the Operator shall render to the Government a full and final accounting of his operations under the contract and his expenditures of money; shall dispose of any unused materials, supplies, and equipment for the joint account of the Operator and the Government in the proportion of their respective interests; and shall pay to the Government its pro-rata share of any money remaining.

Executed in sextuplicate the day and year first above written.

The Utah Construction Company and Associates

(Operator)

By

THE UNITED STATES OF AMERICA

By

U. S. GOVERNMENT PRINTING OFFICE 16—64066-2

6 August 1951

EXPLORATION PROJECT CONTRACT

EXHIBIT "A"

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ATKINS-WALKER COMPANY
DIAMOND AND CHURN DRILL CONTRACTORS
ALWORTH BUILDING
DULUTH 2, MINN.

August 2, 1951

Mr. J. G. Poore, Manager
Foley Bros., Inc.
900 New York Building
St. Paul, Minnesota

Dear Mr. Poore-

We have outlined below a detailed estimate of the cost of 8000 feet of churn drilling and 4000 feet of core drilling in Sec. 23-48N-27W in Aitkin County, Minnesota.

We have drilled in this section for the Hanna Coal & Ore Corporation and also for the U. S. Bureau of Mines so I think you can definitely rely on our estimated cost of the proposed drilling. Our detailed estimate follows:

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Churn drilling in Ledge, including casing - - - - - - - - - - - - - - - - -	7.50 " "
Diamond core drilling using an NX bit -	10.00 " "
Reaming for casing when necessary - - -	3.50 " "
Blasting down casing in Ledge - - - - -	2.50 " "
Cementing, when necessary - - - - - - -	65.00 per shift
Road building and snow removal - - - - -	At cost
Furnishing water to the drills in the winter season from a distance of more than 500 feet. Operation Steam pump station	25.00 per shift

Based on the above detailed drilling estimate of cost, the totals will approximate as follows:

8000 ft. of churn drilling - - - - - - - - - -	$ 56,000.00
4000 ft. of diamond drilling with NX bits -	40,000.00
NX casing holes in ledge necessary to secure accurate core and sludge samples, for a total of 4000 ft.- - - - - - - - - - -	10,000.00
Estimated cost of road building, preparing drill locations and maintenance of pump station to furnish water to drills during the winter season - - - - - - - - - - - -	6,000.00

The above figures are exclusive of engineering, assaying, care and disposition of core and sludge samples, which, in the previous drilling, was handled by the Hanna Company and the U. S. Bureau of Mines.

The reason we have figured on the use of NX bits for diamond drilling is because the smaller sizes of bits, such as BX and AX, will not give adequate core recovery.

Trusting that the above figures will give you an indication of the total cost of the drilling program you have outlined, we are

Very truly yours,

ATKINS-WALKER COMPANY

By S. E. Atkins
President

SEA:MCB

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY

MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

Shaft for Managnese Exploration

Conforming with your request of yesterday, I am sending herewith our estimates of the time and cost of sinking a shaft on the site you mentioned about 6 miles north of Aitkin, Minnesota.

We understand that the only purpose of sinking this shaft is to obtain a 1200 ton sample of bedrock at the site chosen, and that the shaft may be allowed to cave or fill after this sample is extracted. We assume that this sample might be logically taken from a shaft of 8 feet inside diameter, sunk 50 feet into bedrock, with one or more 8' x 10' drifts run from the shaft bottom for a total of about 100 feet.

We understand that the location is in or near a part of the "big swamp" and that ground is likely to be saturated from surface down; pumped water might have to be piped some distance to prevent return. We have assumed that work might be scheduled to avoid interference from floods.

In estimating, we have assumed that a good access road would be provided, but that the contractor would furnish all labor, supervision, equipment, material and supplies, including power, and pay all obligatory taxes and insurance, as well as his overhead and profit for the work, in cluding mobilization and cleanup.

We have considered three possible means of undertaking the work:

A. By dewatering from possibly four large churn drill holes with deep well pumps. There is an element of uncertainty in this that could be reduced by study of the overburden. Information gained in pumping might be of value in formulating mining plans and estimates.

B. By drop shaft. We consider this method subject to some undertainty until seal has been made to bedrock. As in "A", a further study of the overburden would help reduce the uncertainty.

August 2, 1951

Foley Brothers, Inc. — #2

C. By freezing the overburden and keeping it frozen till work in bedrock is complete. We regard this method as entirely applicable.

For work under these three methods, our estimates are as follows:

	A. Dewatering	B. Drop Shaft	C. Freezing
Cost through 150' Overburden	$176,000	$157,500	$120,000
Cost Sinking 50' and Drifting 100'	63,000	63,000	63,000
Total Cost	239,000	220,500	183,000
Total Time	6.5 months	5.5 months	6.0 months

The above estimates are based on present wages, prices and availability of men and equipment, on our general knowledge of the area concerned, and they were prepared om very short notice. E. J. Longyear Company reserves freedom of action in any future negotiations concerning this work.

While we are not familiar with all requirements of this work, we cannot help wondering if a sample of, say, 100 tons, taken from five or six 10" holes, might be satisfactory. We think that good core samples of bedrock might be taken by shot drill while overburden would be penetrated by churn drill. Samples could, of course, be taken at various points as desired, and the holes might later be used in initial dewatering prior to mining. We think the cost of this work might be in the order of $90,000.00.

I hope this information will be of use to you, and remain

Sincerely,

E. J. LONGYEAR COMPANY

R. L. Loofbourow, Manager,
Mine Contracting Department

RLL;es

c.c. D. M. Davidson

DIAMOND DRILLING
SHAFT SINKING
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E. J. LONGYEAR COMPANY
MINING ENGINEERS
GENERAL OFFICE
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MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

In accordance with our conversation of yesterday, we are pleased to submit below our estimate-proposal covering your contemplated exploratory drilling program which is to be carried out in Sections 23 and 27, 48-27, Aitkin County, Minnesota.

We understand that the work, as now planned, will consist of the drilling of a series of vertical holes, varying from 250' to 400' in depth, and comprising a total of 4,000' of diamond drilling, and 8,000' of Mesabi type churn drilling; that the sizes of the diamond drill holes required may be NX, BX, AX and EX.

For this work we propose to furnish two Longyear Gasoline Driven Diamond Core Drills, together with all the accessory equipment required to accomplish the work as now planned. We further propose to furnish all labor, power and materials and equipment as may be required for the complete performance of the work. We also propose to furnish competent drill crews so as to operate the drills on a single or double-shift basis, depending upon the availability of competent drill operators.

We will carry public liability insurance covering personal injury and property damage; Workmen's Compensation, Old Age Benefit, Unemployment and any other insurance on our employees required by state or federal laws; also, all-risk insurance on the drilling equipment protecting against loss by theft, fire, flood, land-slides and other similar hazards. Certificates showing the coverage referred to will be furnished if desired.

Based upon the conditions as outlined above, we quote as follows:

<u>Overburden drilling, Vertical holes</u>

0 to 100' in depth, measured from the collar of the hole	.....	$5.75 per ft.
100 to 200' " " ditto	.....	6.50 " "
200 to 300' " " ditto	.....	7.25 " "

<u>Diamond Core Drilling</u>

0 to 500' in depth, measured from the collar of the hole

EX size core, 7/8" in diameter	.....	6.50 per ft.
AX " " 1-1/8" " "	.....	7.00 " "
BX " " 1-5/8" " "	.....	7.50 " "
NX " " 2-1/8" " "	.....	8.00 " "

August 2, 1951

Foley Brothers Inc. — #2

Mesabi Churn Drilling (3" diameter hole)
0 to 500' in depth, measured from the collar of the hole ..... $6.00 per ft.

Advancing casing through ledge material when accomplished
either by blasting or reaming ..... 2.75 " "

Building access roads to drilling site when required ..... 6.50 per hour

Drill hole survey tests ..... 6.00 " "

Delays for your convenience or for which you are responsible ..... 6.00 " "

In addition to the foregoing, it is agreed that the following items will apply to the above quoted drilling rates only, it being understood that these charges are based upon the cost of supplying water to drill holes from the various sources of water supply.

Water supply allowance for drill holes where water is obtainable within
1500' of drill hole location .....15¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
1500', but not more than 3000 ft. from an adequate source
of water supply .....25¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
3000', but not more than 4500 ft. from an adequate source
of water supply ..... 40¢ per ft. drilled

Water supply allowance for drill holes which are in excess
of 4500'. ..... 55¢ per ft. drilled

Samples are to be turned over to your representative at the drill hole locations in receptacles furnished by you.

It is understood that the figures quoted above are based on conditions as of this date, and that they are desired as a basis for appropriation of funds. Because of uncertainty as to when the work might be undertaken, and conditions prevailing at that time, it is understood that this is not to be considered as a binding proposal. However, should it be decided to undertake the work, we should appreciate it if you would give us an opportunity, either to confirm the above proposal, or to make such adjustments as may be appropriate for the conditions at the time the work is undertaken.

Based on past experience on the Cuyuna Range, we would estimate that the average overall cost of the drilling would vary from $7.00 to $8.50 per foot. This, of course, would include cost of casing operations and water supply.

We appreciate the opportunity of discussing this work with you, and shall await with interest your further word.

Yours very truly,
E. J. LONGYEAR COMPANY

W. Davenport,
General Manager

WD;es

MF-200
(June 1951)

Docket No. DMA _____

Commodity _____

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

EXPLORATION PROJECT CONTRACT [1]

It is agreed this _____ day of _____, 195 1, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, hereinafter called the "Government," and [2] The Utah Construction Company and Associates

hereinafter called the "Operator," as follows:

1. *Authority for contract.* This agreement is entered into under the authority of the Defense Production Act of 1950, pursuant to Mineral Order 5, entitled "Regulations Governing Government Aid in Defense Exploration Projects."

2. *Operator's property rights.* The exploration project shall be conducted on that certain property situated in the State of Minnesota, County of Aitkin described as follows: [3] all of Section 23 T48N R27W

with respect to which the Operator represents and undertakes: [4]

~~(a) That he is the sole owner, in possession and entitled to possession, and that the property is subject only to the following liens or encumbrances as to each of which the subordination agreement of the holder is attached:~~

(*b*) That he is a lessee, in possession and entitled to possession, and the subordination agreement of the lessor is attached.

3. *Exploration project.* The Operator, within thirty days from the date of this contract shall commence work on a project of exploration for [5] manganese; shall prosecute the work efficiently, expertly, in a workmanlike manner, in accordance with good mining standards, with suitable and adequate equipment, materials, and labor, all properly designed to bring the project to completion within a period of [6] twelve months from the date of this contract. The exploration project and the work to be performed are more fully described on Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, is made a part of this contract.

4. *Performance of the work.* The work shall be performed by the Operator, under his sole direction and control: *Provided,* That with the consent of the Government and its written approval of the contract or contracts, all or any part of the work may be performed by the Operator through contract or contracts with independent contractors. The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

5. *Fixtures and improvements.* The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof. Any additional facilities, buildings, and fixtures, to be purchased, installed, or erected by the Operator, with the estimated cost of each, to which the Government will contribute currently its agreed pro rata share, are listed in Exhibit "A" attached hereto. The difference between the cost of such additional facilities, buildings, or fixtures, and the salvage value thereof at the conclusion of the work, shall be charged as a cost of the project to which the Government has contributed its pro rata share.

6. *Operating equipment.* Any operating equipment to be rented, purchased, or furnished by the Operator, with the allowable rental, purchase price, or depreciation, as the case may be, is listed under appropriate headings in Exhibit "A" attached hereto. As to equipment purchased for the project, the Government will contribute its agreed pro rata share of the cost thereof, and the difference between the cost and the salvage value at the conclusion of the work shall be charged as a cost of the project to which the Government has contributed its pro rata share.

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] State name, address, and nature of organization if any.
[3] Give legal description or enough to identify the property.
[4] Strike out the provision not applicable.
[5] Name of mineral.
[6] Not in excess of 2 years.

7. *Title to and disposition of property.* [illegible] facilities, buildings, fixtures, equipment, or [illegible]er items costing more than $50 each, paid for or purchased with funds contributed jointly by the Operator and the Government, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the termination of the contract, if they have any salvage value, shall be disposed of for their joint account unless the Government, in writing, waives its interest in any such items. The Government may require the dismantling, severance from land, and removal of any such items in order to realize its interest in the salvage value thereof, and the cost of any such removal and of the disposal of the items shall be for the joint account of the parties in proportion to their respective interests.

8. *Labor and supervision.* An itemized schedule of labor, by numbers and classes (miners, muckers, millmen, etc.), and of supervisors, by numbers and positions, with the maximum wages or salaries that may be paid to each as an allowable cost of the project is set forth in Exhibit "A" attached hereto.

9. *Rehabilitation and repairs.* A statement of the cost of any necessary rehabilitation or repairs to put existing facilities, buildings, installations, and fixtures into useful and operable condition and which are to be allowed as costs of the project is included in Exhibit "A."

10. *Allowable costs of the project.* The costs of the project in which the Government will participate are limited to the necessary, reasonable, direct costs of performing the exploration work, including the costs of materials, supplies, engineering, power, water, analytical work, accounting, and utilities, including items of equipment costing less than $50 each; and the costs referred to in Articles 5, 6, 8, and 9, and the exhibits annexed to and referred to in this contract. Although the Government may pay part of the cost of new or additional facilities, structures, buildings, and equipment, only the depreciation on such items, computed as indicated in Articles 5 and 6, will be charged as a cost of the project. No items of general overhead, corporate management, interest, taxes, or any other indirect costs not expressly allowed by these provisions, or work performed or costs incurred before the date of this contract, shall be allowed as costs of the project in which the Government will participate.

11. *Accounts and audits.* The Operator shall keep suitable records and accounts of operations, which the Government may inspect and audit at any time. The Government may at any time require an audit of the Operator's records and accounts by a certified public accountant, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract.

12. *Progress reports.* The Operator shall provide the Government with monthly reports of work performed under the contract upon forms to be provided by the Government. Each monthly progress report shall bear the certification of the Operator and shall constitute the Operator's invoice of costs incurred on the project during the period covered by the report.

13. *Payment to the Operator.* The monthly progress report (invoice), to the extent approved by the Government, shall be processed for payment by the Government. Payment shall be made in the amount of 75 percent of the approved costs incurred; *Provided,* That the aggregate total of all sums paid by the Government under this agreement shall not exceed $187,500.00 which is 75 percent of the agreed estimated total cost of this project, $250,000.00.

14. *Final reports by Operator.* Upon completion of the project or termination of this contract, the Operator shall provide the Government with a comprehensive geologic and engineering report, including an estimate of ore reserves, to the best of his ability. Four copies of all reports shall be furnished to the Government.

15. *Repayment by Operator.* If, upon the completion of the exploration project or termination of the contract, the Government considers that a discovery or development has resulted from the work from which commercial production of ore may be made, the Government, within 6 months thereafter, shall so certify to the Operator, particularly describing and delimiting its estimate of the discovery or the development. Thereafter, if and as ore is produced as a result of such discovery or development, the Operator and his successor in interest shall be and become obligated to pay to the Government a percentage royalty on the net smelter returns or other net proceeds realized from such ore, concentrates, or metal produced within ten (10) years from the date of this contract, until the total amount contributed by the Government, without interest, is fully repaid or said 10 years have elapsed, whichever occurs first, as follows:

Of net smelter returns or other net proceeds not in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent.

Of net smelter returns or other net proceeds in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent, plus one-half (½) percent for each additional full fifty cents ($0.50) in excess of eight dollars ($8.00) per ton of ore, but not in excess of a maximum of five (5) percent.

This obligation to repay from net returns or proceeds shall be and remain a claim and lien upon the mineral deposit which is the subject of the exploration project and upon any production resulting from such discovery or development, in favor of the Government, until fully paid, or until said 10-year period has elapsed; and this claim and lien and the Government's right to repayment shall survive any termination of the contract, whether by completion of the exploration project or otherwise. This article is not to be construed as imposing any obligation on the Operator or his successor in interest to produce ore from any such discovery or development.

16. *No assignment of contract.* Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder.

17. *Termination and completion.* The Government may, at any time, by written notice to the Operator, terminate this contract: (*a*) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contract; (*b*) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (*c*) if in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worthwhile discovery and in the opinion of the Government further operations are not justified. Upon the completion of the project or any termination of the contract the Operator shall render to the Government a full and final accounting of his operations under the contract and his expenditures of money; shall dispose of any unused materials, supplies, and equipment for the joint account of the Operator and the Government in the proportion of their respective interests; and shall pay to the Government its pro-rata share of any money remaining.

Executed in sextuplicate the day and year first above written.

The Utah Construction Company
and Associates
(Operator)

By

THE UNITED STATES OF AMERICA

By

U. S. GOVERNMENT PRINTING OFFICE 16—64066-2

6 August 1951

EXPLORATION PROJECT CONTRACT

EXHIBIT "A"

It is proposed to utilize a supply of low grade manganiferous material occuring on Section 23-T48N R27W, in Aitkin County, Minnesota. The mineral apparently occurs in a syncline whose axis is approximately SW-NE. Churn and diamond core drilling indicate a probable ore body roughly rectangular, about 1000' wide, and from 5000' to 6000' long. The thickness of mineralization varies from 150' to 250', but the thicker portions contain leaner streaks, which brings the average more nearly to 150'. This indicates a probable tonnage of 62,000,000. With an average content of recoverable manganese of 3%, this shows the possibility of extracting some 190,000,000 long ton units of manganese.

Preliminary ore dressing work by three independent laboratories demonstrates that greater than 80% manganese recovery is possible when concentrating 4.5% ore to 20%. There should be no difficulty in achieving a similar result even with the grade of the ore falling to nearly 3%. This is due to the unusual characteristic of the formation, wherein the gangue exists chiefly as a very fine clayey material which may be washed away. Further refinement is then effected by gravity separation, such as sink-float.

The area is perfectly flat, and the overburden consists of sandy loam, clay, gravel and boulders to a depth of 150' over the entire ore body. Because of this thickness of overburden, open pit mining operations must be carried out on a large scale to be economical.

With a proposed leaching plant designed for a yearly production of 10,000,000 long ton units of manganese as a 61% manganese sinter, and assuming 350 working days per year in the leaching plant and 300 working days in the mine, ore production would be 11,000 long tons per 24 hours.

Owing to the depth of overburden, the only means of sampling the ore has been through some 40 churn-drill holes and 7 diamond core-drill holes. These show the undoubted existence of an enormous quantity of potential ore, but information on ore dressing and on the actual quality of ore which could be mined is needed.

In order to prove further the extent of the ore body it will be necessary to drill more holes. It is estimated that about 40 more holes should be drilled. Because equipment procurement entails a long delay, and because the large capital outlay magnifies the consequence of errors in calculations, it is considered desirable that run of mine samples, rather than drill cores or sludge, be obtained for ore dressing work. When it is mentioned that the ore dressing will probably entail the expenditure of about $1,000,000, and the leaching and sintering plant about $16,000,000, it can readily be seen that the sinking of an exploratory shaft for sample mining is amply justified.

The undertaking of these exploration measures and ore dressing research is felt to be highly desirable. It is estimated that a saving in plant cost of about 33% may be achieved by this work. The

The plan would call for a period of about one year for exploration, mining of samples, and information gathering for the most economical plant design.

EXPLORATION WORK

Approximately 40 holes are to be drilled to explore further the full extent of the ore body, and to determine its limits. Prevous drilling indicates the apparent axis of the ore body, and drawing E-2, which forms a part of Exhibit "A" shows a system of cross sections set up on 500 ft. centres. The first few holes are shown, to indicate where drilling will commence, but the majority of the holes will be planned from the findings of preceding holes.

The drilling is to be divided between Mesabi type churn drilling, where unusual precautions are used to secure representative samples, and diamond core drilling for structural correlation. The core drilling will constitute one-third of the total footage.

The ore material differs from any now mined in composition and general character, and while cores have been obtained, and more are to be produced, more exact knowledge than can be had from cores is essential to evaluate fully the recovery obtainable and the general feasibility of handling. To state this in another way, the mineral is not sufficiently comparable to anything now being handled in milling practice, and larger amounts must be examined and tested to evaluate the mineral as an ore. To do this, a temporary shaft of minimum dimensions is to be sunk through 150 ft. of overburden and into the mineral body about fifty feet. From the foot of the shaft a small drift is to be driven in both directions at right angles to the apparent axis of the formation. The drifting will permit close examination of the rock in place, and the spoil will afford ample material for thorough testing and examination.

Previous drilling experience on the property has shown the feasibility of using both churn and diamond core drills for exploration, and the two estimates from well-established drilling contractors are considered very reliable.

The area in which this property is situated is known locally the "big swamp", and provision for handling wet ground by the freezing method is made in the estimated cost for shaft sinking. A survey of methods indicates this to be the most economical method, and the estimate attached agrees with estimates made by others.

A recapitulation of drilling and sinking costs is as follows:

Type of Work	Completion Time (from date of approval)	Cost
Exploratory drilling	4 mo.	
8,000 ft. churn drill hole @ $7.00/ft.		$ 56,000.00
4,000 ft. NX core drill hole @ $8.00/ft.		32,000.00
Exploration shaft (using freezing method)	8 mo.	120,000.00
Exploration drifts	12 mo.	36,000.00
Access road		6,000.00
		$250,000.00

ATKINS-WALKER COMPANY

DIAMOND AND CHURN DRILL CONTRACTORS

ALWORTH BUILDING
DULUTH 2, MINN.

August 2, 1951

Mr. J. G. Poore, Manager
Foley Bros., Inc.
900 New York Building
St. Paul, Minnesota

Dear Mr. Poore-

We have outlined below a detailed estimate of the cost of 8000 feet of churn drilling and 4000 feet of core drilling in Sec. 23-48N-27W in Aitkin County, Minnesota.

We have drilled in this section for the Hanna Coal & Ore Corporation and also for the U. S. Bureau of Mines so I think you can definitely rely on our estimated cost of the proposed drilling. Our detailed estimate follows:

Churn drilling in Surface overburden - -	$ 6.00 per ft.
Churn drilling in Ledge, including casing - - - - - - - - - - - - - - - - -	7.50 " "
Diamond core drilling using an NX bit -	10.00 " "
Reaming for casing when necessary - - -	3.50 " "
Blasting down casing in Ledge - - - - -	2.50 " "
Cementing, when necessary - - - - - - -	65.00 per shift
Road building and snow removal - - - - -	At cost
Furnishing water to the drills in the winter season from a distance of more than 500 feet. Operation Steam pump station	25.00 per shift

Based on the above detailed drilling estimate of cost, the totals will approximate as follows:

8000 ft. of churn drilling - - - - - - - - - -	$ 56,000.00
4000 ft. of diamond drilling with NX bits -	40,000.00
NX casing holes in ledge necessary to secure accurate core and sludge samples, for a total of 4000 ft.- - - - - - - - - - -	10,000.00
Estimated cost of road building, preparing drill locations and maintenance of pump station to furnish water to drills during the winter season - - - - - - - - - - - - -	6,000.00

The above figures are exclusive of engineering, assaying, care and disposition of core and sludge samples, which, in the previous drilling, was handled by the Hanna Company and the U. S. Bureau of Mines.

The reason we have figured on the use of NX bits for diamond drilling is because the smaller sizes of bits, such as BX and AX, will not give adequate core recovery.

Trusting that the above figures will give you an indication of the total cost of the drilling program you have outlined, we are

Very truly yours,

ATKINS-WALKER COMPANY

By S. E. Atkins
President

SEA:MCB

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY
MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

Shaft for Managnese Exploration

Conforming with your request of yesterday, I am sending herewith our estimates of the time and cost of sinking a shaft on the site you mentioned about 6 miles north of Aitkin, Minnesota.

We understand that the only purpose of sinking this shaft is to obtain a 1200 ton sample of bedrock at the site chosen, and that the shaft may be allowed to cave or fill after this sample is extracted. We assume that this sample might be logically taken from a shaft of 8 feet inside diameter, sunk 50 feet into bedrock, with one or more 8' x 10' drifts run from the shaft bottom for a total of about 100 feet.

We understand that the location is in or near a part of the "big swamp" and that ground is likely to be saturated from surface down; pumped water might have to be piped some distance to prevent return. We have assumed that work might be scheduled to avoid interference from floods.

In estimating, we have assumed that a good access road would be provided, but that the contractor would furnish all labor, supervision, equipment, material and supplies, including power, and pay all obligatory taxes and insurance, as well as his overhead and profit for the work, in cluding mobilization and cleanup.

We have considered three possible means of undertaking the work:

A. By dewatering from possibly four large churn drill holes with deep well pumps. There is an element of uncertainty in this that could be reduced by study of the overburden. Information gained in pumping might be of value in formulating mining plans and estimates.

B. By drop shaft. We consider this method subject to some undertainty until seal has been made to bedrock. As in "A", a further study of the overburden would help reduce the uncertainty.

August 2, 1951

Foley Brothers, Inc. — #2

C. By freezing the overburden and keeping it frozen till work in bedrock is complete. We regard this method as entirely applicable.

For work under these three methods, our estimates are as follows:

	A. Dewatering	B. Drop Shaft	C. Freezing
Cost through 150' Overburden	$176,000	$157,500	$120,000
Cost Sinking 50' and Drifting 100'	63,000	63,000	63,000
Total Cost	239,000	220,500	183,000
Total Time	6.5 months	5.5 months	6.0 months

The above estimates are based on present wages, prices and availability of men and equipment, on our general knowledge of the area concerned, and they were prepared om very short notice. E. J. Longyear Company reserves freedom of action in any future negotiations concerning this work.

While we are not familiar with all requirements of this work, we cannot help wondering if a sample of, say, 100 tons, taken from five or six 18" holes, might be satisfactory. We think that good core samples of bedrock might be taken by shot drill while overburden would be penetrated by churn drill. Samples could, of course, be taken at various points as desired, and the holes might later be used in initial dewatering prior to mining. We think the cost of this work might be in the order of $90,000.00.

I hope this information will be of use to you, and remain

Sincerely,

E. J. LONGYEAR COMPANY

R. L. Loofbourow, Manager,
Mine Contracting Department

RLL;es

c.c. D. M. Davidson

DIAMOND DRILLING
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E. J. LONGYEAR COMPANY
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MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

In accordance with our conversation of yesterday, we are pleased to submit below our estimate-proposal covering your contemplated exploratory drilling program which is to be carried out in Sections 23 and 27, 48-27, Aitkin County, Minnesota.

We understand that the work, as now planned, will consist of the drilling of a series of vertical holes, varying from 250' to 400' in depth, and comprising a total of 4,000' of diamond drilling, and 8,000' of Mesabi type churn drilling; that the sizes of the diamond drill holes required may be NX, BX, AX and EX.

For this work we propose to furnish two Longyear Gasoline Driven Diamond Core Drills, together with all the accessory equipment required to accomplish the work as now planned. We further propose to furnish all labor, power and materials and equipment as may be required for the complete performance of the work. We also propose to furnish competent drill crews so as to operate the drills on a single or double-shift basis, depending upon the availability of competent drill operators.

We will carry public liability insurance covering personal injury and property damage; Workmen's Compensation, Old Age Benefit, Unemployment and any other insurance on our employees required by state or federal laws; also, all-risk insurance on the drilling equipment protecting against loss by theft, fire, flood, land-slides and other similar hazards. Certificates showing the coverage referred to will be furnished if desired.

Based upon the conditions as outlined above, we quote as follows:

<u>Overburden drilling, Vertical holes</u>

0 to 100' in depth, measured from the collar of the hole	.....	$5.75 per ft.
100 to 200' " " ditto	.....	6.50 " "
200 to 300' " " ditto	.....	7.25 " "

<u>Diamond Core Drilling</u>

0 to 500' in depth, measured from the collar of the hole

EX size core, 7/8" in diameter	.....	6.50 per ft.
AX " " 1-1/8" " "	.....	7.00 " "
BX " " 1-5/8" " "	.....	7.50 " "
NX " " 2-1/8" " "	.....	8.00 " "

August 2, 1951

Foley Brothers Inc. — #2

Mesabi Churn Drilling (3" diameter hole)
0 to 500' in depth, measured from the collar of the hole ..... $6.00 per ft.

Advancing casing through ledge material when accomplished
either by blasting or reaming ..... 2.75 " "

Building access roads to drilling site when required ..... 6.50 per hour

Drill hole survey tests ..... 6.00 " "

Delays for your convenience or for which you are responsible ..... 6.00 " "

In addition to the foregoing, it is agreed that the following items will apply to the above quoted drilling rates only, it being understood that these charges are based upon the cost of supplying water to drill holes from the various sources of water supply.

Water supply allowance for drill holes where water is obtainable within
1500' of drill hole location .....15¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
1500', but not more than 3000 ft. from an adequate source
of water supply .....25¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
3000', but not more than 4500 ft. from an adequate source
of water supply ..... 40¢ per ft. drilled

Water supply allowance for drill holes which are in excess
of 4500'. ..... 55¢ per ft. drilled

Samples are to be turned over to your representative at the drill hole locations in receptacles furnished by you.

It is understood that the figures quoted above are based on conditions as of this date, and that they are desired as a basis for appropriation of funds. Because of uncertainty as to when the work might be undertaken, and conditions prevailing at that time, it is understood that this is not to be considered as a binding proposal. However, should it be decided to undertake the work, we should appreciate it if you would give us an opportunity, either to confirm the above proposal, or to make such adjustments as may be appropriate for the conditions at the time the work is undertaken.

Based on past experience on the Cuyuna Range, we would estimate that the average overall cost of the drilling would vary from $7.00 to $8.50 per foot. This, of course, would include cost of casing operations and water supply.

We appreciate the opportunity of discussing this work with you, and shall await with interest your further word.

Yours very truly,
E. J. LONGYEAR COMPANY

W. Davenport,
General Manager

WD;es

MF-200
(June 1951)

Docket No. DMA _____
Commodity _____

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

EXPLORATION PROJECT CONTRACT [1]

It is agreed this _____ day of _____, 195 1, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, hereinafter called the "Government," and [2] The Utah Construction Company and Associates

hereinafter called the "Operator," as follows:

1. *Authority for contract.* This agreement is entered into under the authority of the Defense Production Act of 1950, pursuant to Mineral Order 5, entitled "Regulations Governing Government Aid in Defense Exploration Projects."

2. *Operator's property rights.* The exploration project shall be conducted on that certain property situated in the State of Minnesota County of Aitkin described as follows: [3] All of Section 23 T48N R27W

with respect to which the Operator represents and undertakes: [4]

(*a*) That he is the sole owner, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances as to each of which the subordination agreement of the holder is attached: _____

(*b*) That he is a lessee, in possession and entitled to possession, and the subordination agreement of the lessor is attached.

3. *Exploration project.* The Operator within thirty days from the date of this contract shall commence work on a project of exploration for [5] manganese; shall prosecute the work efficiently, expertly, in a workmanlike manner, in accordance with good mining standards, with suitable and adequate equipment, materials, and labor, all properly designed to bring the project to completion within a period of [6] twelve months from the date of this contract. The exploration project and the work to be performed are more fully described on Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, is made a part of this contract.

4. *Performance of the work.* The work shall be performed by the Operator, under his sole direction and control: *Provided,* That with the consent of the Government and its written approval of the contract or contracts, all or any part of the work may be performed by the Operator through contract or contracts with independent contractors. The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

5. *Fixtures and improvements.* The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof. Any additional facilities, buildings, and fixtures, to be purchased, installed, or erected by the Operator, with the estimated cost of each, to which the Government will contribute currently its agreed pro rata share, are listed in Exhibit "A" attached hereto. The difference between the cost of such additional facilities, buildings, or fixtures, and the salvage value thereof at the conclusion of the work, shall be charged as a cost of the project to which the Government has contributed its pro rata share.

6. *Operating equipment.* Any operating equipment to be rented, purchased, or furnished by the Operator, with the allowable rental, purchase price, or depreciation, as the case may be, is listed under appropriate headings in Exhibit "A" attached hereto. As to equipment purchased for the project, the Government will contribute its agreed pro rata share of the cost thereof, and the difference between the cost and the salvage value at the conclusion of the work shall be charged as a cost of the project to which the Government has contributed its pro rata share.

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] State name, address, and nature of organization if any.
[3] Give legal description or enough to identify the property.
[4] Strike out the provision not applicable.
[5] Name of mineral.
[6] Not in excess of 2 years.

7. *Title to and disposition of property.* All facilities, buildings, fixtures, equipment, and other items costing more than $50 each, paid for or purchased with funds contributed jointly by the Operator and the Government, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the termination of the contract, if they have any salvage value, shall be disposed of for their joint account unless the Government, in writing, waives its interest in any such items. The Government may require the dismantling, severance from land, and removal of any such items in order to realize its interest in the salvage value thereof, and the cost of any such removal and of the disposal of the items shall be for the joint account of the parties in proportion to their respective interests.

8. *Labor and supervision.* An itemized schedule of labor, by numbers and classes (miners, muckers, millmen, etc.), and of supervisors, by numbers and positions, with the maximum wages or salaries that may be paid to each as an allowable cost of the project is set forth in Exhibit "A" attached hereto.

9. *Rehabilitation and repairs.* A statement of the cost of any necessary rehabilitation or repairs to put existing facilities, buildings, installations, and fixtures into useful and operable condition and which are to be allowed as costs of the project is included in Exhibit "A."

10. *Allowable costs of the project.* The costs of the project in which the Government will participate are limited to the necessary, reasonable, direct costs of performing the exploration work, including the costs of materials, supplies, engineering, power, water, analytical work, accounting, and utilities, including items of equipment costing less than $50 each; and the costs referred to in Articles 5, 6, 8, and 9, and the exhibits annexed to and referred to in this contract. Although the Government may pay part of the cost of new or additional facilities, structures, buildings, and equipment, only the depreciation on such items, computed as indicated in Articles 5 and 6, will be charged as a cost of the project. No items of general overhead, corporate management, interest, taxes, or any other indirect costs not expressly allowed by these provisions, or work performed or costs incurred before the date of this contract, shall be allowed as costs of the project in which the Government will participate.

11. *Accounts and audits.* The Operator shall keep suitable records and accounts of operations, which the Government may inspect and audit at any time. The Government may at any time require an audit of the Operator's records and accounts by a certified public accountant, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract.

12. *Progress reports.* The Operator shall provide the Government with monthly reports of work performed under the contract upon forms to be provided by the Government. Each monthly progress report shall bear the certification of the Operator and shall constitute the Operator's invoice of costs incurred on the project during the period covered by the report.

13. *Payment to the Operator.* The monthly progress report (invoice), to the extent approved by the Government, shall be processed for payment by the Government. Payment shall be made in the amount of 75 percent of the approved costs incurred; *Provided,* That the aggregate total of all sums paid by the Government under this agreement shall not exceed $187,500.00, which is 75 percent of the agreed estimated total cost of this project, $250,000.00.

14. *Final reports by Operator.* Upon completion of the project or termination of this contract, the Operator shall provide the Government with a comprehensive geologic and engineering report, including an estimate of ore reserves, to the best of his ability. Four copies of all reports shall be furnished to the Government.

15. *Repayment by Operator.* If, upon the completion of the exploration project or termination of the contract, the Government considers that a discovery or development has resulted from the work from which commercial production of ore may be made, the Government, within 6 months thereafter, shall so certify to the Operator, particularly describing and delimiting its estimate of the discovery or the development. Thereafter, if and as ore is produced as a result of such discovery or development, the Operator and his successor in interest shall be and become obligated to pay to the Government a percentage royalty on the net smelter returns or other net proceeds realized from such ore, concentrates, or metal produced within ten (10) years from the date of this contract, until the total amount contributed by the Government, without interest, is fully repaid or said 10 years have elapsed, whichever occurs first, as follows:

Of net smelter returns or other net proceeds not in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent.

Of net smelter returns or other net proceeds in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent, plus one-half (½) percent for each additional full fifty cents ($0.50) in excess of eight dollars ($8.00) per ton of ore, but not in excess of a maximum of five (5) percent.

This obligation to repay from net returns or proceeds shall be and remain a claim and lien upon the mineral deposit which is the subject of the exploration project and upon any production resulting from such discovery or development, in favor of the Government, until fully paid, or until said 10-year period has elapsed; and this claim and lien and the Government's right to repayment shall survive any termination of the contract, whether by completion of the exploration project or otherwise. This article is not to be construed as imposing any obligation on the Operator or his successor in interest to produce ore from any such discovery or development.

16. *No assignment of contract.* Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder.

17. *Termination and completion.* The Government may, at any time, by written notice to the Operator, terminate this contract: (*a*) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contract; (*b*) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (*c*) if in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worthwhile discovery and in the opinion of the Government further operations are not justified. Upon the completion of the project or any termination of the contract the Operator shall render to the Government a full and final accounting of his operations under the contract and his expenditures of money; shall dispose of any unused materials, supplies, and equipment for the joint account of the Operator and the Government in the proportion of their respective interests; and shall pay to the Government its pro-rata share of any money remaining.

Executed in sextuplicate the day and year first above written.

The Dear Consolidated Company and Associates

THE UNITED STATES OF AMERICA

(Operator)

By ---

By ---

U. S. GOVERNMENT PRINTING OFFICE 16—64066-2

6 August 1951

EXPLORATION PROJECT CONTRACT

EXHIBIT "A"

It is proposed to utilize a supply of low grade manganiferous material occuring on Section 23-T48N R27W, in Aitkin County, Minnesota. The mineral apparently occurs in a syncline whose axis is approximately SW-NE. Churn and diamond core drilling indicate a probable ore body roughly rectangular, about 1000' wide, and from 5000' to 6000' long. The thickness of mineralization varies from 150' to 250', but the thicker portions contain leaner streaks, which brings the average more nearly to 150'. This indicates a probable tonnage of 62,000,000. With an average content of recoverable manganese of 3%, this shows the possibility of extracting some 190,000,000 long ton units of manganese.

Preliminary ore dressing work by three independent laboratories demonstrates that greater than 80% manganese recovery is possible when concentrating 4.5% ore to 20%. There should be no difficulty in achieving a similar result even with the grade of the ore falling to nearly 3%. This is due to the unusual characteristic of the formation, wherein the gangue exists chiefly as a very fine clayey material which may be washed away. Further refinement is then effected by gravity separation, such as sink-float.

The area is perfectly flat, and the overburden consists of sandy loam, clay, gravel and boulders to a depth of 150' over the entire ore body. Because of this thickness of overburden, open pit mining operations must be carried out on a large scale to be economical.

With a proposed leaching plant designed for a yearly production of 10,000,000 long ton units of manganese as a 61% manganese sinter, and assuming 350 working days per year in the leaching plant and 300 working days in the mine, ore production would be 11,000 long tons per 24 hours.

Owing to the depth of overburden, the only means of sampling the ore has been through some 40 churn-drill holes and 7 diamond core-drill holes. These show the undoubted existence of an enormous quantity of potential ore, but information on ore dressing and on the actual quality of ore which could be mined is needed.

In order to prove further the extent of the ore body it will be necessary to drill more holes. It is estimated that about 40 more holes should be drilled. Because equipment procurement entails a long delay, and because the large capital outlay magnifies the consequence of errors in calculations, it is considered desirable that run of mine samples, rather than drill cores or sludge, be obtained for ore dressing work. When it is mentioned that the ore dressing will probably entail the expenditure of about $1,000,000, and the leaching and sintering plant about $16,000,000, it can readily be seen that the sinking of an exploratory shaft for sample mining is amply justified.

The undertaking of these exploration measures and ore dressing research is felt to be highly desirable. It is estimated that a saving in plant cost of about 33% may be achieved by this work. The

The plan would call for a period of about one year for exploration, mining of samples, and information gathering for the most economical plant design.

EXPLORATION WORK

Approximately 40 holes are to be drilled to explore further the full extent of the ore body, and to determine its limits. Prevous drilling indicates the apparent axis of the ore body, and drawing E-2, which forms a part of Exhibit "A" shows a system of cross sections set up on 500 ft. centres. The first few holes are shown, to indicate where drilling will commence, but the majority of the holes will be planned from the findings of preceding holes.

The drilling is to be divided between Mesabi type churn drilling, where unusual precautions are used to secure representative samples, and diamond core drilling for structural correlation. The core drilling will constitute one-third of the total footage.

The ore material differs from any now mined in composition and general character, and while cores have been obtained, and more are to be produced, more exact knowledge than can be had from cores is essential to evaluate fully the recovery obtainable and the general feasibility of handling. To state this in another way, the mineral is not sufficiently comparable to anything now being handled in milling practice, and larger amounts must be examined and tested to evaluate the mineral as an ore. To do this, a temporary shaft of minimum dimensions is to be sunk through 150 ft. of overburden and into the mineral body about fifty feet. From the foot of the shaft a small drift is to be driven in both directions at right angles to the apparent axis of the formation. The drifting will permit close examination of the rock in place, and the spoil will afford ample material for thorough testing and examination.

Previous drilling experience on the property has shown the feasibility of using both churn and diamond core drills for exploration, and the two estimates from well-established drilling contractors are considered very reliable.

The area in which this property is situated is known locally the "big swamp", and provision for handling wet ground by the freezing method is made in the estimated cost for shaft sinking. A survey of methods indicates this to be the most economical method, and the estimate attached agrees with estimates made by others.

A recapitulation of drilling and sinking costs is as follows:

Type of Work	Completion Time (from date of approval)	Cost
Exploratory drilling	4 mo.	
8,000 ft. churn drill hole @ $7.00/ft.		$ 56,000.00
4,000 ft. NX core drill hole @ $8.00/ft.		32,000.00
Exploration shaft (using freezing method)	8 mo.	120,000.00
Exploration drifts	12 mo.	36,000.00
Access road		6,000.00
		$250,000.00

ATKINS-WALKER COMPANY
DIAMOND AND CHURN DRILL CONTRACTORS
ALWORTH BUILDING
DULUTH 2, MINN.

August 2, 1951

Mr. J. G. Poore, Manager
Foley Bros., Inc.
900 New York Building
St. Paul, Minnesota

Dear Mr. Poore-

We have outlined below a detailed estimate of the cost of 8000 feet of churn drilling and 4000 feet of core drilling in Sec. 23-48N-27W in Aitkin County, Minnesota.

We have drilled in this section for the Hanna Coal & Ore Corporation and also for the U. S. Bureau of Mines so I think you can definitely rely on our estimated cost of the proposed drilling. Our detailed estimate follows:

Churn drilling in Surface overburden - -	$ 6.00 per ft.
Churn drilling in Ledge, including casing - - - - - - - - - - - - - - - - -	7.50 " "
Diamond core drilling using an NX bit -	10.00 " "
Reaming for casing when necessary - - -	3.50 " "
Blasting down casing in Ledge - - - - -	2.50 " "
Cementing, when necessary - - - - - - -	65.00 per shift
Road building and snow removal - - - - -	At cost
Furnishing water to the drills in the winter season from a distance of more than 500 feet. Operation Steam pump station	25.00 per shift

Based on the above detailed drilling estimate of cost, the totals will approximate as follows:

8000 ft. of churn drilling - - - - - - - - - -	$ 56,000.00
4000 ft. of diamond drilling with NX bits -	40,000.00
NX casing holes in ledge necessary to secure accurate core and sludge samples, for a total of 4000 ft.- - - - - - - - - - -	10,000.00
Estimated cost of road building, preparing drill locations and maintenance of pump station to furnish water to drills during the winter season - - - - - - - - - - - - -	6,000.00

The above figures are exclusive of engineering, assaying, care and disposition of core and sludge samples, which, in the previous drilling, was handled by the Hanna Company and the U. S. Bureau of Mines.

The reason we have figured on the use of NX bits for diamond drilling is because the smaller sizes of bits, such as BX and AX, will not give adequate core recovery.

Trusting that the above figures will give you an indication of the total cost of the drilling program you have outlined, we are

Very truly yours,

ATKINS-WALKER COMPANY

By S. E. Atkins
President

SEA:MCB

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY
MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

Shaft for Managnese Exploration

Conforming with your request of yesterday, I am sending herewith our estimates of the time and cost of sinking a shaft on the site you mentioned about 6 miles north of Aitkin, Minnesota.

We understand that the only purpose of sinking this shaft is to obtain a 1200 ton sample of bedrock at the site chosen, and that the shaft may be allowed to cave or fill after this sample is extracted. We assume that this sample might be logically taken from a shaft of 8 feet inside diameter, sunk 50 feet into bedrock, with one or more 8' x 10' drifts run from the shaft bottom for a total of about 100 feet.

We understand that the location is in or near a part of the "big swamp" and that ground is likely to be saturated from surface down; pumped water might have to be piped some distance to prevent return. We have assumed that work might be scheduled to avoid interference from floods.

In estimating, we have assumed that a good access road would be provided, but that the contractor would furnish all labor, supervision, equipment, material and supplies, including power, and pay all obligatory taxes and insurance, as well as his overhead and profit for the work, in cluding mobilization and cleanup.

We have considered three possible means of undertaking the work:

A. By dewatering from possibly four large churn drill holes with deep well pumps. There is an element of uncertainty in this that could be reduced by study of the overburden. Information gained in pumping might be of value in formulating mining plans and estimates.

B. By drop shaft. We consider this method subject to some undertainty until seal has been made to bedrock. As in "A", a further study of the overburden would help reduce the uncertainty.

August 2, 1951

Foley Brothers, Inc. — #2

C. By freezing the overburden and keeping it frozen till work in bedrock is complete. We regard this method as entirely applicable.

For work under these three methods, our estimates are as follows:

	A. Dewatering	B. Drop Shaft	C. Freezing
Cost through 150' Overburden	$176,000	$157,500	$120,000
Cost Sinking 50' and Drifting 100'	63,000	63,000	63,000
Total Cost	239,000	220,500	183,000
Total Time	6.5 months	5.5 months	6.0 months

The above estimates are based on present wages, prices and availability of men and equipment, on our general knowledge of the area concerned, and they were prepared on very short notice. E. J. Longyear Company reserves freedom of action in any future negotiations concerning this work.

While we are not familiar with all requirements of this work, we cannot help wondering if a sample of, say, 100 tons, taken from five or six 18" holes, might be satisfactory. We think that good core samples of bedrock might be taken by shot drill while overburden would be penetrated by churn drill. Samples could, of course, be taken at various points as desired, and the holes might later be used in initial dewatering prior to mining. We think the cost of this work might be in the order of $90,000.00.

I hope this information will be of use to you, and remain

Sincerely,

E. J. LONGYEAR COMPANY

R. L. Loofbourow

R. L. Loofbourow, Manager,
Mine Contracting Department

RLL;es

c.c. D. M. Davidson

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY
MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

In accordance with our conversation of yesterday, we are pleased to submit below our estimate-proposal covering your contemplated exploratory drilling program which is to be carried out in Sections 23 and 27, 48-27, Aitkin County, Minnesota.

We understand that the work, as now planned, will consist of the drilling of a series of vertical holes, varying from 250' to 400' in depth, and comprising a total of 4,000' of diamond drilling, and 8,000' of Mesabi type churn drilling; that the sizes of the diamond drill holes required may be NX, BX, AX and EX.

For this work we propose to furnish two Longyear Gasoline Driven Diamond Core Drills, together with all the accessory equipment required to accomplish the work as now planned. We further propose to furnish all labor, power and materials and equipment as may be required for the complete performance of the work. We also propose to furnish competent drill crews so as to operate the drills on a single or double-shift basis, depending upon the availability of competent drill operators.

We will carry public liability insurance covering personal injury and property damage; Workmen's Compensation, Old Age Benefit, Unemployment and any other insurance on our employees required by state or federal laws; also, all-risk insurance on the drilling equipment protecting against loss by theft, fire, flood, land-slides and other similar hazards. Certificates showing the coverage referred to will be furnished if desired.

Based upon the conditions as outlined above, we quote as follows:

<u>Overburden drilling, Vertical holes</u>

0 to 100'	in depth,	measured from the collar of the hole	.....	$5.75 per ft.
100 to 200'	" "	ditto	.....	6.50 " "
200 to 300'	" "	ditto	.....	7.25 " "

<u>Diamond Core Drilling</u>

0 to 500' in depth, measured from the collar of the hole

EX size core,	7/8" in diameter	.....	6.50	per ft.
AX " "	1-1/8" " "	.....	7.00	" "
BX " "	1-5/8" " "	.....	7.50	" "
NX " "	2-1/8" " "	.....	8.00	" "

August 2, 1951

Foley Brothers Inc. -- #2

Mesabi Churn Drilling (3" diameter hole)
0 to 500' in depth, measured from the collar of the hole ..... $6.00 per ft.

Advancing casing through ledge material when accomplished
either by blasting or reaming ..... 2.75 " "

Building access roads to drilling site when required ..... 6.50 per hour

Drill hole survey tests ..... 6.00 " "

Delays for your convenience or for which you are responsible ..... 6.00 " "

In addition to the foregoing, it is agreed that the following items will apply to the above quoted drilling rates only, it being understood that these charges are based upon the cost of supplying water to drill holes from the various sources of water supply.

Water supply allowance for drill holes where water is obtainable within
1500' of drill hole location .....15¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
1500', but not more than 3000 ft. from an adequate source
of water supply .....25¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
3000', but not more than 4500 ft. from an adequate source
of water supply ..... 40¢ per ft. drilled

Water supply allowance for drill holes which are in excess
of 4500'. ..... 55¢ per ft. drilled

Samples are to be turned over to your representative at the drill hole locations in receptacles furnished by you.

It is understood that the figures quoted above are based on conditions as of this date, and that they are desired as a basis for appropriation of funds. Because of uncertainty as to when the work might be undertaken, and conditions prevailing at that time, it is understood that this is not to be considered as a binding proposal. However, should it be decided to undertake the work, we should appreciate it if you would give us an opportunity, either to confirm the above proposal, or to make such adjustments as may be appropriate for the conditions at the time the work is undertaken.

Based on past experience on the Cuyuna Range, we would estimate that the average overall cost of the drilling would vary from $7.00 to $8.50 per foot. This, of course, would include cost of casing operations and water supply.

We appreciate the opportunity of discussing this work with you, and shall await with interest your further word.

Yours very truly,
E. J. LONGYEAR COMPANY

W. Davenport,
General Manager

WD;es

MF-200
(June 1951)

Docket No. DMA _____

Commodity _____

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

EXPLORATION PROJECT CONTRACT [1]

It is agreed this _____ day of _____, 195 1, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, hereinafter called the "Government," and [2] The Utah Construction Company and Associates

hereinafter called the "Operator," as follows:

1. *Authority for contract.* This agreement is entered into under the authority of the Defense Production Act of 1950, pursuant to Mineral Order 5, entitled "Regulations Governing Government Aid in Defense Exploration Projects."

2. *Operator's property rights.* The exploration project shall be conducted on that certain property situated in the State of Minnesota County of Aitkin described as follows: [3] all of Section 23 T48N R27W

with respect to which the Operator represents and undertakes: [4]

~~(a) That he is the sole owner, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances as to each of which the subordination agreement of the holder is attached: _____~~

(b) That he is a lessee, in possession and entitled to possession, and the subordination agreement of the lessor is attached.

3. *Exploration project.* The Operator, within thirty days from the date of this contract shall commence work on a project of exploration for [5] manganese; shall prosecute the work efficiently, expertly, in a workmanlike manner, in accordance with good mining standards, with suitable and adequate equipment, materials, and labor, all properly designed to bring the project to completion within a period of [6] twelve months from the date of this contract. The exploration project and the work to be performed are more fully described on Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, is made a part of this contract.

4. *Performance of the work.* The work shall be performed by the Operator, under his sole direction and control: *Provided,* That with the consent of the Government and its written approval of the contract or contracts, all or any part of the work may be performed by the Operator through contract or contracts with independent contractors. The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

5. *Fixtures and improvements.* The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof. Any additional facilities, buildings, and fixtures, to be purchased, installed, or erected by the Operator, with the estimated cost of each, to which the Government will contribute currently its agreed pro rata share, are listed in Exhibit "A" attached hereto. The difference between the cost of such additional facilities, buildings, or fixtures, and the salvage value thereof at the conclusion of the work, shall be charged as a cost of the project to which the Government has contributed its pro rata share.

6. *Operating equipment.* Any operating equipment to be rented, purchased, or furnished by the Operator, with the allowable rental, purchase price, or depreciation, as the case may be, is listed under appropriate headings in Exhibit "A" attached hereto. As to equipment purchased for the project, the Government will contribute its agreed pro rata share of the cost thereof, and the difference between the cost and the salvage value at the conclusion of the work shall be charged as a cost of the project to which the Government has contributed its pro rata share.

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] State name, address, and nature of organization if any.
[3] Give legal description or enough to identify the property.
[4] Strike out the provision not applicable.
[5] Name of mineral.
[6] Not in excess of 2 years.

7. *Title to and disposition of property.* [illegible]ilities, buildings, fixtures, equipment, or [illegible] items costing more than $50 each, paid for or purchased with funds contributed jointly by the Operator and the Government, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the termination of the contract, if they have any salvage value, shall be disposed of for their joint account unless the Government, in writing, waives its interest in any such items. The Government may require the dismantling, severance from land, and removal of any such items in order to realize its interest in the salvage value thereof, and the cost of any such removal and of the disposal of the items shall be for the joint account of the parties in proportion to their respective interests.

8. *Labor and supervision.* An itemized schedule of labor, by numbers and classes (miners, muckers, millmen, etc.), and of supervisors, by numbers and positions, with the maximum wages or salaries that may be paid to each as an allowable cost of the project is set forth in Exhibit "A" attached hereto.

9. *Rehabilitation and repairs.* A statement of the cost of any necessary rehabilitation or repairs to put existing facilities, buildings, installations, and fixtures into useful and operable condition and which are to be allowed as costs of the project is included in Exhibit "A."

10. *Allowable costs of the project.* The costs of the project in which the Government will participate are limited to the necessary, reasonable, direct costs of performing the exploration work, including the costs of materials, supplies, engineering, power, water, analytical work, accounting, and utilities, including items of equipment costing less than $50 each; and the costs referred to in Articles 5, 6, 8, and 9, and the exhibits annexed to and referred to in this contract. Although the Government may pay part of the cost of new or additional facilities, structures, buildings, and equipment, only the depreciation on such items, computed as indicated in Articles 5 and 6, will be charged as a cost of the project. No items of general overhead, corporate management, interest, taxes, or any other indirect costs not expressly allowed by these provisions, or work performed or costs incurred before the date of this contract, shall be allowed as costs of the project in which the Government will participate.

11. *Accounts and audits.* The Operator shall keep suitable records and accounts of operations, which the Government may inspect and audit at any time. The Government may at any time require an audit of the Operator's records and accounts by a certified public accountant, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract.

12. *Progress reports.* The Operator shall provide the Government with monthly reports of work performed under the contract upon forms to be provided by the Government. Each monthly progress report shall bear the certification of the Operator and shall constitute the Operator's invoice of costs incurred on the project during the period covered by the report.

13. *Payment to the Operator.* The monthly progress report (invoice), to the extent approved by the Government, shall be processed for payment by the Government. Payment shall be made in the amount of 75 percent of the approved costs incurred; *Provided,* That the aggregate total of all sums paid by the Government under this agreement shall not exceed $187,500.00 which is 75 percent of the agreed estimated total cost of this project, $250,000.00.

14. *Final reports by Operator.* Upon completion of the project or termination of this contract, the Operator shall provide the Government with a comprehensive geologic and engineering report, including an estimate of ore reserves, to the best of his ability. Four copies of all reports shall be furnished to the Government.

15. *Repayment by Operator.* If, upon the completion of the exploration project or termination of the contract, the Government considers that a discovery or development has resulted from the work from which commercial production of ore may be made, the Government, within 6 months thereafter, shall so certify to the Operator, particularly describing and delimiting its estimate of the discovery or the development. Thereafter, if and as ore is produced as a result of such discovery or development, the Operator and his successor in interest shall be and become obligated to pay to the Government a percentage royalty on the net smelter returns or other net proceeds realized from such ore, concentrates, or metal produced within ten (10) years from the date of this contract, until the total amount contributed by the Government, without interest, is fully repaid or said 10 years have elapsed, whichever occurs first, as follows:

Of net smelter returns or other net proceeds not in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent.

Of net smelter returns or other net proceeds in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent, plus one-half (½) percent for each additional full fifty cents ($0.50) in excess of eight dollars ($8.00) per ton of ore, but not in excess of a maximum of five (5) percent.

This obligation to repay from net returns or proceeds shall be and remain a claim and lien upon the mineral deposit which is the subject of the exploration project and upon any production resulting from such discovery or development, in favor of the Government, until fully paid, or until said 10-year period has elapsed; and this claim and lien and the Government's right to repayment shall survive any termination of the contract, whether by completion of the exploration project or otherwise. This article is not to be construed as imposing any obligation on the Operator or his successor in interest to produce ore from any such discovery or development.

16. *No assignment of contract.* Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder.

17. *Termination and completion.* The Government may, at any time, by written notice to the Operator, terminate this contract: (*a*) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contract; (*b*) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (*c*) if in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worthwhile discovery and in the opinion of the Government further operations are not justified. Upon the completion of the project or any termination of the contract the Operator shall render to the Government a full and final accounting of his operations under the contract and his expenditures of money; shall dispose of any unused materials, supplies, and equipment for the joint account of the Operator and the Government in the proportion of their respective interests; and shall pay to the Government its pro-rata share of any money remaining.

Executed in sextuplicate the day and year first above written.

The Utah Construction Company and Associates

(Operator)

By

THE UNITED STATES OF AMERICA

By

U. S. GOVERNMENT PRINTING OFFICE 16—64066-2

6 August 1951

EXPLORATION PROJECT CONTRACT

EXHIBIT "A"

It is proposed to utilize a supply of low grade manganiferous material occuring on Section 23-T48N R27W, in Aitkin County, Minnesota. The mineral apparently occurs in a syncline whose axis is approximately SW-NE. Churn and diamond core drilling indicate a probable ore body roughly rectangular, about 1000' wide, and from 5000' to 6000' long. The thickness of mineralization varies from 150' to 250', but the thicker portions contain leaner streaks, which brings the average more nearly to 150'. This indicates a probable tonnage of 62,000,000. With an average content of recoverable manganese of 3%, this shows the possibility of extracting some 190,000,000 long ton units of manganese.

Preliminary ore dressing work by three independent laboratories demonstrates that greater than 80% manganese recovery is possible when concentrating 4.5% ore to 20%. There should be no difficulty in achieving a similar result even with the grade of the ore falling to nearly 3%. This is due to the unusual characteristic of the formation, wherein the gangue exists chiefly as a very fine clayey material which may be washed away. Further refinement is then effecte by gravity separation, such as sink-float.

The area is perfectly flat, and the overburden consists of sandy loam, clay, gravel and boulders to a depth of 150' over the entire ore body. Because of this thickness of overburden, open pit mining operations must be carried out on a large scale to be economical.

With a proposed leaching plant designed for a yearly production of 10,000,000 long ton units of manganese as a 61% manganese sinter, and assuming 350 working days per year in the leaching plant and 300 working days in the mine, ore production would be 11,000 long tons per 24 hours.

Owing to the depth of overburden, the only means of sampling the ore has been through some 40 churn-drill holes and 7 diamond core-drill holes. These show the undoubted existence of an enormous quantity of potential ore, but information on ore dressing and on the actual quality of ore which could be mined is needed.

In order to prove further the extent of the ore body it will be necessary to drill more holes. It is estimated that about 40 more holes should be drilled. Because equipment procurement entails a long delay, and because the large capital outlay magnifies the consequence of errors in calculations, it is considered desirable that run of mine samples, rather than drill cores or sludge, be obtained for ore dressing work. When it is mentioned that the ore dressing will probably entail the expenditure of about $1,000,000, and the leaching and sintering plant about $16,000,000, it can readily be seen that the sinking of an exploratory shaft for sample mining is amply justified.

The undertaking of these exploration measures and ore dressing research is felt to be highly desirable. It is estimated that a saving in plant cost of about 33% may be achieved by this work. The

The plan would [illegible]l for a period of about [illegible]e year for exploration, mining of samples, and information gathering for the most economical plant design.

EXPLORATION WORK

Approximately 40 holes are to be drilled to explore further the full extent of the ore body, and to determine its limits. Prevous drilling indicates the apparent axis of the ore body, and drawing E-2, which forms a part of Exhibit "A" shows a system of cross sections set up on 500 ft. centres. The first few holes are shown, to indicate where drilling will commence, but the majority of the holes will be planned from the findings of preceding holes.

The drilling is to be divided between Mesabi type churn drilling, where unusual precautions are used to secure representative samples, and diamond core drilling for structural correlation. The core drilling will constitute one-third of the total footage.

The ore material differs from any now mined in composition and general character, and while cores have been obtained, and more are to be produced, more exact knowledge than can be had from cores is essential to evaluate fully the recovery obtainable and the general feasibility of handling. To state this in another way, the mineral is not sufficiently comparable to anything now being handled in milling practice, and larger amounts must be examined and tested to evaluate the mineral as an ore. To do this, a temporary shaft of minimum dimensions is to be sunk through 150 ft. of overburden and into the mineral body about fifty feet. From the foot of the shaft a small drift is to be driven in both directions at right angles to the apparent axis of the formation. The drifting will permit close examination of the rock in place, and the spoil will afford ample material for thorough testing and examination.

Previous drilling experience on the property has shown the feasibility of using both churn and diamond core drills for exploration, and the two estimates from well-established drilling contractors are considered very reliable.

The area in which this property is situated is known locally the "big swamp", and provision for handling wet ground by the freezing method is made in the estimated cost for shaft sinking. A survey of methods indicates this to be the most economical method, and the estimate attached agrees with estimates made by others.

A recapitulation of drilling and sinking costs is as follows:

Type of Work	Completion Time (from date of approval)	Cost
Exploratory drilling	4 mo.	
8,000 ft. churn drill hole @ $7.00/ft.		$ 56,000.00
4,000 ft. NX core drill hole @ $8.00/ft.		32,000.00
Exploration shaft (using freezing method)	8 mo.	120,000.00
Exploration drifts	12 mo.	36,000.00
Access road		6,000.00
		$250,000.00

ATKINS-WALKER COMPANY
DIAMOND AND CHURN DRILL CONTRACTORS
ALWORTH BUILDING
DULUTH 2, MINN.

August 2, 1951

Mr. J. G. Poore, Manager
Foley Bros., Inc.
900 New York Building
St. Paul, Minnesota

Dear Mr. Poore-

We have outlined below a detailed estimate of the cost of 8000 feet of churn drilling and 4000 feet of core drilling in Sec. 23-48N-27W in Aitkin County, Minnesota.

We have drilled in this section for the Hanna Coal & Ore Corporation and also for the U. S. Bureau of Mines so I think you can definitely rely on our estimated cost of the proposed drilling. Our detailed estimate follows:

Churn drilling in Surface overburden - -	$ 6.00 per ft.
Churn drilling in Ledge, including casing - - - - - - - - - - - - - - - -	7.50 " "
Diamond core drilling using an NX bit -	10.00 " "
Reaming for casing when necessary - - -	3.50 " "
Blasting down casing in Ledge - - - - -	2.50 " "
Cementing, when necessary - - - - - - -	65.00 per shift
Road building and snow removal - - - - -	At cost
Furnishing water to the drills in the winter season from a distance of more than 500 feet. Operation Steam pump station	25.00 per shift

Based on the above detailed drilling estimate of cost, the totals will approximate as follows:

8000 ft. of churn drilling - - - - - - - - - -	$ 56,000.00
4000 ft. of diamond drilling with NX bits -	40,000.00
NX casing holes in ledge necessary to secure accurate core and sludge samples, for a total of 4000 ft.- - - - - - - - - - -	10,000.00
Estimated cost of road building, preparing drill locations and maintenance of pump station to furnish water to drills during the winter season - - - - - - - - - - - -	6,000.00

The above figures are exclusive of engineering, assaying, care and disposition of core and sludge samples, which, in the previous drilling, was handled by the Hanna Company and the U. S. Bureau of Mines.

The reason we have figured on the use of NX bits for diamond drilling is because the smaller sizes of bits, such as BX and AX, will not give adequate core recovery.

Trusting that the above figures will give you an indication of the total cost of the drilling program you have outlined, we are

Very truly yours,

ATKINS-WALKER COMPANY

By S. E. Atkins
President

SEA:MCB

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY
MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

Shaft for Managnese Exploration

Conforming with your request of yesterday, I am sending herewith our estimates of the time and cost of sinking a shaft on the site you mentioned about 6 miles north of Aitkin, Minnesota.

We understand that the only purpose of sinking this shaft is to obtain a 1200 ton sample of bedrock at the site chosen, and that the shaft may be allowed to cave or fill after this sample is extracted. We assume that this sample might be logically taken from a shaft of 8 feet inside diameter, sunk 50 feet into bedrock, with one or more 8' x 10' drifts run from the shaft bottom for a total of about 100 feet.

We understand that the location is in or near a part of the "big swamp" and that ground is likely to be saturated from surface down; pumped water might have to be piped some distance to prevent return. We have assumed that work might be scheduled to avoid interference from floods.

In estimating, we have assumed that a good access road would be provided, but that the contractor would furnish all labor, supervision, equipment, material and supplies, including power, and pay all obligatory taxes and insurance, as well as his overhead and profit for the work, in cluding mobilization and cleanup.

We have considered three possible means of undertaking the work:

A. By dewatering from possibly four large churn drill holes with deep well pumps. There is an element of uncertainty in this that could be reduced by study of the overburden. Information gained in pumping might be of value in formulating mining plans and estimates.

B. By drop shaft. We consider this method subject to some undertainty until seal has been made to bedrock. As in "A", a further study of the overburden would help reduce the uncertainty.

August 2, 1951

Foley Brothers, Inc. — #2

C. By freezing the overburden and keeping it frozen till work in bedrock is complete. We regard this method as entirely applicable.

For work under these three methods, our estimates are as follows:

	A. Dewatering	B. Drop Shaft	C. Freezing
Cost through 150' Overburden	$176,000	$157,500	$120,000
Cost Sinking 50' and Drifting 100'	63,000	63,000	63,000
Total Cost	239,000	220,500	183,000
Total Time	6.5 months	5.5 months	6.0 months

The above estimates are based on present wages, prices and availability of men and equipment, on our general knowledge of the area concerned, and they were prepared on very short notice. E. J. Longyear Company reserves freedom of action in any future negotiations concerning this work.

While we are not familiar with all requirements of this work, we cannot help wondering if a sample of, say, 100 tons, taken from five or six 18" holes, might be satisfactory. We think that good core samples of bedrock might be taken by shot drill while overburden would be penetrated by churn drill. Samples could, of course, be taken at various points as desired, and the holes might later be used in initial dewatering prior to mining. We think the cost of this work might be in the order of $90,000.00.

I hope this information will be of use to you, and remain

Sincerely,

E. J. LONGYEAR COMPANY

R. L. Loofbourow, Manager,
Mine Contracting Department

RLL;es

c.c. D. M. Davidson

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY
MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

In accordance with our conversation of yesterday, we are pleased to submit below our estimate-proposal covering your contemplated exploratory drilling program which is to be carried out in Sections 23 and 27, 48-27, Aitkin County, Minnesota.

We understand that the work, as now planned, will consist of the drilling of a series of vertical holes, varying from 250' to 400' in depth, and comprising a total of 4,000' of diamond drilling, and 8,000' of Mesabi type churn drilling; that the sizes of the diamond drill holes required may be NX, BX, AX and EX.

For this work we propose to furnish two Longyear Gasoline Driven Diamond Core Drills, together with all the accessory equipment required to accomplish the work as now planned. We further propose to furnish all labor, power and materials and equipment as may be required for the complete performance of the work. We also propose to furnish competent drill crews so as to operate the drills on a single or double-shift basis, depending upon the availability of competent drill operators.

We will carry public liability insurance covering personal injury and property damage; Workmen's Compensation, Old Age Benefit, Unemployment and any other insurance on our employees required by state or federal laws; also, all-risk insurance on the drilling equipment protecting against loss by theft, fire, flood, land-slides and other similar hazards. Certificates showing the coverage referred to will be furnished if desired.

Based upon the conditions as outlined above, we quote as follows:

<u>Overburden drilling, Vertical holes</u>

0 to 100' in depth, measured from the collar of the hole	.....	$5.75	per	ft.
100 to 200' " " ditto	.....	6.50	"	"
200 to 300' " " ditto	.....	7.25	"	"

<u>Diamond Core Drilling</u>

0 to 500' in depth, measured from the collar of the hole

EX size core, 7/8" in diameter	.....	6.50	per	ft.
AX " " 1-1/8" " "	.....	7.00	"	"
BX " " 1-5/8" " "	.....	7.50	"	"
NX " " 2-1/8" " "	.....	8.00	"	"

August 2, 1951

Foley Brothers Inc. — #2

Mesabi Churn Drilling (3" diameter hole)
0 to 500' in depth, measured from the collar of the hole ..... $6.00 per ft.

Advancing casing through ledge material when accomplished
either by blasting or reaming ..... 2.75 " "

Building access roads to drilling site when required ..... 6.50 per hour

Drill hole survey tests ..... 6.00 " "

Delays for your convenience or for which you are responsible ..... 6.00 " "

In addition to the foregoing, it is agreed that the following items will apply to the above quoted drilling rates only, it being understood that these charges are based upon the cost of supplying water to drill holes from the various sources of water supply.

Water supply allowance for drill holes where water is obtainable within
1500' of drill hole location .....15¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
1500', but not more than 3000 ft. from an adequate source
of water supply .....25¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
3000', but not more than 4500 ft. from an adequate source
of water supply ..... 40¢ per ft. drilled

Water supply allowance for drill holes which are in excess
of 4500'. ..... 55¢ per ft. drilled

Samples are to be turned over to your representative at the drill hole locations in receptacles furnished by you.

It is understood that the figures quoted above are based on conditions as of this date, and that they are desired as a basis for appropriation of funds. Because of uncertainty as to when the work might be undertaken, and conditions prevailing at that time, it is understood that this is not to be considered as a binding proposal. However, should it be decided to undertake the work, we should appreciate it if you would give us an opportunity, either to confirm the above proposal, or to make such adjustments as may be appropriate for the conditions at the time the work is undertaken.

Based on past experience on the Cuyuna Range, we would estimate that the average overall cost of the drilling would vary from $7.00 to $8.50 per foot. This, of course, would include cost of casing operations and water supply.

We appreciate the opportunity of discussing this work with you, and shall await with interest your further word.

Yours very truly,
E. J. LONGYEAR COMPANY

W. Davenport,
General Manager

WD;es

MF-200
(June 1951)

Docket No. DMA _____
Commodity _____

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

EXPLORATION PROJECT CONTRACT [1]

It is agreed this _____ day of _____, 1951, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, hereinafter called the "Government," and [2] The Utah Construction Company and Associates

hereinafter called the "Operator," as follows:

1. *Authority for contract.* This agreement is entered into under the authority of the Defense Production Act of 1950, pursuant to Mineral Order 5, entitled "Regulations Governing Government Aid in Defense Exploration Projects."

2. *Operator's property rights.* The exploration project shall be conducted on that certain property situated in the State of Minnesota, County of Aitkin described as follows: [3] all of Section 23 T48N R27W

with respect to which the Operator represents and undertakes: [4]

~~(a) That he is the sole owner, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances as to each of which the subordination agreement of the holder is attached.~~

(b) That he is a lessee, in possession and entitled to possession, and the subordination agreement of the lessor is attached.

3. *Exploration project.* The Operator, within THIRTY days from the date of this contract shall commence work on a project of exploration for [5] MANGANESE; shall prosecute the work efficiently, expertly, in a workmanlike manner, in accordance with good mining standards, with suitable and adequate equipment, materials, and labor, all properly designed to bring the project to completion within a period of [6] TWELVE MONTHS from the date of this contract. The exploration project and the work to be performed are more fully described on Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, is made a part of this contract.

4. *Performance of the work.* The work shall be performed by the Operator, under his sole direction and control: *Provided,* That with the consent of the Government and its written approval of the contract or contracts, all or any part of the work may be performed by the Operator through contract or contracts with independent contractors. The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

5. *Fixtures and improvements.* The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof. Any additional facilities, buildings, and fixtures, to be purchased, installed, or erected by the Operator, with the estimated cost of each, to which the Government will contribute currently its agreed pro rata share, are listed in Exhibit "A" attached hereto. The difference between the cost of such additional facilities, buildings, or fixtures, and the salvage value thereof at the conclusion of the work, shall be charged as a cost of the project to which the Government has contributed its pro rata share.

6. *Operating equipment.* Any operating equipment to be rented, purchased, or furnished by the Operator, with the allowable rental, purchase price, or depreciation, as the case may be, is listed under appropriate headings in Exhibit "A" attached hereto. As to equipment purchased for the project, the Government will contribute its agreed pro rata share of the cost thereof, and the difference between the cost and the salvage value at the conclusion of the work shall be charged as a cost of the project to which the Government has contributed its pro rata share.

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] State name, address, and nature of organization if any.
[3] Give legal description or enough to identify the property.
[4] Strike out the provision not applicable.
[5] Name of mineral.
[6] Not in excess of 2 years.

7. *Title to and disposition of property.* All facilities, buildings, fixtures, equipment, other items costing more than $50 each, paid for or purchased with funds contributed jointly by the Operator and the Government, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the termination of the contract, if they have any salvage value, shall be disposed of for their joint account unless the Government, in writing, waives its interest in any such items. The Government may require the dismantling, severance from land, and removal of any such items in order to realize its interest in the salvage value thereof, and the cost of any such removal and of the disposal of the items shall be for the joint account of the parties in proportion to their respective interests.

8. *Labor and supervision.* An itemized schedule of labor, by numbers and classes (miners, muckers, millmen, etc.), and of supervisors, by numbers and positions, with the maximum wages or salaries that may be paid to each as an allowable cost of the project is set forth in Exhibit "A" attached hereto.

9. *Rehabilitation and repairs.* A statement of the cost of any necessary rehabilitation or repairs to put existing facilities, buildings, installations, and fixtures into useful and operable condition and which are to be allowed as costs of the project is included in Exhibit "A."

10. *Allowable costs of the project.* The costs of the project in which the Government will participate are limited to the necessary, reasonable, direct costs of performing the exploration work, including the costs of materials, supplies, engineering, power, water, analytical work, accounting, and utilities, including items of equipment costing less than $50 each; and the costs referred to in Articles 5, 6, 8, and 9, and the exhibits annexed to and referred to in this contract. Although the Government may pay part of the cost of new or additional facilities, structures, buildings, and equipment, only the depreciation on such items, computed as indicated in Articles 5 and 6, will be charged as a cost of the project. No items of general overhead, corporate management, interest, taxes, or any other indirect costs not expressly allowed by these provisions, or work performed or costs incurred before the date of this contract, shall be allowed as costs of the project in which the Government will participate.

11. *Accounts and audits.* The Operator shall keep suitable records and accounts of operations, which the Government may inspect and audit at any time. The Government may at any time require an audit of the Operator's records and accounts by a certified public accountant, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract.

12. *Progress reports.* The Operator shall provide the Government with monthly reports of work performed under the contract upon forms to be provided by the Government. Each monthly progress report shall bear the certification of the Operator and shall constitute the Operator's invoice of costs incurred on the project during the period covered by the report.

13. *Payment to the Operator.* The monthly progress report (invoice), to the extent approved by the Government, shall be processed for payment by the Government. Payment shall be made in the amount of 75 percent of the approved costs incurred; *Provided,* That the aggregate total of all sums paid by the Government under this agreement shall not exceed $187,500.00, which is 75 percent of the agreed estimated total cost of this project, $250,000.00.

14. *Final reports by Operator.* Upon completion of the project or termination of this contract, the Operator shall provide the Government with a comprehensive geologic and engineering report, including an estimate of ore reserves, to the best of his ability. Four copies of all reports shall be furnished to the Government.

15. *Repayment by Operator.* If, upon the completion of the exploration project or termination of the contract, the Government considers that a discovery or development has resulted from the work from which commercial production of ore may be made, the Government, within 6 months thereafter, shall so certify to the Operator, particularly describing and delimiting its estimate of the discovery or the development. Thereafter, if and as ore is produced as a result of such discovery or development, the Operator and his successor in interest shall be and become obligated to pay to the Government a percentage royalty on the net smelter returns or other net proceeds realized from such ore, concentrates, or metal produced within ten (10) years from the date of this contract, until the total amount contributed by the Government, without interest, is fully repaid or said 10 years have elapsed, whichever occurs first, as follows:

Of net smelter returns or other net proceeds not in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent.

Of net smelter returns or other net proceeds in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent, plus one-half (½) percent for each additional full fifty cents ($0.50) in excess of eight dollars ($8.00) per ton of ore, but not in excess of a maximum of five (5) percent.

This obligation to repay from net returns or proceeds shall be and remain a claim and lien upon the mineral deposit which is the subject of the exploration project and upon any production resulting from such discovery or development, in favor of the Government, until fully paid, or until said 10-year period has elapsed; and this claim and lien and the Government's right to repayment shall survive any termination of the contract, whether by completion of the exploration project or otherwise. This article is not to be construed as imposing any obligation on the Operator or his successor in interest to produce ore from any such discovery or development.

16. *No assignment of contract.* Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder.

17. *Termination and completion.* The Government may, at any time, by written notice to the Operator, terminate this contract: (*a*) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contract; (*b*) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (*c*) if in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worthwhile discovery and in the opinion of the Government further operations are not justified. Upon the completion of the project or any termination of the contract the Operator shall render to the Government a full and final accounting of his operations under the contract and his expenditures of money; shall dispose of any unused materials, supplies, and equipment for the joint account of the Operator and the Government in the proportion of their respective interests; and shall pay to the Government its pro-rata share of any money remaining.

Executed in sextuplicate the day and year first above written.

The Utah Construction Company and Associates
(Operator)

By

THE UNITED STATES OF AMERICA

By

U. S. GOVERNMENT PRINTING OFFICE 16—64066-2

6 August 1951

EXPLORATION PROJECT CONTRACT

EXHIBIT "A"

It is proposed to utilize a supply of low grade manganiferous material occuring on Section 23-T48N R27W, in Aitkin County, Minnesota. The mineral apparently occurs in a syncline whose axis is approximately SW-NE. Churn and diamond core drilling indicate a probable ore body roughly rectangular, about 1000' wide, and from 5000' to 6000' long. The thickness of mineralization varies from 150' to 250', but the thicker portions contain leaner streaks, which bring the average more nearly to 150'. This indicates a probable tonnage of 62,000,000. With an average content of recoverable manganese of 3%, this shows the possibility of extracting some 190,000,000 long ton units of manganese.

Preliminary ore dressing work by three independent laboratories demonstrates that greater than 80% manganese recovery is possible when concentrating 4.5% ore to 20%. There should be no difficulty in achieving a similar result even with the grade of the ore falling to nearly 3%. This is due to the unusual characteristic of the formation, wherein the gangue exists chiefly as a very fine clayey material which may be washed away. Further refinement is then effected by gravity separation, such as sink-float.

The area is perfectly flat, and the overburden consists of sandy loam, clay, gravel and boulders to a depth of 150' over the entire ore body. Because of this thickness of overburden, open pit mining operations must be carried out on a large scale to be economical.

With a proposed leaching plant designed for a yearly production of 10,000,000 long ton units of manganese as a 61% manganese sinter, and assuming 350 working days per year in the leaching plant and 300 working days in the mine, ore production would be 11,000 long tons per 24 hours.

Owing to the depth of overburden, the only means of sampling the ore has been through some 40 churn-drill holes and 7 diamond core-drill holes. These show the undoubted existence of an enormous quantity of potential ore, but information on ore dressing and on the actual quality of ore which could be mined is needed.

In order to prove further the extent of the ore body it will be necessary to drill more holes. It is estimated that about 40 more holes should be drilled. Because equipment procurement entails a long delay, and because the large capital outlay magnifies the consequence of errors in calculations, it is considered desirable that run of mine samples, rather than drill cores or sludge, be obtained for ore dressing work. When it is mentioned that the ore dressing will probably entail the expenditure of about $1,000,000, and the leaching and sintering plant about $16,000,000, it can readily be seen that the sinking of an exploratory shaft for sample mining is amply justified.

The undertaking of these exploration measures and ore dressing research is felt to be highly desirable. It is estimated that a saving in plant cost of about 33% may be achieved by this work. The

The plan would [illegible]ll for a period of about [illegible]e year for exploration, mining of samples, and information gathering for the most economical plant design.

EXPLORATION WORK

Approximately 40 holes are to be drilled to explore further the full extent of the ore body, and to determine its limits. Prevous drilling indicates the apparent axis of the ore body, and drawing E-2, which forms a part of Exhibit "A" shows a system of cross sections set up on 500 ft. centres. The first few holes are shown, to indicate where drilling will commence, but the majority of the holes will be planned from the findings of preceding holes.

The drilling is to be divided between Mesabi type churn drilling, where unusual precautions are used to secure representative samples, and diamond core drilling for structural correlation. The core drilling will constitute one-third of the total footage.

The ore material differs from any now mined in composition and general character, and while cores have been obtained, and more are to be produced, more exact knowledge than can be had from cores is essential to evaluate fully the recovery obtainable and the general feasibility of handling. To state this in another way, the mineral is not sufficiently comparable to anything now being handled in milling practice, and larger amounts must be examined and tested to evaluate the mineral as an ore. To do this, a temporary shaft of minimum dimensions is to be sunk through 150 ft. of overburden and into the mineral body about fifty feet. From the foot of the shaft a small drift is to be driven in both directions at right angles to the apparent axis of the formation. The drifting will permit close examination of the rock in place, and the spoil will afford ample material for thorough testing and examination.

Previous drilling experience on the property has shown the feasibility of using both churn and diamond core drills for exploration, and the two estimates from well-established drilling contractors are considered very reliable.

The area in which this property is situated is known locally the "big swamp", and provision for handling wet ground by the freezing method is made in the estimated cost for shaft sinking. A survey of methods indicates this to be the most economical method, and the estimate attached agrees with estimates made by others.

A recapitulation of drilling and sinking costs is as follows:

Type of Work	Completion Time (from date of approval)	Cost
Exploratory drilling	4 mo.	
8,000 ft. churn drill hole @ $7.00/ft.		$ 56,000.00
4,000 ft. NX core drill hole @ $8.00/ft.		32,000.00
Exploration shaft (using freezing method)	8 mo.	120,000.00
Exploration drifts	12 mo.	36,000.00
Access road		6,000.00
		$250,000.00

ATKINS-WALKER COMPANY
DIAMOND AND CHURN DRILL CONTRACTORS
ALWORTH BUILDING
DULUTH 2, MINN.

August 2, 1951

Mr. J. G. Poore, Manager
Foley Bros., Inc.
900 New York Building
St. Paul, Minnesota

Dear Mr. Poore-

We have outlined below a detailed estimate of the cost of 8000 feet of churn drilling and 4000 feet of core drilling in Sec. 23-48N-27W in Aitkin County, Minnesota.

We have drilled in this section for the Hanna Coal & Ore Corporation and also for the U. S. Bureau of Mines so I think you can definitely rely on our estimated cost of the proposed drilling. Our detailed estimate follows:

Churn drilling in Surface overburden - -	$ 6.00 per ft.
Churn drilling in Ledge, including casing - - - - - - - - - - - - - - - -	7.50 " "
Diamond core drilling using an NX bit -	10.00 " "
Reaming for casing when necessary - - -	3.50 " "
Blasting down casing in Ledge - - - - -	2.50 " "
Cementing, when necessary - - - - - - -	65.00 per shift
Road building and snow removal - - - - -	At cost
Furnishing water to the drills in the winter season from a distance of more than 500 feet. Operation Steam pump station	25.00 per shift

Based on the above detailed drilling estimate of cost, the totals will approximate as follows:

8000 ft. of churn drilling - - - - - - - - - -	$ 56,000.00
4000 ft. of diamond drilling with NX bits -	40,000.00
NX casing holes in ledge necessary to secure accurate core and sludge samples, for a total of 4000 ft. - - - - - - - - - -	10,000.00
Estimated cost of road building, preparing drill locations and maintenance of pump station to furnish water to drills during the winter season - - - - - - - - - - - -	6,000.00

The above figures are exclusive of engineering, assaying, care and disposition of core and sludge samples, which, in the previous drilling, was handled by the Hanna Company and the U. S. Bureau of Mines.

The reason we have figured on the use of NX bits for diamond drilling is because the smaller sizes of bits, such as BX and AX, will not give adequate core recovery.

Trusting that the above figures will give you an indication of the total cost of the drilling program you have outlined, we are

Very truly yours,

ATKINS-WALKER COMPANY

By S. E. Atkins
President

SEA:MCB

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY
MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

In accordance with our conversation of yesterday, we are pleased to submit below our estimate-proposal covering your contemplated exploratory drilling program which is to be carried out in Sections 23 and 27, 48-27, Aitkin County, Minnesota.

We understand that the work, as now planned, will consist of the drilling of a series of vertical holes, varying from 250' to 400' in depth, and comprising a total of 4,000' of diamond drilling, and 8,000' of Mesabi type churn drilling; that the sizes of the diamond drill holes required may be NX, BX, AX and EX.

For this work we propose to furnish two Longyear Gasoline Driven Diamond Core Drills, together with all the accessory equipment required to accomplish the work as now planned. We further propose to furnish all labor, power and materials and equipment as may be required for the complete performance of the work. We also propose to furnish competent drill crews so as to operate the drills on a single or double-shift basis, depending upon the availability of competent drill operators.

We will carry public liability insurance covering personal injury and property damage; Workmen's Compensation, Old Age Benefit, Unemployment and any other insurance on our employees required by state or federal laws; also, all-risk insurance on the drilling equipment protecting against loss by theft, fire, flood, land-slides and other similar hazards. Certificates showing the coverage referred to will be furnished if desired.

Based upon the conditions as outlined above, we quote as follows:

<u>Overburden drilling, Vertical holes</u>

0 to 100' in depth, measured from the collar of the hole	.....	$5.75 per ft.
100 to 200' " " ditto	.....	6.50 " "
200 to 300' " " ditto	.....	7.25 " "

<u>Diamond Core Drilling</u>

0 to 500' in depth, measured from the collar of the hole

EX size core, 7/8" in diameter	.....	6.50 per ft.
AX " " 1-1/8" " "	.....	7.00 " "
BX " " 1-5/8" " "	.....	7.50 " "
NX " " 2-1/8" " "	.....	8.00 " "

August 2, 1951

Foley Brothers Inc. — #2

Mesabi Churn Drilling (3" diameter hole)
0 to 500' in depth, measured from the collar of the hole ..... $6.00 per ft.

Advancing casing through ledge material when accomplished
either by blasting or reaming ..... 2.75 " "

Building access roads to drilling site when required ..... 6.50 per hour

Drill hole survey tests ..... 6.00 " "

Delays for your convenience or for which you are responsible ..... 6.00 " "

In addition to the foregoing, it is agreed that the following items will apply to the above quoted drilling rates only, it being understood that these charges are based upon the cost of supplying water to drill holes from the various sources of water supply.

Water supply allowance for drill holes where water is obtainable within
1500' of drill hole location .....15¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
1500', but not more than 3000 ft. from an adequate source
of water supply .....25¢ per ft. drilled

Water supply allowance for drill holes which are in excess of
3000', but not more than 4500 ft. from an adequate source
of water supply ..... 40¢ per ft. drilled

Water supply allowance for drill holes which are in excess
of 4500'. ..... 55¢ per ft. drilled

Samples are to be turned over to your representative at the drill hole locations in receptacles furnished by you.

It is understood that the figures quoted above are based on conditions as of this date, and that they are desired as a basis for appropriation of funds. Because of uncertainty as to when the work might be undertaken, and conditions prevailing at that time, it is understood that this is not to be considered as a binding proposal. However, should it be decided to undertake the work, we should appreciate it if you would give us an opportunity, either to confirm the above proposal, or to make such adjustments as may be appropriate for the conditions at the time the work is undertaken.

Based on past experience on the Cuyuna Range, we would estimate that the average overall cost of the drilling would vary from $7.00 to $8.50 per foot. This, of course, would include cost of casing operations and water supply.

We appreciate the opportunity of discussing this work with you, and shall await with interest your further word.

Yours very truly,
E. J. LONGYEAR COMPANY

W. Davenport,
General Manager

WD;es

DIAMOND DRILLING
SHAFT SINKING
GEOLOGICAL AND MINING REPORTS
MANUFACTURE OF DIAMOND DRILLS AND SUPPLIES

E. J. LONGYEAR COMPANY
MINING ENGINEERS
GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA

August 2, 1951

Mr. J. G. Poore
Foley Brothers Inc.
New York Building
St. Paul 1, Minn.

Dear Mr. Poore:

Shaft for Managnese Exploration

Conforming with your request of yesterday, I am sending herewith our estimates of the time and cost of sinking a shaft on the site you mentioned about 6 miles north of Aitkin, Minnesota.

We understand that the only purpose of sinking this shaft is to obtain a 1200 ton sample of bedrock at the site chosen, and that the shaft may be allowed to cave or fill after this sample is extracted. We assume that this sample might be logically taken from a shaft of 8 feet inside diameter, sunk 50 feet into bedrock, with one or more 8' x 10' drifts run from the shaft bottom for a total of about 100 feet.

We understand that the location is in or near a part of the "big swamp" and that ground is likely to be saturated from surface down; pumped water might have to be piped some distance to prevent return. We have assumed that work might be scheduled to avoid interference from floods.

In estimating, we have assumed that a good access road would be provided, but that the contractor would furnish all labor, supervision, equipment, material and supplies, including power, and pay all obligatory taxes and insurance, as well as his overhead and profit for the work, in cluding mobilization and cleanup.

We have considered three possible means of undertaking the work:

A. By dewatering from possibly four large churn drill holes with deep well pumps. There is an element of uncertainty in this that could be reduced by study of the overburden. Information gained in pumping might be of value in formulating mining plans and estimates.

B. By drop shaft. We consider this method subject to some undertainty until seal has been made to bedrock. As in "A", a further study of the overburden would help reduce the uncertainty.

August 2, 1951

Foley Brothers, Inc. — #2

C. By freezing the overburden and keeping it frozen till work in bedrock is complete. We regard this method as entirely applicable.

For work under these three methods, our estimates are as follows:

	A. Dewatering	B. Drop Shaft	C. Freezing
Cost through 150' Overburden	$176,000	$157,500	$120,000
Cost Sinking 50' and Drifting 100'	63,000	63,000	63,000
Total Cost	239,000	220,500	183,000
Total Time	6.5 months	5.5 months	6.0 months

The above estimates are based on present wages, prices and availability of men and equipment, on our general knowledge of the area concerned, and they were prepared om very short notice. E. J. Longyear Company reserves freedom of action in any future negotiations concerning this work.

While we are not familiar with all requirements of this work, we cannot help wondering if a sample of, say, 100 tons, taken from five or six 18" holes, might be satisfactory. We think that good core samples of bedrock might be taken by shot drill while overburden would be penetrated by churn drill. Samples could, of course, be taken at various points as desired, and the holes might later be used in initial dewatering prior to mining. We think the cost of this work might be in the order of $90,000.00.

I hope this information will be of use to you, and remain

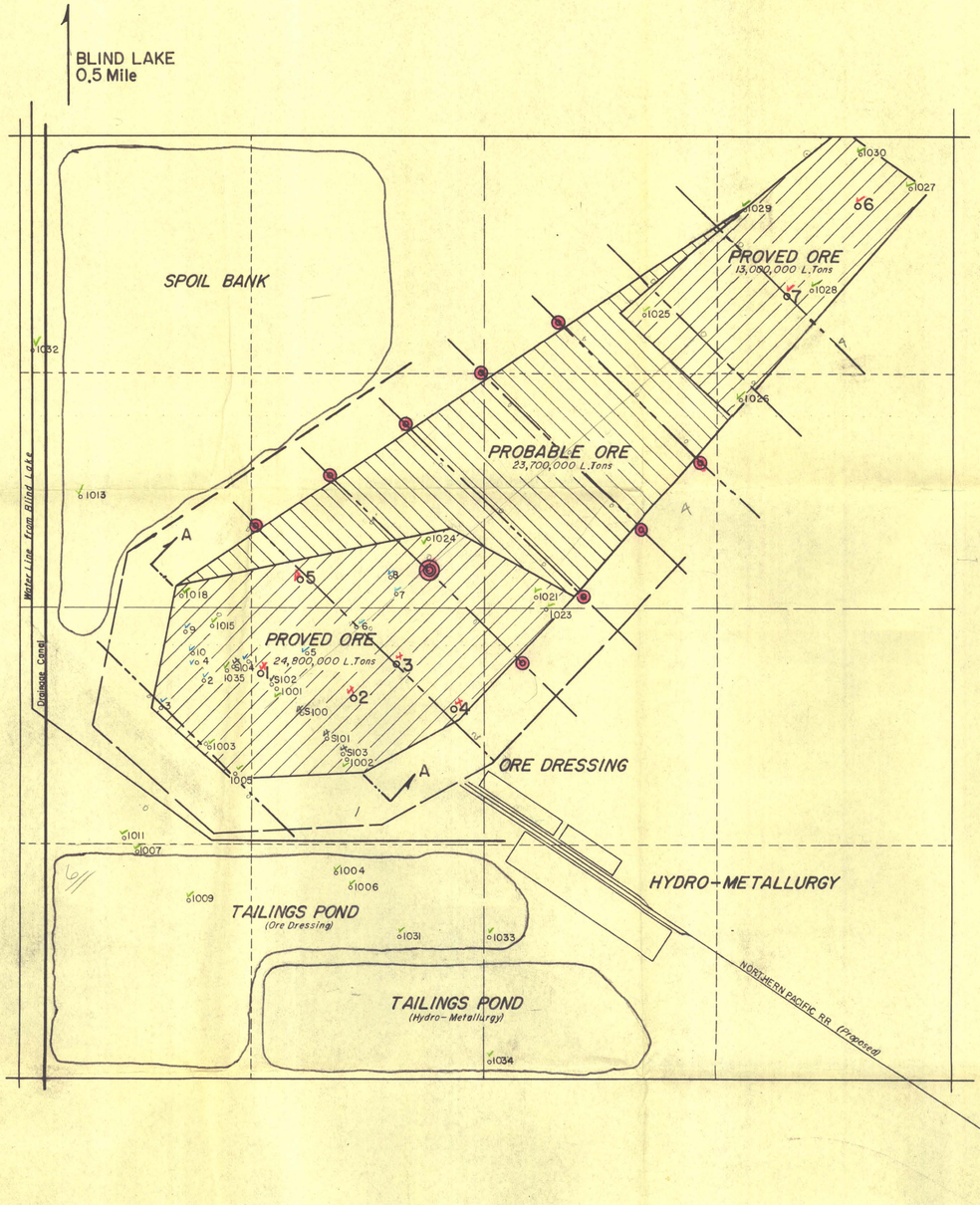
Sincerely,

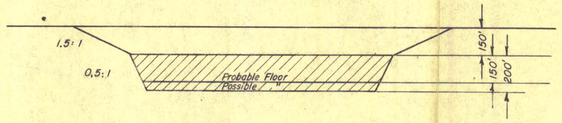
E. J. LONGYEAR COMPANY

R. L. Loofbourow, Manager,
Mine Contracting Department

RLL;es

c.c. D. M. Davidson





Sec. A-A

Legend

✓o 1, etc.	Churn drill holes by M.P. Botsford
✓o 1001, etc.	" " " " Crosby Exploration Co.
✓o S100, etc.	" " " " M. A. Hanna Coal & Ore Co.
✓o 1, etc.	Diamond core-drill holes by U. S. B. M.
◎	*Proposed drill holes*
◎	*Proposed exploration shaft*

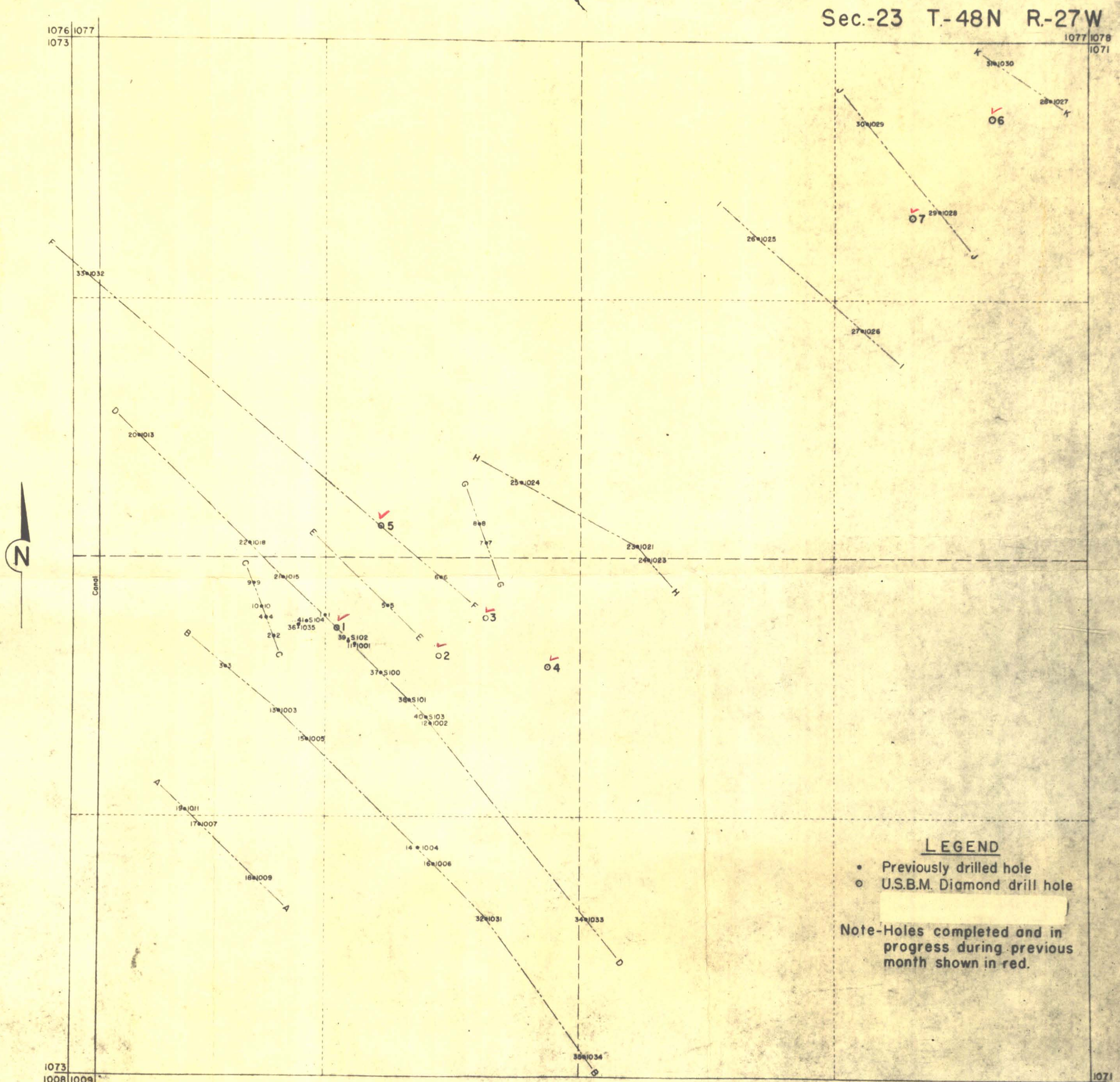
THE UTAH CONSTRUCTION COMPANY
and ASSOCIATES

PROPOSED MANGANESE MINE
Sec-23 T-48N R-27W
Aitkin Co., Minn.

Scale: 1" = 400'
Drawn by C.T.E.B.

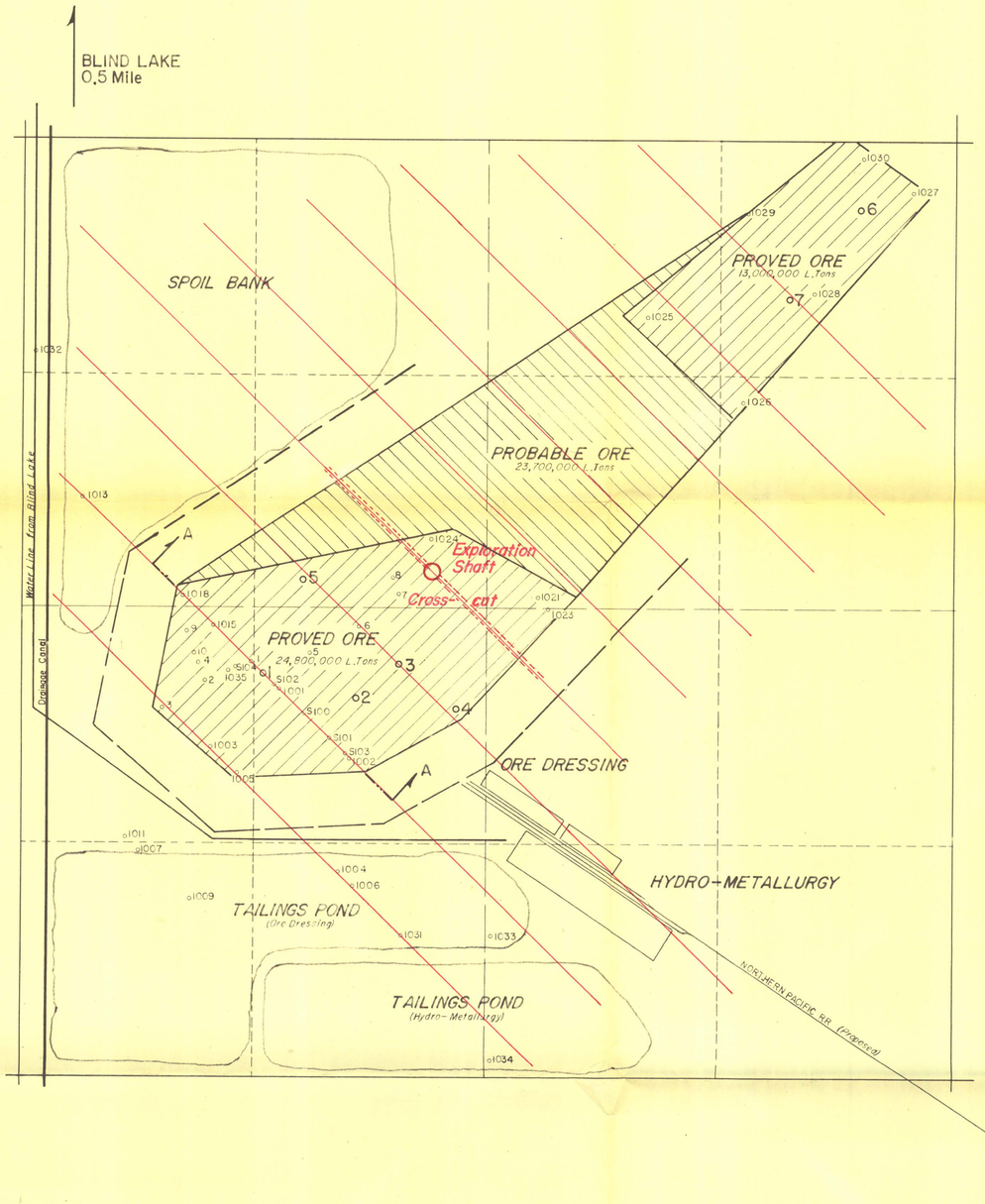
Date *28 May 1951*

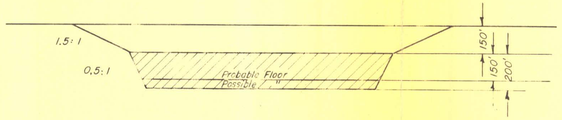
E 2



MINNESOTA
Aitkin County
Cuyuna Range Development Project-Location of drill holes.

1072
Section Reference





Sec. A-A

Legend

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- ○ S100, etc. " " " " M. A. Hanna Coal & Ore Co.
- O 1, etc. Diamond core-drill holes by J. S. B. M.

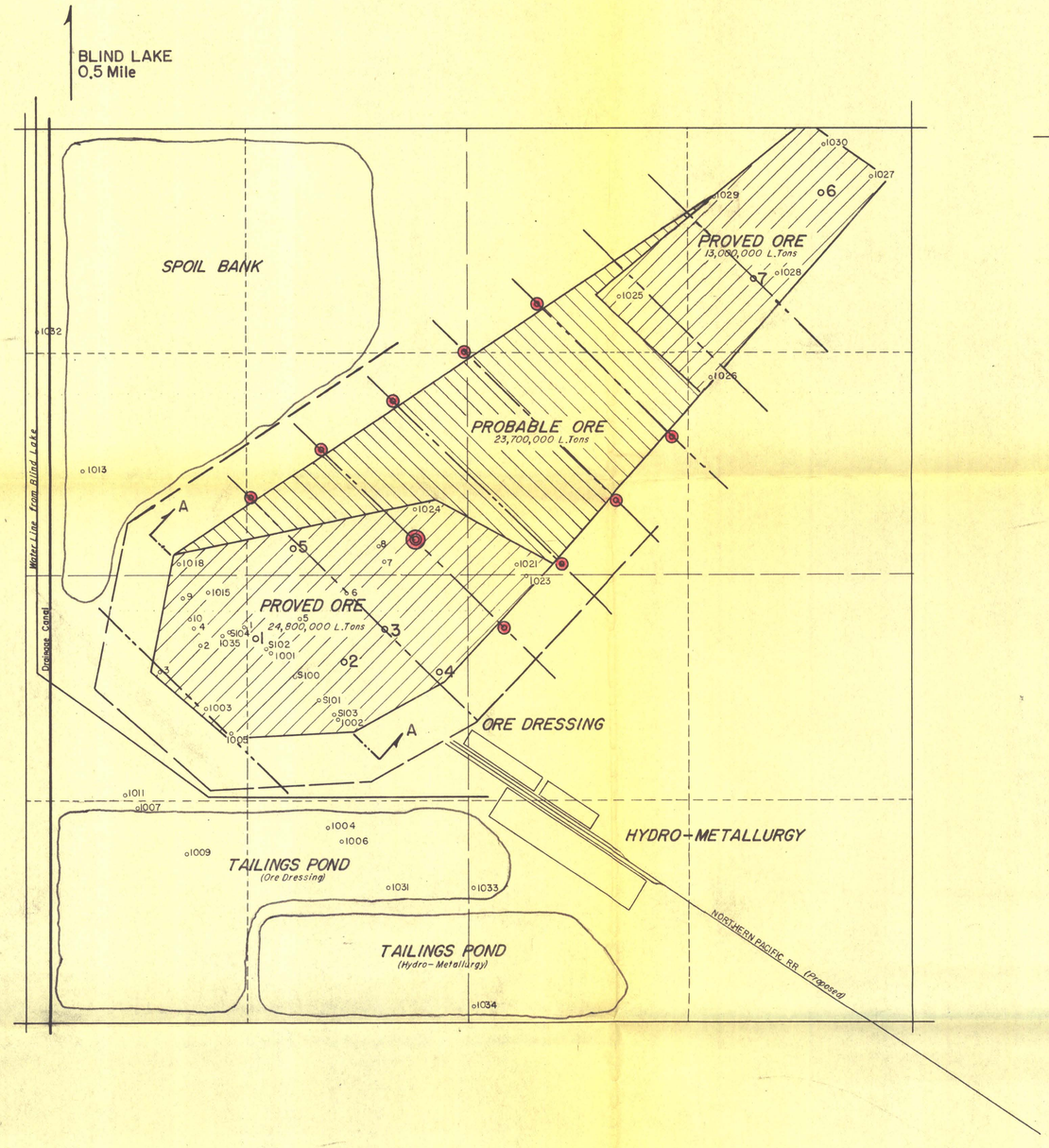
Red lines indicate proposed drilling sections

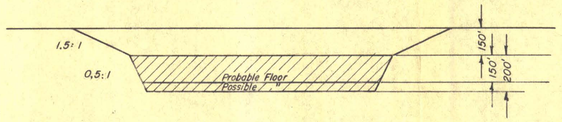
PROPOSED MANGANESE MINE
Sec-23 T-48N R-27W
Aitkin Co., Minn.

Scale: 1" = 400'

Date 28 May 1951

E 2





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- O 1, etc. — Diamond core-drill holes by U. S. B. M.
- *Proposed drill holes*
- *Proposed exploration shaft*

THE UTAH CONSTRUCTION COMPANY
and ASSOCIATES

PROPOSED MANGANESE MINE
Sec-23 T-48N R-27W
Aitkin Co., Minn.

Scale: 1" = 400'	Date 28 May 1951
Drawn by C.T.E.B.	E 2